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FOREWORD

Research Synergy Foundation is a digital social enterprise platform that focuses on developing Research Ecosystem towards outstanding global scholars. We built collaborative networks among researchers, lecturers, scholars, and practitioners globally for the realization of knowledge acceleration. We promote scientific journals among countries as an equitable distribution tools of knowledge. We open research collaboration opportunities among countries, educational institutions, organizations and among researchers as an effort to increase capabilities.

Known as a catalyst and media collaborator among researchers around the world is the achievement that we seek through this organization. By using the media of International Conference which reaches all researcher around the world we are committed to spread our vision to create opportunities for promotion, collaboration and diffusion of knowledge that is evenly distributed around the world

Our Vision:

As global social enterprise that will make wider impact and encourage acceleration quality of knowledge among scholars.

Our Mission:

First, developing a research ecosystem towards outstanding global scholars. Second, Promoting scientific journals among countries as an equitable distribution tools of knowledge. Third, opening research collaboration opportunities among countries, educational institutions, organizations and among researchers as an effort to increase capabilities. Fourth, creating global scientific forum of disciplinary forums to encourage strong diffusion and dissemination for innovation.

https://www.researchsynergy.org

With a history that spans more than two decades in the education sector, Multimedia University has undergone countless changes, yet has always maintained its vision and mission to achieve the highest standards of performance in teaching and in the services we offer students, staff and the community.

VISION:

Transforming society through innovation

MISSION:

To inquire, inspire and innovate (I3)

- Education: Commit to learner-centred and life-long learning
- Research: Embrace intellectual curiosity to solve real-world problems
- Entrepreneurship: Create value to the economy and society through technology

QUALITY POLICY

Multimedia University (MMU) as an educational institution is committed to achieve higher customer satisfaction in support of its vision by continuously improving an effective quality management system that complies with the internal and external requirements.

MMU CORE VALUES

RESPECT AND CARE

- Propagate team spirit and co-operation among staff
- Practise mutual respect and courtesy in all our dealings and interactions
- Demonstrate understanding and open-mindedness of all concerns, comments, ideas and feedback received

UNCOMPROMISING INTEGRITY

- Be sincere and practise honesty in all of our actions, statements and interpersonal relations with other individuals
- Demonstrate trustworthiness in carrying out all our duties and responsibilities
- Approach our work with full dedication
- Treat all our stakeholders with fairness

CUSTOMER CENTRICITY

- Deliver quality services in a timely manner
- Keep all our commitments
- Be responsive
- Communicate with conviction and professionalism
- Friendly services

INNOVATIVENESS

- Creative exploration in teaching and research
- Introduce new ideas to improve services, products, processes, and procedures

https://www.mmu.edu.my

Our Vision

Canadian University Dubai is committed to providing students with an international academic experience, guided by the highest educational and corporate ethics, adding value to the personal and professional lives of its graduates, and the communities in which we serve.

Our Mission

Canadian University Dubai promotes Canadian perspectives in learning, research and application, grounded in an appreciation and respect for the diverse culture and values of the UAE.

Goals and Objectives

- Goal 1:
    - To create and maintain an environment conducive to continual learning and improvement while continuously evaluating all aspects of CUD operations to ensure relevance and excellence.
- Objectives:
    - To provide opportunities for students to enhance their classroom experience through the use of multi-media and online resources.
    - Through the Office of Institutional Research and Planning, continuously evaluating our performance as a teaching and learning organization and the satisfaction of students and staff with the performance of the University.
    - To use systematic planning, based on evidence, to develop the University both operationally and strategically.
- Goal 2:
    - To adopt and show the enthusiasm and contribution of all staff and students and to support the ambitions of all by providing them with both academic excellence and the practical experience required for career success.
- Objectives:
    - 2.1 To provide for excellence in teaching as measured by student and peer evaluation.
    - 2.2 To provide opportunities, where relevant, for job placements for projects and other activities.
    - 2.3 To engage the business, government and not for profit organizations within Dubai with the work of the University.

- Goal 3:
    - To generate an atmosphere of dignity and mutual respect while encouraging scholarly debate and applied research.
- Objectives:
    - 3.1 To develop a focused Research Center which conducts applied research and engages both staff and students in the pursuit of scholarly activity.
    - 3.2 To hold periodic open and public lectures to encourage debate grounded in academic rigor on issues of concern to the region.
    - 3.3 To develop, with students and staff, a code of conduct that is honored and respected in the day to day work of the University.
- Goal 4:
    - To accept accountability and value the input of all stakeholders particularly in our operation as a portal to Canadian education, and so make CUD the University of Choice in our target market and simultaneously an employer of choice for all academic, management and support staff.
- Objectives:
    - 4.1 To have a clear strategy for collaboration and co-operation with Canadian post-secondary educational institutions and to develop collaborative agreements which reflect this strategy.
    - 4.2 To systematically collect data from stakeholders, internal and external, concerning the performance of the University, its strategic brand position and its opportunities for growth.
    - 4.3 To continue to grow the base of programs and student numbers so as to fulfil the mission and deliver the Strategic Plan of the University.
- Goal 5:
    - To account for the needs of all internal and external stakeholders by securing sufficient and relevant resources that are available for the achievement of all strategic and operational goals, thus enhancing the sovereignty of the University as an independent institution of higher education.
- Objectives:
    - 5.1 To undertake systematic resource planning for teaching requirements, space requirements, library and student service requirements and for information technology, and to use these plans as a basis for budget development and strategic planning.
    - 5.2 To seek to secure our status as a self-financing organization at the earliest opportunity, using new investments for expansion and development.

https://www.cud.ac.ae

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ORGANIZING COMMITTEE

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Assoc. Prof. Dr. Mardeni bin Roslee
Multimedia University

Co - General Congress Chair:

Dr. Hendrati Dwi Mulyaningsih
Research Synergy Foundation

Honorary Secretary:

Dr.Katrina D Dambul

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Universiti Utara Malaysia

GENERAL CONGRESS CHAIR MESSAGE

We are delighted to welcome you to Digital Futures International Congress (DIFCON 2021) by Multimedia University (MMU), Research Synergy Foundation (RSF), and Canadian University, Dubai (CUD) that held virtually on June 21-23, 2021.

This conference not only give you global forum to share and exchange idea, research, and work. But also, provide wider network and research ecosystem for further collaboration and projects. We are glad to share this good opportunities in the scientific community, that will be offered only for all participants who participate in the conference.

It has been our privilege to convene this conference. Our sincere thanks, to the conference organizing committee; to the Program Chairs for their wise advice and brilliant suggestion on organizing the technical program and to the Program Committee for their through and timely reviewing of the papers. Recognition should go to the Local Organizing Committee members who have all worked extremely hard for the details of important aspects of the conference programs and social activities.

We welcome you to this conference and hope that this year's conference will challenge and inspire you, and result in new knowledge, collaborations, and friendships.

Best regards,

Assoc. Prof. Ts. Dr. Mardeni Bin Roslee

General Congress Chair of DIFCON 2021

GENERAL CONGRESS CHAIR

Assoc. Prof. Ts. Dr. Mardeni Bin Roslee

Associate Professor Ts.Dr.Mardeni Roslee is a Deputy Director of Research Management Centre and an academician under Faculty of Engineering, Multimedia University, Cyberjaya, Malaysia. He is a President of MMU Mesra and Chairman of Centre of Wireless Technology, Multimedia University. At international level, he was a Chairman of IEEE Malaysia in Comsoc/VTS and Vice-Chair of Malaysian Radar & Navigations Interest Group (MyRaN ig), Malaysian Society for Engineering & Technology (MY SET). He is the Chief Executive Officer, main founder of Armada Smart Tech MR Sdn Bhd. He is a registered Chartered Engineer with Engineering Council United Kingdom, IET, UK. His current research interests are 5G/6G telecommunication, D2D, satellite, Internet of Things and radar communication. He has been invited at international conference as an invited speaker at Thailand, China, Australia, Korea, Indonesia, Singapore, Japan, French, United Kingdom, Spain, Canada, New Zealand and Romania. He has hold some international conference committees such as General Chair of DIFCON21, General Chair of IEEE ICECCE21, General Chair of IEEE MICC21, General Chair of ISTT20 and Conference Chair of IEEE MICC2019. He is the International keynote speaker for GECOST21, WWRF21, ICECCE21, IAICDE-20, ICECCE20, IEEE SOFTT19, I3CPE'19 and MyTENS16. His contributions to academic and the engineering professional over the years have earned him recognitions nationally and internationally, he has awarded 45 international/local awards including the University Excellent Researcher Award for 2016 and 2018, VTS Chapter of the Year Award 2017 from Canada, Excellence in European Creativity Special Award 2018 from Romania, World Invention Special Award 2019 from WIIPA, Outstanding Researcher Award 2020 from VTS, USA and awarded Top Research Scientist in Malaysia 2020 from Academy of Science Malaysia (ASM).

CO - GENERAL CONGRESS CHAIR

Dr. Hendrati Dwi Mulyaningsih

Dr. Hendrati Dwi Mulyaningsih is the chairman and founder of Research Synergy Foundation that has shown great commitment on creating Global Network and Research Ecosystem. This GNR ecosystem has been developing since 2017 up to the present and having increasing numbers of the member up to more than 15.000 from all around the globe. Her passion in how to create impact and co creation value among all the stake holder of RSF has made her focus on upholding integrity in the scientific process through enhancement of RSF's support-support system as like Reviewer track, Scholarvein, Research Synergy Institute and RSFPress. Thus, her work in this area has made her as the Nominee of Impactful Leadership Awards from Tallberg Foundation Swedia 2019.

As lecturer, she has been working in the University since 2008 – at present in Indonesia as assistant professor and she hold her Doctoral Science of Management graduated from School of Business and Management Institute of Technology Bandung (SBM-ITB) and she has strong interest to her research project as well as her research field in Social entrepreneurship, Social Innovation and Knowledge Management.

As researcher, her work studies and research on this research field made her being invited as reviewer in many reputable Scopus and WOS indexed journals and also as keynote speaker in many International Conferences in Philippines, Thailand, Malaysia, Indonesia, Australia, Japan and US . She also has shown her great passion on writing her research study into some books chapter , papers and contemporary scientific articles that has already been published in Springer, Emerald, Taylor and Francis and in many reputable international journals. The terrific association between her professional experiences as researcher, lecturer, the certified Trainer & Coach combined with her wider horizon on networking in the research area made her establish the strong commitment on having global learning platform to accelerate knowledge through many workshops and research coaching in Research Synergy Institute as one of RSF's support system.

WELCOMING SPEAKER

YBhg. Prof. Dato' Dr. Mazliham Mohd. Su'ud

President, Multimedia University

OPENING SPEAKER

Yang Berhormat Datuk Haji Ahmad Amzad Hashim

Deputy Minister
Ministry of Science, Technology and Innovation
Malaysia

KEYNOTE SPEAKER

YBhg.Prof.Ts.Dr.Mohd.Mustafa Al Bakri Abdullah

Universiti Malaysia Perlis

KEYNOTE SPEAKER

Prof. Dr. Severin Hornung

Severin Hornung is a senior lecturer and research scholar at the Institute of Psychology of the University of Innsbruck in Austria. After degrees in Industrial Engineering and Management and Social Science of Technology, he received his PhD in 2005 with summa cum laude at the Chair of Psychology of the Technical University Munich. In 2017, the University of Innsbruck awarded him a postdoctoral degree with full teaching permit for the field of psychology. Previous academic positions and visiting appointments included Germany, United Kingdom, Hong Kong, and United States. His research interests evolve around the neoliberal transformation of organizations, work, and employment, and its psychological, social, and ethical consequences, including societal and ecological inequality and unsustainability, as drivers of the need for fundamentally critical and radical humanist paradigms in organizational scholarship. He is a co-founder of the Innsbruck Group on Critical Research in Work and Organizational Psychology (I-CROP), involved in several related professional initiatives and activities, on the editorial board of Human Relations, and guest editor for Applied Psychology.

CONFERENCE PROGRAM

Day 1 - Monday, June 21st, 2021

Time (UTC+8)			*Dur'*	*Activity*
8:50	-	9:00	0:10	**Participant Login and Join Virtual Conference by ZOOM**
9:00	-	9:10	0:10	Welcome Address and Conference Publication Announcement by MC
9:10	-	9:20	0:10	Doa Recitation Ustaz Mohd Toha bin Mohamad@ Mohd Hasan
9:20	-	9:30	0:10	**Welcome Remarks and Introduction of DIFCON** Assoc. Prof. Ts. Dr. Mardeni Bin Roslee Multimedia University, General Congress Chair of DIFCON
9:30	-	9:40	0:10	**Welcoming Speech** YBhg. Prof. Dato' Dr. Mazliham Mohd. Su'ud President, Multimedia University
9:40	-	9:50	0:10	**Opening Speech** Yang Berhormat Datuk Haji Ahmad Amzad Hashim Deputy Minister Ministry of Science, Technology and Innovation Malaysia
9:50	-	10:00	0:10	**DIFCON & MMU Montage** **Token of Appreciation for VVIP Speakers** **E-Group Photo**
10:00	-	10:05	0:05	Break

Time (UTC+8)			*Dur'*	*Activity*
10:05	-	10:20	0:15	**MMU Introduction** Ybhg. Prof. Ir. Dr. Hairul Azhar Bin Abdul Rashid Vice President, Research, Industrial Collaborations And Engagement Multimedia University
10:20	-	10:35	0:15	**Global Research Ecosystem Introduction** Dr. Hendrati Dwi Mulyaningsih Founder & Chairman of Research Synergy Foundation
10:35	-	10:50	0:15	**CUD Introduction** Dr. Mohammed Djeddi Vice President, Academic Affairs, Canadian University Dubai
10:50	-	10:55	0:05	Token of Appreciation for Representatives
10:55	-	11:00	0:05	Break
11:00	-	11:45	0:45	**Keynote Speaker** YBhg.Prof.Ts.Dr.Mohd.Mustafa Al Bakri Abdullah Universiti Malaysia Perlis
11:45	-	12:30	0:45	**Keynote Speaker** Prof. Dr. Severin Hornung University of Innsbruck, Austria
12:30	-	12:35	0:05	Token of Appreciation for Keynote Speakers

Time (UTC+8)			*Dur'*	*Activity*
12:35	-	12:40	0:05	**Announcement of Parallel Conference:** MECON, CLESS, CITIC, ICLD, ICCM, ICTIM
12:40	-	13:00	0:20	Break & Go To Parallel Rooms
Parallel Room				**MECON (1 room); ICTIM (1 room); ICLD (1 room); ICCM (1 room); CLESS (1 room); CITIC (1 room).**
13:00	-	16:30	3:30	**Keynote & Online Presentation Session**
Main Room				*https://zoom.us/j/94857652943?pwd=aUtXdnUrS2NpTmVWV09kWjYxb1Rvdz09* *Meeting ID: 948 5765 2943* *Passcode: difcon2021*
16:30	-	16:40	0:10	**Awarding Ceremony** Best Presentation Session Chair
16:40	-	16:45	0:05	**Closing Speech** Ybhg. Prof. Ir. Dr. Hairul Azhar Bin Abdul Rashid Vice President, Research, Industrial Collaborations And Engagement Multimedia University

Day 2 - Tuesday, June 22nd , 2021

Time (UTC+8)			*Dur'*	*Activity*
Main Room *https://zoom.us/j/94857652943?pwd=aUtXdnUrS2NpTmVWV09kWjYxb1Rvdz09* *Meeting ID: 948 5765 2943* *Passcode: difcon2021*				
8:50	-	9:00	0:10	**Participant Login and Join Virtual Conference by ZOOM**
9:00	-	9:05	0:05	Welcome Address and Conference Publication Announcement by MC
9:05	-	9:10	0:05	**Welcome Remarks** Dr. Yang Chik binti Adam ICLD Conference Chair
9:10	-	9:15	0:05	**Welcome Remarks** Dr. Sareen Kaur Bhar CLESS Conference Chair
9:15	-	9:20	0:05	**Welcome Remarks** Dr. Fauzan bin Mustaffa ICCM Conference Chair
9:20	-	9:25	0:05	Token of Appreciation for Conference Chairs of ICLD, CLESS, ICCM.
9:25	-	9:30	0:05	E-Group Photo

Time (UTC+8)			*Dur'*	*Activity*
Parallel Room				**MECON (1 room); ICTIM (1 room); ICLD (1 room); ICCM (1 room); CLESS (1 room); CITIC (1 room).**
9:30	-	16:30	7:00	**Keynote & Online Presentation Session**
Main Room *https://zoom.us/j/94857652943?pwd=aUtXdnUrS2NpTmVWV09kWjYxb1Rvdz09* *Meeting ID: 948 5765 2943* *Passcode: difcon2021*				
16:30	-	16:40	0:10	**Awarding Ceremony** Best Presentation Session Chair
16:40	-	16:45	0:05	**Closing and Announcement** Dr. Farida Canadian University Dubai

Day 3 - Wednesday, June 23rd , 2021

Time (UTC+8)			*Dur'*	*Activity*
Main Room *https://zoom.us/j/94857652943?pwd=aUtXdnUrS2NpTmVWV09kWjYxb1Rvdz09* *Meeting ID: 948 5765 2943* *Passcode: difcon2021*				
8:50	-	9:00	0:10	**Participant Login and Join Virtual Conference by ZOOM**
9:00	-	9:05	0:05	Welcome Address and Conference Publication Announcement by MC
9:05	-	9:10	0:05	**Welcome Remarks** Assoc. Prof. Dr. Haw Su Cheng CITIC Conference Chair
9:10	-	9:15	0:05	**Welcome Remarks** Prof. Dr. Mohamad Yusoff bin Alias MECON Conference Chair
9:15	-	9:20	0:05	**Welcome Remarks** Dr. Arnifa binti Asmawi ICTIM Conference Chair
9:20	-	9:25	0:05	Token of Appreciation for Conference Chairs of CITIC, MECON, ICTIM.
9:25	-	9:30	0:05	E-Group Photo

Time (UTC+8)			*Dur'*	*Activity*
Parallel Room				**MECON (2 rooms); ICTIM (2 rooms) ICCM (1 room); CITIC (3 rooms).**
9:30	-	16:30	7:00	**Keynote & Online Presentation Session**
Main Room *https://zoom.us/j/94857652943?pwd=aUtXdnUrS2NpTmVWV09kWjYxb1Rvdz09* *Meeting ID: 948 5765 2943* *Passcode: difcon2021*				
16:30	-	16:40	0:10	**Awarding Ceremony** Best Paper Best Presentation Session Chair
16:40	-	16:45	0:05	**Closing and Announcement** Ybhg. Prof Ir. Dr. Zulfadzli Bin Yusoff Director Research Management Centre Multimedia University
16:45	-	17:00	0:15	**DIFCON Closing Ceremony** Multimedia University Research Synergy Foundation Canadian University Dubai

FUTURE EVENT

July 6, 2021 | Virtual Conference

3rd International Conference on Islamic Education Studies and Social Science (3rd ICISS)

http://www.icissconference.com/index.php/3rd-iciss/

July 28, 2021 | Virtual Conference

2nd International Conference on Management, Education, and Social Science (2nd MESS)

http://messconference.com/2nd-mess/

August 11, 2021 | Virtual Conference

5th International Conference on Interdisciplinary in Business, Economy, Management, and Social Studies (5th IBEMS)

https://www.ibemsconference.com/index.php/ibems-5th/

August 12-13, 2021 | Virtual Conference

International Conference on Governance Risk-management and Compliance (ICGRC)

https://www.icgrc.com/

August 30, 2021 | Virtual Conference

7th International Conference on Business, Economy, Management and Social Studies Towards Sustainable Economy (7th BEMSS)

http://www.bemssconference.com/index.php/7th-bemss/

September 8-9, 2021 | Virtual Conference

5th International Conference Postgraduate School

http://icpsunair.com/

September 14, 2021 | Virtual Conference

2nd International Conference on Language, Education and Teaching Research (2nd ICLET)

http://www.icletconference.com/index.php/2nd-iclet/

September 25-26, 2021 | Virtual Conference

Bandung International Conference on Medical and Health Sciences (BICMHS)

https://bicmhs.com

October 4, 2021 | Virtual Conference

LPPM UPN "VETERAN" Yogyakarta Conference Series 2021 – Economic and Business, Political and Social Science, & Engineering and Science

https://upnconfeseries.com/2021-2/

October 5-7, 2021 | Virtual Conference

7th Singapore International Conference on Management, Business, Economic and Social Science (7th SIMBES)

http://www.simbesconference.com/7th-simbes/

November 8, 2021 | Virtual Conference

6th International Conference on Interdisciplinary Research on Education, Economic Studies, Business and Social Science (6th RESBUS)

http://resbusconference.com/index.php/6th-resbus/

December 6, 2021 | Virtual Conference

7th Japan International Business and Management Research Conference (7th JIBM)

http://www.jibmconference.com/index.php/7th-jibm/

December 14 - 15, 2021 | Virtual Conference

The International Halal Science and Technology Conference 2021 (IHSATEC): 14th Halal Science and Business (HASIB)

https://www.ihsatec.com

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MECON 2021

Multimedia University Engineering Conference

Virtual Conference
June 21-23, 2021

Supported by:

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Website, Design and Publicity

Chung GwoChin

Publication Chair

Foo Yee Loo / You Ah Heng / Cheang Pei Ling / Yap Yee Ling

CONFERENCE CHAIR MESSAGE

We are delighted to welcome you to Multimedia University Engineering Conference (MECON 2021) by Multimedia University (MMU), Research Synergy Foundation (RSF), and Canadian University, Dubai (CUD) that held virtually on June 21-23, 2021.

The Multimedia University Engineering Conference 2021 (MECON 2021) aims to bring together related research scholars, educators, practitioners, policy makers, enthusiasts, fellow students, and industries to share and exchange their research experiences and results on all aspects of engineering technologies from various perspectives, disciplines and fields. It also offers an interdisciplinary platform for all stakeholders to present and discuss the most recent trends, innovations, and concerns as well as practical challenges encountered, and solutions adopted in the realm of engineering technologies. This conference is being co-organised by the Faculty of Engineering (FOE) and Faculty of Engineering and Technology (FET), Multimedia University.

It has been our privilege to convene this conference. Our sincere thanks, to the conference organizing committee; to the Program Chairs for their wise advice and brilliant suggestion on organizing the technical program and to the Program Committee for their through and timely reviewing of the papers. Recognition should go to the Local Organizing Committee members who have all worked extremely hard for the details of important aspects of the conference programs and social activities.

We welcome you to this conference and hope that this year's conference will challenge and inspire you, and result in new knowledge, collaborations, and friendships.

Best regards,

Prof Dr. Mohamad Yusoff bin Alias

Conference Chair of MECON 2021

CONFERENCE CHAIR

PROF DR. MOHAMAD YUSOFF BIN ALIAS

Mohamad Yusoff Alias obtained the Bachelor of Science in Engineering (Electrical Engineering) degree from the University of Michigan, Ann Arbor, in May 1998. He then received his Ph.D. degree in December 2004 from the School of ECS, University of Southampton in the United Kingdom. He is currently a Professor at the Faculty of Engineering, Multimedia University in Malaysia. His research interests cover the field of wireless communications especially in OFDM, multiple antenna system, multiuser detection, genetic algorithms in communications, multimedia applications and visible light communications.

Co - CONFERENCE CHAIR

ASSOC PROF DR. ROSLI BIN BESAR

Dr. Rosli Bin Besar received the B.Eng. (Hons) degree in Electronic Engineering and M.Sc from USM, in 1990 and 1993 respectively. and Ph.D. degrees from Multimedia University, in 2004. Since 1997, he has been attached to the Multimedia University where his research interest are in signal and image processing.

KEYNOTE SPEAKER

PROFESSOR DR. ROSALINA ABDUL SALAM

Rosalina Abdul Salam is a professor at the Faculty of Science & Technology, Universiti Sains Islam Malaysia (USIM). She received her B.Sc. (Hons.) degree in Computing in 1992 from Leeds Metropolitan University, United Kingdom. She started her career as a System Analyst at Intel Penang in 1992. She returned to United Kingdom in 1995 to further her studies. She obtained her Master of Science Degree in Engineering in Advanced Software Engineering from Sheffield University in 1997 and PhD in Computer Science from University of Hull in 2001. She became a lecturer at the Universiti Sains Malaysia (USM) in 2001, a senior lecturer in 2005 and an Associate Professor in 2007. She becomes a Professor in Computer Science at Universiti Sains Islam Malaysia (USIM) in 2010. She has served as a chairperson for software engineering program at the School of Computer Sciences, USM, Director of Research Management Centre, USIM and Director of Islamic Science Institute, USIM. Her current research interests include Artificial Intelligence, Image Processing, Speech Processing, Pattern Recognition and Interactive Digital Media Applications in Education. She has published more than 100 papers in journals and conferences. She has supervised and co-supervised several numbers of Ph.D. dissertations and M.Sc. theses.

KEYNOTE SPEAKER

PROF. DR. ZAHRILADHA BIN ZAKARIA

Zahriladha Zakaria is a professor at Faculty of Electronic & Computer Engineering University Teknikal Malaysia Melaka (UTeM). He received the B. Eng. and M. Eng. in Electrical and Electronic Engineering from the Universiti Teknologi Malaysia in 1998 and 2004 respectively, and the PhD degree in Electrical & Electronic Engineering from The Institute of Microwaves and Photonics (IMP), University of Leeds, United Kingdom in 2010. From 1998 to 2002, he was with STMicroelectronics, Malaysia where he worked as Product Engineer. He is currently a Professor at Microwave Research Group (MRG), Faculty of Electronic & Computer Engineering, University Teknikal Malaysia Melaka (UTeM), where he teaches Microwave Engineering, Antenna and Propagation, Electronic System, Communication Principles, Wireless Communications and Signal Processing. His research interests include variety of microwave devices development such as planar and non-planar microwave filters, resonators, amplifiers and antennas. He also investigates energy harvesting, sensor and photonics for interdisciplinary applications. He has published more than 300 scientific papers in journals, proceedings and book-chapters. He holds 8 intellectual property rights and he has won several awards including gold medal during several research and innovation exhibitions at the national and international level, such as the UTeMEX 2012, 2013 & 2015, Malaysia Technology Expo (MTE 2012-2014 and 2016), ITEX 2016 & 2017, International Trade Fair Ideas Inventions New Products (iENA 2012) in Nuremberg, Germany, Seoul International Invention Fair (SiiF 2013, 2016, 2017 & 2019) in Seoul, Korea. Dr. Zakaria is an active reviewer for prominent journals such as IEEE Transactions on Microwave Theory and Techniques (MTT), IEEE Sensor, IEEE Access, IEEE Microwave and Wireless Components Letters (MWCL) and etc.

SESSION CHAIRS

DR. SITI AZLIDA BINTI IBRAHIM @ GHAZALI

Siti Azlida is a researcher and an academician, working in the field of optical sensors. She has active research work in the area of optical fiber sensors, optical chemical sensors, gas sensors, micro/nano materials-based sensors, and dosimetry.

Mr. Ronnie Bituin

Ronnie Bituin is a developer and researcher in the Philippines where he grew up with. He is good at one thing and that is helping an organization to grow by supercharging them with the latest technology. After his graduation from college, Mr. Bituin has been invited by multiple student body in the country to discuss the latest trend in multimedia computing. Apart from speaking and doing demo of the latest technology, he is also very active in contributing to our academia by publishing their findings in reputable journals abroad. Currently, he spearheads the research and development of the institution.

Engr. Christopher C. Mira

Engr. Mira is a graduate of B.S. Industrial Engineering and has been a Master in Industrial Engineering and Management. He has been with the university as a fulltime assistant professor since November 2006 initially handling major Industrial Engineering subjects. Later in 2017, he has been given subjects in Quality Management for BS Accountancy and BS Business Administration Major in Human Resource Management. His involvement in research has been commended during his being a member of the University Research Group for Engineering, Architecture and Technology Colleges. He has presented various research papers in the local and international settings likewise, invited as panelist and session chair in various research presentations. He is also regularly invited by some business establishments reference to their quality and performance evaluation. He is presently the adviser of the Phil. Inst. of Ind'l. Engineers (PIIE) PUP Binan Chapter and former adviser of the Manila Innovators and Dev't. Society (MINDS). Engr. Mira is a member of several groups involving research peer evaluation, scholarly research.

Ir. Ms. Siva Priya A/P Thiagarajah

Ir. Ms. Siva Priya (PEPC, MIEM) is lecturer with the Faculty of Engineering, at Multimedia University (MMU) Cyberjaya, Malaysia. She obtained her B.Eng in Electronics (Telecommunications) from Universiti Teknologi Malaysia, Skudai, in 2004 and M.Eng Telecommunications from Multimedia University in 2011. She worked with MEASAT Satellite Systems from 2004 until 2011. Her tenure with MEASAT provided vast industrial exposure to VSAT & earth station implementation and testing, customer support, interference resolution, spectrum management, satellite procurement, and international frequency regulatory coordination. She is currently pursuing her Ph.D. in Engineering in Multimedia University in the field of radio resource management in Heterogeneous Wireless Networks (HetNet). Her research domain includes sustainable power supply systems, 4G/5G radio resources optimization, radio channel propagation modelling and smart biomedical solutions. She is a certified HRDF Trainer under the CIT-Train-the-Trainer and trains in soft skills, workplace safety and engineering education.

D Dr. Ahmed A. Elngar (Ph.D)

Dr. Ahmed A. Elngar is Associate Professor of Computer Science at the Faculty of Computers and Artificial Intelligence, Beni-Suef University, Egypt. Dr. Elngar is the Founder and Head of Scientific Innovation Research Group (SIRG). Dr. Elngar is a Director of the Technological and Informatics Studies Center (TISC), Faculty of Computers and Artificial Intelligence, Beni-Suef University. Dr. Elngar has more than 55 scientific research papers published in prestigious international journals and over 25 books covering such diverse topics as data mining, intelligent systems, social networks and smart environment. Dr. Elngar is a collaborative researcher is a member in Egyptian Mathematical Society (EMS) and International Rough Set Society (IRSS). His other research areas include Internet of Things (IoT), Network Security, Intrusion Detection, Machine Learning, Data Mining, Artificial Intelligence. Big Data, Authentication, Cryptology, Healthcare Systems, Automation Systems. Dr. Elngar is an Editor and Reviewer of many international journal around the world. Dr. Elngar won several awards including the Young Researcher in Computer Science Engineering", from Global Outreach Education Summit and Awards 2019, on 31 January 2019 (Thursday) at Delhi, India. Also, Dr. Elngar awards Best Young Researcher Award (Male) (Below 40 years)", Global Education and Corporate Leadership Awards (GECL-2018), Plot No-8, Shivaji Park, Alwar 301001, Rajasthan.

Dr. Ihtiram Raza Khan

Have a total experience of 24+ years at university level in the field of teaching at UG/PG level. Currently working as an Associate Professor in Department of Computer Science, Faculty of Engineering and Technology, Jamia Hamdard, New Delhi since October 2006. And heading the placement wing of Jamia Hamdard, Computer Science department.

PUBLICATIONS (Books, Research papers, book chapters), PRESENTATIONS AND TRAININGS 50+

Mr. Ahmed Jabbar Obaid Al-Janabi

Ahmed J. Obaid B.Tech IT, College of Computers, Anbar University IRAQ M.Tech CSE, College of IT, JNT University, INDIA PhD. CS, College of IT, Babylon University, IRAQ.

Research Interest: Data Mining Analysis , Web Mining Techniques , Web image processing.

Selected Paper Publications:

*Object detection and recognition by enhanced SURF

2016 - Science - International Journal of Computer Science and Network Security

*Discovering similar user navigation behavior in Web log data

2016 - Engineering - International Journal of Applied Engineering Research

*Object Based Image Retrieval Using Enhanced SURF

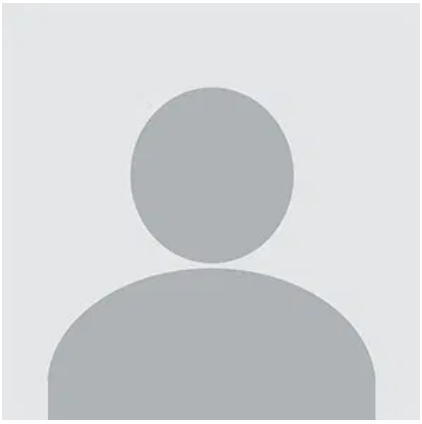
2016 - Engineering - Asian Journal of Information Technology

*AN EFFICIENT WEB USAGE MINING ALGORITHM BASED ON LOG FILE DATA

2016 - Engineering - Journal of Theoretical and Applied Information Technology

*Novel algorithms for Log file content analysis

2017 - Engineering - Under Review



Dr. Ronielle B. Antonio

Mr. Ersan Yudhapratama Muslih

Ersan Y. Muslih is a researcher and staff member at Mechanical Engineering Department, Trisakti University. He got a master's degree in material science and engineering from Yeungnam University, South Korea. He is currently is a Ph.D. student at Material Chemistry Division, Natural Science and Technology, Kanazawa University, Japan. His research interest is about materials, photovoltaic and renewable energy. His current research is about kesterite and perovskite solar cells and had several publications on it.

CONFERENCE PROGRAM

Day 1, Monday, June 21st, 2021

Time (UTC+8)			*Dur'*	*Dur'*	*Activity*
MECON Room 1 *https://us02web.zoom.us/j/86045538900?pwd=R1M3QVZqRWdPZG9mWmdISEd1WTRHdz09* *Meeting ID: 860 4553 8900* *Password: DIFCON2021*					
13:00	-	13:05	0:05	5'	**MC Welcoming**
13:05	-	13:45	0:40	40'	KEYNOTE 1: MECON SPEAKER: PROFESSOR DR. ROSALINA ABDUL SALAM TOPIC: “HUMAN AND MACHINE IN THE AGE OF AI”
13:45	-	13:50	0:05	5'	Session Chair Introduction
13:50	-	16:20	2:30	150'	**Presentation Session 10 person/room** 15 minutes/presenter
16:20	-	16:30	0:10	10'	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
16:30	-				Break & Announcement to go to Main Room at 16.30

Day 2, Tuesday, June 22nd, 2021

Time (UTC+8)			*Dur'*	*Dur'*	*Activity*
MECON Room 1 *https://us02web.zoom.us/j/88090097058?pwd=ZzNMRTdCMURIZWRPdGtsaXBmSm01UT09* *Meeting ID: 880 9009 7058* *Password: DIFCON2021*					
9:30	-	9:40	0:10	10'	**MC Welcoming**
9:40	-	10:20	0:40	40'	KEYNOTE 2: MECON SPEAKER: PROFESSOR DR. ZAHRILADHA ZAKARIA TOPIC: RECENT TRENDS, CHALLENGES, AND OPPORTUNITIES OF ENGINEERING APPLICATION
10:20	-	11:50	1:30	90'	MECON INDUSTRIAL FORUM (MODERATED BY DR. TAN WOOI HAW) TOPIC: “THE IMPORTANCE OF HUMANIZING INNOVATION IN ENGINEERING IR4.0” FORUM PANELIST: DR. MAZLAN ABBAS, PROF. IR. DR. HAFIZAL MOHAMAD, MR. ROBBIE PANG WEI LAO
Main Room https://zoom.us/j/94857652943?pwd=aUtXdnUrS2NpTmVWV09kWjYxb1Rvdz09 Meeting ID: 948 5765 2943 Passcode: difcon2021					
11:00	-	11:05	0:05	5'	Session Chair Introduction
11:05	-	13:35	2:30	150'	**Presentation Session 10 person/room** 15 minutes/presenter

Time (UTC+8)			*Dur'*	*Dur'*	*Activity*
13:35	-	13:45	0:10	10'	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms (main room)
13:45	-	14:00	0:15	15'	Break
MECON Room 1 *https://us02web.zoom.us/j/88090097058?pwd=ZzNMRTdCMURIZWRPdGtsaXBmSm01UT09* *Meeting ID: 880 9009 7058* *Password: DIFCON2021*					
14:00	-	14:05	0:05	5'	Session Chair Introduction
14:05	-	16:20	2:15	135'	**Presentation Session 9 person/room** 15 minutes/presenter
16:20	-	16:30	0:10	10'	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
16:30	-				Break & Announcement to go to Main Room at 16.30

Day 3, Wednesday, June 23rd, 2021

Time (UTC+8)			*Dur'*	*Dur'*	*Activity*
MECON Room 1 & 2 ****Mecon Room 1*** *https://us02web.zoom.us/j/89247516313?pwd=b0dOZnNDb0JIR2RZYVMvR2V1dWF3QT09* *Meeting ID: 892 4751 6313* *Password: DIFCON2021* ****MECON Room 2*** *https://us02web.zoom.us/j/84901045597?pwd=bDVZTG02NEIyS2c1NS84K0U2cVFnZz09* *Meeting ID: 849 0104 5597* *Password: DIFCON2021*					
9:30	-	9:35	0:05	5'	**MC Welcoming**
9:35	-	9:40	0:05	5'	Session Chair Introduction
9:40	-	12:40	3:00	180'	**Presentation Session 12 person** 15 minutes/presenter
12:40	-	12:50	0:10	10'	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
12:50	-	13:05	0:15	15'	**Break**
13:05	-	13:10	0:05	5'	Session Chair Introduction
13:10	-	16:10	3:00	180'	**Presentation Session 12 person** 15 minutes/presenter

Time (UTC+8)			*Dur'*	*Dur'*	*Activity*
16:10	-	16:20	0:10	10'	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
16:20	-				Break & Announcement to go to Main Room at 16.30

Day 1: Monday - June 21, 2021

MECON - Room 1

https://us02web.zoom.us/j/86045538900?pwd=R1M3QVZqRWdPZG9mWmdISEd1WTRHdz09
Meeting ID: 860 4553 8900
Password: DIFCON2021

Session 1: 13.50 - 16.20 (UTC+8)

Session Chair: Dr. Siti Azlida & Mr. Ronnie Bituin

Track Nanotechnology

Paper ID	Presenter	Paper Title
MEC21120	Benedict Wen-Cheun Au	Electrochromic Device Based on PMMA Gel Polymer Electrolyte
MEC21131	Ahmad Khawarizmi	High Efficiency Switched-Capacitor DC-DC Converter
MEC21134	Nurul Izzati Abdul Shukor	Realization of Dye-Sensitized Solar Cells Based on Food Ingredients
MEC21135	Duu Sheng Ong	A Nonlocal Model for Spatial Distribution of Impact Ionization in Semiconductors
MEC21142	Teo Lay Lian	Investigation on Ion Exchange of Heavy Metals on Polypyrrole-poly-4-styrenesulfonate (PPy/PVS) Film at Ti Electrodes
MEC21149	Nisha Kumari Devaraj	Predictive Modelling of As(V) Adsorption onto Surface-engineered Magnetite Nanoparticles

Track Electrical Engineering

Paper ID	Presenter	Paper Title
MEC21137	Jia-Jun Lok	Optimal Production Scheduling for Multi Stage Production Line with Parallel Machines
MEC21140	Lim Jia Yan	Anomalous Energy Consumption Detection Based on Naïve Bayes Approach
MEC21144	Yew Keong Sin	Building Arduino Based Syringe Pump for Electrospinning
MEC21146	Siow Chun Lim	Evaluation of the Safe Distance of Malaysia's Power Transmission Line from Residential Area Considering the EMI Radiation Effect

Day 2: Tuesday - June 22, 2021

MECON - Main Room

https://zoom.us/j/94857652943?pwd=aUtXdnUrS2NpTmVWV09kWjYxb1Rvdz09
Meeting ID: 948 5765 2943
Passcode: difcon2021

Session 1: 11.05 - 13.35 (UTC+8)

Session Chair: Engr. Christopher C. Mira

Track Electrical Engineering

Paper ID	Presenter	Paper Title
MEC21159	Shashikumar Krishnan	Universal Industrial Motor Fault Detection with Minimized Sensors
MEC21162	Bhuvaneswari Thangavel	Design of Voice Controlled Home Automation System
MEC21165	Chitra Venugopal	Automation of Different Size Bottle Filling and Capping System using PLC LogixPro Simulation
MEC21179	Siow Chun Lim	Lightning Activities during the COVID-19 Pandemic
MEC21132	Siow Chun Lim	Public Awareness of Lightning Safety in Malaysia
MEC21147	Yew Keong Sin	Design Foot Step Power Generation Device using Barium Titania
MEC21180	Chitra Venugopal	Automatic Vehicle Fueling System using PLC Controlled Robotic Arm

Track Mechanical Engineering

Paper ID	Presenter	Paper Title
MEC21124	Andrew Tong Yew Tak	On Modelling and Optimization of Energy Consumption of Prototype Electric Vehicle
MEC21130	Chee Kuang Kok	Modelling Mode I Failure at Crack Tip with Verifications using Digital Image Correlation
MEC21154	Chockalingam Palanisamy	Artificial Neural Network Modelling of 3D Printed Aluminium PLA Part

Day 2: Tuesday - June 22, 2021

MECON - Room 1

https://us02web.zoom.us/j/88090097058?pwd=ZzNMRTdCMURIZWRPdGtsaXBmSm01UT09
Meeting ID: 880 9009 7058
Password: DIFCON2021

Session 2: 14:05 - 16:20 (UTC+8)

Session Chair: Ms. Siva Priya & Dr. Ahmed Elngar

Track Mechanical Engineering

Paper ID	Presenter	Paper Title
MEC21181	Chockalingam Palanisamy	Response Surface Modelling of 3D Printed Bronze Part

Track Electronics

Paper ID	Presenter	Paper Title
MEC21107	Fathin Izzaty Fahmi	Development of an IoT Enabled Waste Monitoring System
MEC21117	M Chandran Maruthan	Hearing Aid for Profound Deaf People by using the Concept of Audio Spectrum Analyser
MEC21172	Suheib Sherif	Effect of Clips Duration and Training Complexity in Video Classification Models
MEC21183	Turki Khaled Salem	One Ringgit and Five Ringgit Malaysian Banknotes Reader Featuring Counterfeit Detection

Track Robotics (outline)

Paper ID	Presenter	Paper Title
MEC21141	Tian Soon Lee	Simmechanics Model and PD-FL Integrated Controller of 2-DOF Robot for Position Control

Track Telecommunications Engineering

Paper ID	Presenter	Paper Title
MEC21114	Sridhar Nagisetty	An Enhanced Broadband Class-J Mode Power Amplifier for 5G Smart Meter Applications
MEC21119	Mohamad Yusoff Alias	Review on Machine Learning Intelligent Reflective Surfaces for Beyond 5G Communications
MEC21125	Yee-Loo Foo	Wireless Power Transfer with Wave Diversity

Track Computing In mathematics, natural Sciences, engineering, And medicine

Paper ID	Presenter	Paper Title
TIC21122	Poh Ping Em	Data Fusion-based Lane Departure Warning System using Fuzzy Logic

Day 3: Wednesday - June 23, 2021

MECON - Room 1

https://us02web.zoom.us/j/89247516313?pwd=b0dOZnNDb0JIR2RZYVMvR2V1dWF3QT09
Meeting ID: 892 4751 6313
Password: DIFCON2021

Session 1: 9:40 - 12:40 (UTC+8)

Session Chair: Ms. Siva Priya & Dr. Ihtiram Raza Khan

Track Telecommunications Engineering

Paper ID	Presenter	Paper Title
MEC21148	Ivan Ku	Multicarrier Modulation Waveform for 5G and Beyond Technology
MEC21153	Noorlindawaty Binti Md Jizat	Substrate Integrated Waveguide 3 3 Butler Matrix for 5G MM-Wave Beamforming
MEC21160	Md Tanvir Ahmed	Design of a Quad-band Rectenna for Ambient Energy Harvesting from RF Electromagnetic Signals
MEC21161	Prince Ugochukwu Nmenme	Adaptive Data Rate Algorithm in LoRAWAN for 5G Wireless Communication
MEC21168	Mardeni Bin Roslee	A Survey on the Impact of the Power Allocation Scheme on the Achievable Throughput under Imperfect SIC in NOMA System for 5GNetworks
MEC21170	Mardeni Bin Roslee	Investigation of Adaptive Data Radio for LoRAWAN-Based Infrastructure

MEC21182	Surajo Muhammad	Design of a Broadband Long-Range RF-Rectifier Circuit for Harvesting Ambient Energy
MEC21169	Mardeni Bin Roslee	Algorithm of Radio Resource Allocation in Device-to-Device (D2D) Communication for 5G Networks
MEC21129	Surajo Muhammad	Design of Wideband Circular Slot Antenna for RF Energy HarvestingSystem

Track Photonics

Paper ID	Presenter	Paper Title
MEC21163	Noor Shafikah Md Rodzi	Distributed Heating Effect on Serial Dissimilar in-Line Mach-Zehnder Interferometer
MEC21164	Amirul Hazimi Abu Bakar	Point Force-to-Distributed Uniform Strain Conversion Based on Modified Cantilever Transducer for Fiber Optic Sensors

Track Optical and Converged Optical-wireless Networks

Paper ID	Presenter	Paper Title
MEC21174	Rahat Ara	Performance Analysis of Relay-Assisted Free-Space Optical Communication Links

Day 3: Wednesday - June 23, 2021

MECON - Room 1

https://us02web.zoom.us/j/89247516313?pwd=b0dOZnNDb0JIR2RZYVMvR2V1dWF3QT09
Meeting ID: 892 4751 6313
Password: DIFCON2021

Session 2: 13:10 - 16:10 (UTC+8)

Session Chair: Engr. Christopher C. Mira & Mr. Ahmed Jabbar Obaid Al-Janabi

Track Engineering and Technology

Paper ID	Presenter	Paper Title
MEC21106	Alvin Ming Song Chong	Zone-Based Indoor Positioning System using Fingerprinting Localization with Neural Networks
MEC21108	Shruthi Thangaraj	Study of Missing Data Recovery Mechanisms for Phasor Measurement Unit (PMU)
MEC21109	Chy Mohammed Tawsif Khan	Emotion Recognition using Decision Tree with Selected Statistical Electrocardiogram Features
MEC21110	Nor Hidayati Abdul Aziz	Simulated Kalman Filter – Five Years Later
MEC21111	Nursabillilah Mohd Ali	Microarray Gene Expression Breast Cancer Classification using Machine Learning Method
MEC21112	Norhidayah Mohamad	Application of Fuzzy Logic to Bed Pressure Control in Fluidized Bed Granulator

MEC21113	Dr. Faridah Maarof	Implementation of Student Course Evaluation: Pandemic Impact on the Non-Constraint Engagement (NCE) Model
MEC21115	Mohamed Haziq Bin Mohamed Hatta	Design of Low-Cost IoT Smart Agriculture System
MEC21116	Muhammad Jefri Muril	Design of a Rainy Lane Detection System using Deep Learning Approach
MEC21118	Cha Chee Sun	AC Impedance Measurements on PAN Polymer Electrolytes Doped with SiO2 Filler
MEC21127	Haziq Muqri Bin Nawawi	Low-Cost Automated Mobile Medication Dispenser for Elderly
MEC21150	Adamu Muhammad Buhari	Implementation of Automatic Micro-Expression Recognition for Real-Time Systems

Day 3: Wednesday - June 23 2021

MECON - Room 2

https://us02web.zoom.us/j/84901045597?pwd=bDVZTG02NEIyS2c1NS84K0U2cVFnZz09
Meeting ID: 849 0104 5597
Password: DIFCON2021

Session 1: 09.40 – 12.40 (UTC+8)

Session Chair: Dr. Siti Azlida & Dr. Ronielle B. Antonio

Track Engineering and Technology

Paper ID	Presenter	Paper Title
MEC21167	Keshvinder Singh Randhava	5G Dynamic Spectrum Management for Vehicle-to-Vehicle Communication
MEC21177	Poh Kiat Ng	Driving Menace: A Triz-Adopted Solution for the Posterior Pelvic Tilt Issue

Track Optics

Paper ID	Presenter	Paper Title
MEC21175	Najmuddin Salmi Mat Nanyan	Glare Rating Assessment on an Optimized Stadium LED Lighting Architectural Design

Track Automation

Paper ID	Presenter	Paper Title
MEC21152	Fajaruddin Mustakim	Serious Conflict Due Lane Change at Unsignalized T-Junctions on Malaysia Rural Roadways
MEC21128	Md. Shabiul Islam	A Comparative Analysis of Performances Between Simulated Annealing and Genetic Algorithm

Track Micro Electronics

Paper ID	Presenter	Paper Title
MEC21166	Chinnaiyan Senthilpari	Low Power, Less Occupying Area and Improved Speed of a 4 Bit Router/Re-Router Circuit for LDPC Decoders

Track Industry 4.0

Paper ID	Presenter	Paper Title
MEC21121	Muhammad Nurmahir Mohamad Sehmi	Pancreatic Cancer Grading in Pathology Images
MEC21126	Abdullah Al Mamun	An Accurate Lane Markings Detection Approach Executing Encode-Decode Instant Segmentation Network (EDIS-Net) with Differential Losses
MEC21133	Abubaker Sherif	A Health Status Classification Model for Enabling Home Hospitalization
MEC21136	Muhammad Aslam Khan Mohd Rashid Khan	People Counter and Social Distancing Detection System using Intel Up Squared Board

MEC21138	Omar Abdulla Abdelghany Sinoussy	An Optimized Deep Learning-Based Framework for Pinpointing Energy Theft and Meter Irregularities
MEC21139	Yar-Lee Teo	Optimizing Energy Consumption of a Rice Milling Plant Through Intelligent Control of the Paddy Dryer

Day 3: Wednesday - June 23, 2021

MECON - Room 2

https://us02web.zoom.us/j/84901045597?pwd=bDVZTG02NEIyS2c1NS84K0U2cVFnZz09
Meeting ID: 849 0104 5597
Password: DIFCON2021

Session 2: 13:10 - 16:10 (UTC+8)

Session Chair: Mr. Ersan Yudhapratama Muslih & Mr. Ronnie Bituin

Track Industry 4.0

Paper ID	Presenter	Paper Title
MEC21143	Nur Asyiqin Binti Amir Hamzah	Impact on Human Emotion When Listening and Reciting Quran - A Review
MEC21145	Nur Hasanah Ali	Review of Brain Stroke Segmentation Techniques Based on Computed Tomography (CT) Images
MEC21151	Yee Kit Chan	The Development of Drone Based Hyperspectral Imaging System for Precision Agriculture
MEC21155	Nouar AlDahoul	Convolutional Long Short-Term Memory for Distortion Classification in Laparoscopic Videos
MEC21156	Atiqullah Mohamed Daud	Road Marker Classification Mechanism using Slope Contour Analysis in Rainy Days

MEC21171	Yvonne Kam	Using Emojis in a Shoulder-Surfing Resistant Authentication Method
MEC21158	Mohd Faizal Bin Ismail	Flood Simulation and Control using Augmented Reality Sandbox
MEC21157	Nouar AlDahoul	Encoding Retina Image to Words using Transformer for Diabetic Retinopathy Grading
MEC21173	Chin Kit Ng	Video-based Facial Emotion Recognition using Deep Learning Detector and Classifier
MEC21122	Ahmed Ali Mahjoub Mohammed	Road Congestion Analysis in Video Stream
MEC21123	Eilham Hakimie Jamal Mohd Lokman	Driving Style Profiling using Machine Learning
MEC21101	Md. Shabiul Islam	Development of an Algorithm on Smart Agriculture Monitoring System for Internet of Things (IoT) Applications

Track: Nanotechnology

Electrochromic Device Based on PMMA Gel Polymer Electrolyte

Benedict Wen-Cheun Au[1], Chan Kah Yoong[2]

[1,2]Faculty of Engineering, Multimedia University

Abstract

Background - *Electrochromism is the phenomena of reversible colour change in electrochromic (EC) materials under the influence of a small applied voltage. The electrolyte layer is a vital component in a typical EC device (ECD) which governs the electrochemical reaction within and thereby the overall performance of the ECD.*

Purpose - *One of the main challenges is the selection of a proper electrolyte in order to optimise the operation of an ECD in terms of operating voltage, switching time and level of opacity. Moreover, the selected electrolyte should possess high ionic conductivity and chemically stable. In this work, lithium perchlorate and poly(methyl methacrylate) in propylene carbonate plastisicer (LiClO4:PMMA:PC) was deployed as the gel polymer electrolyte (GPE) to demonstrate the functionalities of the ECD.*

Design/methodology/approach - *The ECDs were fabricated with the GPE sandwiched between the WO3 EC layer and two electrode layers using a spacer. Subsequently, the ECDs were sealed with silicone sealant and left to dry before all measurements. The EC properties of the ECDs were examined by cyclic voltammetry (CV) and chronoamperometry (CA) techniques. The optical properties were measured by ultraviolet-visible (UV-Vis) spectrophotometer.*

Findings - *In the original state, ECDs based on GPE exhibited 80 % transmittance in the visible range. The optical transmittance modulation was close to 20%, and the coloration efficiency was more than 50 cm2/C).*

Research limitations - *On the other hand, sealing technology of ECDs remains a challenge as to completely prevent leakage in electrolyte from within the ECDs.*

Originality/value - *This work demonstrates a potential solid ECDs made with GPE, which may pave the way for the realization of solid-state ECDs, which are the game changers in Smart/Intelligent Window applications.*

Keywords : Electrochromic device (ECD), Gel polymer electrolyte (GPE), Smart Windows, Intelligent Windows.

High Efficiency Switched-Capacitor DC-DC Converter

Ahmad Khawarizmi[1], Lini Lee[2]

[1,2]Multimedia University

Abstract

Background - *Current technology has led us to smaller electronics devices and this shows the need of smaller supply voltage capacity for the devices to work efficiently. A converter is needed to regulate the voltage to meet a device's requirement. As the size of portable devices shrunk, the load current and supply voltage becomes lower and lower. Thus, an electronic conversion becomes more popular, introducing the Switched-Capacitor (SC) DC-DC converter.*

Purpose - *SC DC-DC converter uses only capacitors as charge-transfer devices. Capacitors are known to have better energy density and simpler, more cost-effective integration on-die in CMOS processes. This project aims to design a multiple topology of DC-DC converter circuit for more than one voltage gains region using SC method. In this topology, the transformer ratio itself is modified by switching between topologies based on the required voltage gains region. The voltage gains regions used in this project are 1/2 and 2/3. The efficiency of the network depends on the input voltage. For example, if the input is 3 V and desired voltage is 2.8 V, the efficiency will be 53.57% in the 1/2 gain region and 71.43% in the 2/3 gain region.*

Design/methodology/approach - *The proposed circuit has been designed using KVL method using 0.5 µm CMOS technology. The circuit is divided into 2 phases; common phase and discharge phase. Common phase is the phase where the capacitor is charged and connected in parallel while in discharge phase the capacitor is connected in parallel for the 1/2 gain region and in series for the 2/3 gain region. Then, the switches in the circuit are turned on or off depending on the phase and gain regions.*

Findings - *The post layout implementation showed that the high efficiency networks are achieved with low voltage drop and low internal resistance. The efficiency of the network is shown to be advantageous compared to other literature papers.*

Research limitations - *Clock cycle controller can be added to control the phase of the clock in order to reduce any uncertainty at the output.*

Originality/value - *A multiple topology of DC-DC converter circuit for more than one voltage gains region using SC method has been designed.*

Keywords : high efficiency, DC-DC converter, switched-capacitor method

Realization of Dye-Sensitized Solar Cells Based on Food Ingredients

Nurul Izzati Abdul Shukor[1], Mian-En Yeoh[2], Pei-Ling Low[3], Ahmad Farimin Ahmad Osman[4], Nisha Kumari Devaraj[5], Yew-Keong Sin[6], Kah-Yoong Chan[7]

[1,2,3,4,5,6,7]Faculty of Engineering, Multimedia University

Abstract

Background - *Dye-sensitized solar cell (DSSC) represents one of the most promising photovoltaic technologies as an alternative to conventional silicon-based solar cells. In this research, food ingredients (blueberry and mulberry) were used as the alternative natural sensitizers for the fabrication of DSSC to support the low cost production and environmental friendly approaches.*

Purpose - *To fabricate DSSC based on food ingredients in order to demonstrate a more environmental friendly approach in the realization of the DSSC.*

Design/methodology/approach - *In order to realize DSSC, titanium dioxide (TiO2) based photo-anodes were fabricated using doctor-blade approach. The natural sensitizers were extracted from blueberry and mulberry, while the counter electrode was fabricated from graphite pencil and candle soot. The solutions used for the synthesis process are isopropanol and distilled water.*

Findings - *The best-optimized DSSC performance was obtained from mulberry, via longer soaking time in isopropanol extracted dye. The DSSC with counter electrode based on carbon soot generated higher current, voltage and output power than graphite.*

Research limitations - *The DSSC performance degraded over time without sealing.*

Originality/value - *The DSSC was fabricated using blueberry and mulberry with counter electrodes of graphite and candle soot which yielded the best output power of 13.79uW.*

Keywords : Dye-sensitized solar cell, food ingredient, blueberry and mulberry, candle soot, graphite.

A Nonlocal Model for Spatial Distribution of Impact Ionization in Semiconductors

Duu Sheng Ong[1]

[1]Multimedia University

Abstract

Background - *Impact ionization of electron and hole is circumvented by design for many semiconductor devices operating at high fields, yet it is the mechanism exploited to produce the signal gain in avalanche photodiodes (APDs). The spatial distribution of impact ionization in semiconductor is a result of stochastic nature of electron or hole transport governed by the characteristic of the band structure and the various scattering mechanisms. The minimum distance that an electron or a hole must travel to attain an energy sufficient for impact ionization known as dead space is a significant fraction of its mean ionization path length at high fields.*

Purpose - *Accurate modelling of this nonlocal nature of impact ionization is important for determining the breakdown voltage in nanodevices and the reduction of excess noise in short APDs.*

Design/methodology/approach - *The Monte Carlo technique, which is inherently nonlocal, is most suitable for the modelling of impact ionization process, a physical phenomenon that depends critically on the shape of its distribution. Monte Carlo modelling is a very time-consuming computational process and a complete knowledge of the physical system under investigation is required. A powerful alternative is the Random Path Length (RPL) algorithm capable of reproducing the electron and hole impact ionization spatial distributions generated from the Monte Carlo model. The conventional RPL algorithm employed a displaced exponential assuming a hard dead space model for the probability distribution function (PDF) of ionization path length.*

Findings - *In this work, a four-parameter nonlocal model based on Weibull Frechet (WF) distribution is studied to model ionization path length PDF. The WF distribution function is found capable of replicating the salient features of the electron and hole impact ionization path length distributions in GaAs simulated by a Full-band Monte Carlo model at different applied electric fields.*

Research limitations - *The WF function can be applied to model ionization spatial distribution in other semiconductors.*

Originality/value - *Using the realistic ionization path length PDF of MC model, this WF function can accurately model impact ionization and its nonlocal properties in semiconductor devices.*

Keywords : impact ionization, dead space, nonlocal, Weibull Frechet distribution, Monte Carlo

Investigation on Ion Exchange of Heavy Metals on Polypyrrole-Poly-4-Styrenesulfonate (PPy/PVS) Film at Ti Electrodes

Teo Lay Lian[1]

[1]Multimedia University

Abstract

Background - *Recently ion-exchange technology has become one of the most widely used techniques in the treatment of industrial effluents, in the manufacturing of ultrapure water for electronic industries and for demineralization of water.*

Purpose - *In this study, we were investigating heavy metals cation-exchange incorporation from aqueous solutions.*

Design/methodology/approach - *Previously we had reported on a surface analysis investigation of electrochemically synthesized, both oxidized and reduced, polypyrrole-poly-4-styrenesulfonate (PPy/PVS) free-standing film [1]. In this study, we employed PPy/PVS film with cation-exchange properties, deposited on titanium electrodes. A potential step method was used. It was found that the sulphonated groups in the PPy/PSS film, was useful for removal of heavy metal ions at very low concentrations e.g. copper, nickel and cobalt ions (< 15 mg/L).*

Findings - *Careful use of this film was found to be able to reduce the heavy metal ions concentrations down to approximately 1 mg/L. By using Leica Q500MC image Processing and Analysis system, the uneven deposition of heavy metals ions e.g. copper, nickel and cobalt ions on the surface PPy-PSS were shown. The results of Electron Spectroscopy for Chemical Analysis (ESCA) have shown the surface behaviour with deposition of heavy metals on the electrolyte side of the PPy/PVS film.*

Research limitations - *The small scale of experimental has been performed without the large scale.*

Originality/value - *As a conclusion, PPy/PVS free-standing film was successfully been proved to be able to reduce the heavy metal ions concentrations e.g. copper, nickel and cobalt ions from less than 15 mg/L down to approximately 1 mg/L. This is another potential for the industries to explore for overcoming heavy metals problem in the manufacturing.*

Keywords : Polypyrrole-poly-4-styrenesulfonate(PPy/PVS); ESCA; Titanium electrodes; Ion-exchange; Copper; Nickel; Cobalt.

Predictive Modelling of AS(V) Adsorption onto Surface-Engineered Magnetite Nanoparticles

Nisha Kumari Devaraj[1]

[1]Multimedia University

Abstract

Background - *The nature of an adsorption process is complex. Thus, many assumptions and theories have been formulated to gain a more holistic understanding of its underlying mechanisms.*

Purpose - *Most commonly, modelling and predicting adsorption trends via various predictive techniques have been carried out to identify the types of interaction between the adsorbates and adsorbents. This would facilitate the accurate prediction of future adsorption trends.*

Design/methodology/approach - *In this study, existing data of AS(V) adsorption onto uncoated magnetite as well as humic-acid and ceria coated magnetite samples were used to develop a predictive model based on a multiple linear regression technique. The data was pre-modelled with either Freundlich or Temkin linear isotherms to understand the interactions and mechanisms involved.*

Findings - *Subsequently, the predicted outcome was compared to the actual one with the analysis involving multiple error functions such as mean square error (MSE), root mean square error (RMSE), average absolute relative error (AARE) and non-linear chi-squared value ($\chi 2$) to assess the predictive model's performance. In addition, the RMSE values obtained were also compared to that obtained from literatures, and the results were found to be satisfactory with low error margins.*

Research limitations - *The predicted value is the extension of one data point further from the training data set.*

Originality/value - *Since the proposed model is based on the adsorption data of a few different types of magnetite samples, it can be further tested on different types of adsorbents to gauge its effectiveness in accurately predicting future adsorption trends.*

Keywords : As(V) adsorption, adsorption predictive technique, surface-engineered magnetite nanoparticles, linear regression technique, error functions

Track: Electrical Engineering

Public Awareness of Lightning Safety in Malaysia

Siow Chun Lim[1], Khairul Nazli[2]

[1,2]Multimedia University

Abstract

Background - *The understanding on the level of public awareness of lightning safety in Malaysia is still lacking. Although a recent study concluded that the public is not well aware of lightning safety, the conclusion was drawn based on about 100 respondents which is not representative of the population of Malaysia. Hence, it is imperative for the survey to be conducted at a larger scale. Such information is important for the formulation of policy to enhance awareness of lightning safety among the public*

Purpose - *To gain a comprehensive understanding of the public awareness level of lightning and lightning safety.*

Design/methodology/approach - *Firstly, the questionnaire was formulated in Malay and English based on the combination of similar surveys conducted at several countries including Malaysia. The survey also allows the respondents to know their scores and correct their misconception after the completion of the survey. Then, the questionnaire was distributed online with the aim of gathering at least 1000 responses of diverse background to be representative of the population. Statistical analysis was then conducted to decipher the findings of the survey.*

Findings - *On the average, public awareness on lightning safety is at moderate level with all of them only able to answer about half of the questions correctly. Respondents from higher education level does not immediately translates to them having higher level of awareness. Urban residents were also found to score marginally better than rural residents.*

Research limitations - *Only online survey form is used as the tool for data collection. Hence, a more in-depth and personalized feedback cannot be obtained as no interview could be done during the Movement Control Orders throughout the year 2020.*

Originality/value - *The size of the respondents is representative of the population compared to the previous study. The questionnaire is a combination of questionnaires developed by several researchers in several countries. In addition, the survey also serves as an educational tool as respondents can also get to know their survey score and indirectly clear their misunderstanding towards lightning and lightning safety.*

Keywords : Lightning, lightning safety, public belief, Malaysia

Optimal Production Scheduling for Multi Stage Production Line with Parallel Machines

Jia-Jun Lok[1], Wooi-Nee Tan[2], Sook-Chin Yip[3], Ming-Tao Gan[4]

[1,2,3,4]Multimedia University

Abstract

Background - *One of the challenges in industrial manufacturing is the high monthly electricity bills which predominantly account for the energy consumption in production plants. Demand-side management (DSM) implemented based on the time-of-use tariff can reduce the burden of high energy costs by rewarding the users with lower pricing if the loads are shifted from peak to non-peak periods.*

Purpose - *Motivated by the previous work on the DSM optimization model for energy cost reduction in industrial process flow with a single machine at every stage, this paper extends the model to cater to multi-stage production lines with parallel machines. The latter is expected to be more synonymous with real-life manufacturing processes.*

Design/methodology/approach - *The proposed model utilizes binary integer linear programming which provides the optimal schedule in operating multiple machines at different stages of the production line to minimize the daily total energy cost. The model is flexible to fit a different number of machines operated parallelly at different stages. The operations are subject to the restrictions of storage volume and manpower availability at every stage. The final finished product volume must meet the targeted yield at the end of the day.*

Findings - *Simulation results for varying scenarios show that the model successfully determines the optimal schedule for multi-stage production plants with the lowest daily energy cost to fulfill the desired production volume. The obtained solutions help the manufacturer to keep track of the storage inventory throughout the day. The manpower constraint allows the supervisors to monitor and plan the human resources efficiently, which includes the rotation plan for the lunch break.*

Research limitations - *The model can be further enhanced to include the study on optimizing the maximum demand penalty or to incorporate the solar photovoltaic system on utilizing renewable energy in cost-saving.*

Originality/value - *Though the proposed model is developed for a production line with an arbitrary number of parallel machines, the dimension can be reduced to fit to process flow line with a single machine. Its great flexibilities and generic mathematic representations allow the manufacturer to control the energy consumption for varying settings of manufacturing plants in the real world.*

Keywords : industrial, demand-side management, load scheduling, linear programming

Anomalous Energy Consumption Detection Based on Naïve Bayes Approach

Lim Jia Yan[1], Tan Wooi Nee[2], Tan Yi Fei[3]

[1,2,3]Multimedia University

Abstract

Background - *Industrial energy management has emerged as an important component in monitoring energy consumption particularly with the recent trend of migrating towards IR 4.0. The capability to detect anomalies is essential as it serves as a precaution step for real-time response to mitigate the maximum demand penalty.*

Purpose - *The purpose of this research is to develop a high accuracy anomalies detection algorithm to identify anomalies in the energy consumption data recorded by a smart meter.*

Design/methodology/approach - *The proposed anomaly detection algorithm utilized a combination of supervised and unsupervised machine learning techniques, namely isolation forest and Gaussian NaÏve Bayes. The smart grid data is extracted from the Irish Social Science Data Archive (ISSDA). The data is first labelled by using Isolation Forest so as to categorise them into normal and abnormal groups. This is followed by Gaussian NaÏve Bayes to classify and predict the anomalies of the smart meter reading.*

Findings - *The combination of these machine learning techniques shows significant accuracy in predicting the anomalies in the smart meter readings. The data is divided into the training/testing and validation sets according to a ratio of 7:3. The overall accuracy achieved on the validation process is up to 85%. The precision, recall and F1 score for the normal data are 93%, 86% and 89%, respectively. Whereas the corresponding scores for the abnormal data set are 68%, 83% and 75%.*

Research limitations - *The data used in this research is limited to only Small Medium Enterprise (SME) category in ISSDA, with the smart meter readings obtained are less than a month. In order to improve the performance, larger amount of smart meter readings is needed to train the model. Further enhancement on handling the imbalanced data need to be incorporated also as the occurrence of anomalous is lower than the normal data.*

Originality/value - *The proposed algorithm is a hybrid approach based on Isolation Forest and Gaussian NaÏve Bayes is able to provide satisfactory accuracy in anomaly electricity consumption detection based on a smart meter reading. The study serves as a fundamental framework which could be incorporated to industrial energy management system.*

Keywords : Anomaly detection, Isolation Forest, Gaussian NaÏve Bayes

Building Arduino Based Syringe Pump for Electrospinning

Yew Keong Sin[1], Eu Kwan Wee[2]

[1,2]Multimedia University

Abstract

Background - *Nanofiber has unique characteristics such as lightweight with small diameters, high surface-to-volume ratio and excellent mechanical efficiency. Electrospinning method is the most promising, fastest and easiest method in fabricating nanofibers. However, the typical electrospinning systems used in laboratory usually cost USD 17,000 to USD 60,000. Besides, the challenge in building a syringe pump is dispensing polymer solution at a slow constant rate.*

Purpose - *In this project, a syringe pump for electrospinnign was built using Arduino UNO microcontroller. Polyvinyl alcohol nanofiber was then fabricated with this Arduino controlled electrospinning systems.*

Design/methodology/approach - *The building blocks of the syringe pump was first designed with Tinkercad and subsequently printed with a 3D printer. A stepper motor was used to move the pusher block while pressing the syringe at a slow constant rate. This is important for electrospinning because polymer solution needs to be extracted from the syringe constantly and slowly. A stepper motor driver worked with the Arduino UNO microcontroller in controlling the rotation of stepper motor which subsequently control the feed rate of syringe pump. Polyvinyl alcohol was dissolved with distilled water as the polymer solution for nanofiber electrospinning. The fabricated polyvinyl alcohol fiber were observed under optical microscope and atomic force microscope.*

Findings - *The total cost of the Arduino based syringe pump is approximately RM250. By controlling step size and step delay of the step motor, a syringe pump with the ability to dispense 0.05 ml, 0.125 ml, 0.2 ml, 0.25 ml and 2.5 ml of polymer solution in 15 minutes was built. The feed rate and corresponding step size and step delay are shown in table below. Polyvinyl alcohol fiber with diameter at 3.52µm was fabricated using this syringe pump as shown in figure below.*

Research limitations - *Compared to the commercial syringe pump, the Arduino based syringe pump has limited feed rates. However, the syringe pump has great potential as the affordable education kit for secondary school in promoting nanotechnology.*

Originality/value - *As a conclusion, a syringe pump for electrospinning was successfully built using Arduino UNO microcontroller.*

Keywords : electrospinning, syringe pump, nanofiber, Arduino

Evaluation of the Safe Distance of Malaysia's Power Transmission Line from Residential Area Considering the EMI Radiation Effect

Siow Chun Lim[1], Azhan Fikry[2]

[1,2]Multimedia University

Abstract

Background - *There has been rising concern amongst the public regarding their home's proximity from high tension power transmission lines. The primary cause of fear is the impact of the EMI radiation on the nearby occupants' health. Despite the presence of national permissible limits of EMI radiation, there is still lacking of information on the EMI radiation of the types of power lines configuration in Malaysia.*

Purpose - *To analyse and correlate the prescribed global limits of permissible radiation of EMI and minimum separation distance from high tension power transmission lines to a habitable vicinity in Malaysia.*

Design/methodology/approach - *The magnetic field of several selected power transmission lines were simulated using the EMFACDC program from the Recommendation ITU-T K.90. Five types of power transmission lines available in Malaysia are considered namely 132kV Double Circuit Power Transmission Line, 275kV Double Circuit Power Transmission Line, 132/132kV Quadruple Circuit Power Transmission Line, 275/132kV Quadruple Circuit Power Transmission Line and 500kV Double Circuit Power Transmission Line. Upon simulation, the magnetic field was benchmarked against the limit prescribed by ICNIRP which is adopted as Malaysian Standard (MS 2232). Recommendation on the separation distance is then made.*

Findings - *The simulated EMF levels at all of the power lines' Right of Way (ROW) boundary complies with the prescribed exposure limit. Even the highest EMF level (500kV untransposed double circuit power line) is only 3.38% of the permissible limit of 200 µT at the ROW boundary of 30 m. However, the EMF level increases significantly as the separation distance is reduced from 30 m. For a more conservative approach, the ROW can be set at 30 m across all transmission voltage level and corridor area condition.*

Research limitations - *No physical measurements were done in this study. Simulated results were verified by benchmarking with simulation results in similar published works based on the same set of parameters.*

Originality/value - *Correlation studies of the known EMF exposure limit and the safe distance of Malaysia's power transmission lines from the residential areas are conducted and the findings may be used to reaffirm the compliance of the power lines radiation as per the ICNIRP recommendation.*

Keywords : EMI radiation, power transmission lines, EMF, ELF, Right-of-Way

Design Foot Step Power Generation Device using Barium Titania

Yew Keong Sin[1], Wassem Ibrahim Abdelhamid Eldusuqi Altabaji[2]

[1,2]Multimedia University

Abstract

Background - *Human steps are untapped resources. Averagely, Malaysians walk 3,963 steps per day. Piezoelectric material can generate small electricity from the vibration and pressure that applied on it. As a result, energy from human steps can be harvested for use in powering electronic devices. Among the piezoelectric materials, barium titanate is lead-free, has high piezoelectric coefficient (149 pC/N) and dielectric constant (100-11000).*

Purpose - *In this project, a foot step power generation device was designed and fabricated. Barium titanate was applied to fabricate piezoelectric sensor that used to harvest energy from human steps.*

Design/methodology/approach - *This project is divided into two stages: fabrication of piezoelectric transducer and design of power generation device. In the first stage, piezoelectric transducers were fabricated by depositing barium titanate on metal substrates and compressing them with pelletizer. Polyvinyl alcohol was mixed with barium titanate to work as binder. Copper and aluminium with different thicknesses were used as the metal substrate of the piezoelectric transducers. In the second stage, piezoelectric transducers were connected to a full wave bridge rectifier and then to a lead acid battery for energy storage. The acid battery was connected to voltage sensor which controlled by Arduino to measure the voltage level inside the lead acid battery. In this project, piezoelectric transducers were connected in two ways: series and parallel. Besides, the output voltage generated by people with different weights were measured.*

Findings - *The average output voltage generated by the 0.1mm-thick copper substrate piezoelectric transducer is 8.6 mV when an 85 kg man stepping on the transducer. This is the highest average output voltage among the fabricated transducers with aluminium and copper substrates at different thicknesses. When the human with different body weights step on the 0.1mm-thick copper substrate piezoelectric transducer, the results show proportional relationship between the generated output voltages and human body weights. Besides, piezoelectric transducers connected in parallel always produce higher voltage compare to piezoelectric transducers connected in series.*

Research limitations - *The generated voltage is small.*

Originality/value - *As a conclusion, the concept of foot step power generation was successfully been proved to generate small voltage with human steps. This is another potential green energy to be explored for overcoming the power challenge in wearable electronic devices.*

Keywords : energy harvester, barium titanate, piezoelectric, micropower supply

Universal Industrial Motor Fault Detection with Minimized Sensors

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[1]Lecturer at Multimedia University, [2]Multimedia University, Faculty of Computing and Informatics

Abstract

Background - *Background - Major player of industry is the induction motor. The motors are in motion and mechanical in nature causing many wear and tear creating need for frequent maintenance example brush contact change. Un-mannered and un-frequent monitoring of motors which is common in the industry would easily overexert it self causing major fault. If the motor fault was detected earlier with automated fault monitoring it would have been just a minor fault, reducing the cost and down time of production due the motor repairs.*

Purpose - *All the three method needs at least 6 sensors for a 3-phase motor detection three sensors for current and three for voltage. We have proposed a new method of monitoring fault in 3-phase industrial motors using HT instantaneous current signature curve only, reducing the number of sensor to only three units of current transformers.*

Design/methodology/approach - *There are few types of method to detect 3 phase motor faults fault available. One by analyzing average vibration signals values of V, I, pf, P, Q, S, THD and Frequency. Two by analyzing signatures of V and I frequency in Hilbert Transform (HT) domain. Three by analyzing instantaneous signals of V and I trajectory lissajous curve.*

Findings - *Our system detect fault signature accurately at any voltage or current levels whether it is delta or star connected motors. This is due to our system design incorporated with normalized curves of HT in the fault analysis database. We have conducted the experiment in campus laboratory for two different 3-phase motors with four different fault experiments. The results shown in this paper are comparison of two methods, the V and I lissajous trajectory curve and our HT instantaneous current signature curve.*

Research limitations - *If the fault signatures only happens at voltage side the system could not detect fault. Where this very rare happens.*

Originality/value - *We have chosen other system as benchmark and their fault results resemble close with our system results but our system has the upper hand universality and cost reduction of sensor to 50%.*

Keywords : Hilbert Transform, AI, 3-phase, Induction Motor

Design of Voice Controlled Home Automation System

Bhuvaneswari Thangavel[1], Chitra Venugopal[2]

[1]Faculty of Engineering and Technology, Multimedia University, [2]Department of Renewable Energy, Oregon Institute of Technology

Abstract

Background - *The technology of home automation system has already becomes part of daily life for most families. It makes the family members to feel safe and happy in everyday life especially when there are elderly at home.*

Purpose - *The main purpose of this study is to help the people with disabilities or elderly with a low cost and an easy to use home automation system using voice control. This work demonstrates a system that can allow one to wirelessly control lights, fans, radio and other appliances using an app.*

Design/methodology/approach - *Voice control home automation system uses an Android smart phone and microcontroller to control home appliances. An Android app is developed for this work with security features. To unlock the system, user needs to key in the username and password that are already set in the memory by the owner. After unlocking the security system, user is able to enter the controller interface. This interface has three main functions which are Bluetooth, voice recognition and manual control switch. Bluetooth technology is used as the wireless transmission medium. Voice recognition is performed using Google Cloud Speech API which it helps in converting human speech to text. The text generated by it is then sent to slave to perform home automation using Bluetooth as medium. The third function is manual control switch for the user. In order to control high voltage appliances, an enhancement of microcontroller is needed by adding a relay circuit to turn ON/OFF.*

Findings - *The developed prototype with the hardware and software is tested with the security features and home appliances.The objectives of the work is achieved successfully.*

Research limitations - *The developed prototype with the hardware and software is tested with the security features and home appliances.The objectives of the work is achieved successfully.*

Originality/value - *ome automation system involves security features. Hence instead of buying the existing system available in the market, it is most appropriate to design a low cost customized home automation system.*

Keywords : Voice control, Home automation, wireless control, microcontroller

Automation of Different Size Bottle Filling and Capping System using PLC LogixPro Simulation

Chitra Venugopal[1], Bhuvaneswari Thangavel[2]

[1]Oregon Institute of Technology, [2]Multimedia University

Abstract

Background - *Industrial automation systems are used to control and monitor a process, machine or device in a computerized manner that usually fulfills repetitive functions or tasks. The application of PLCs is increasing day by day in automation industry. Filling is the task that is carried out by a machine and this process is widely used in many industries.*

Purpose - *The objective of this paper is to design, develop and monitor different size bottle filling and capping system using PLC LogixPro simulation. To develop the process of bottle filling of different sizes and capping using animated simulation as a study material for PLC based automation system*

Design/methodology/approach - *PLC ladder diagram approach is used for the study. In this study, the bottles lines up for filling automatically. The system checks for broken bottles and open the gate to divert the broken bottles into scrap area where it is collected in a box. The remaining bottles moves continuously on the main conveyor belt. Sensors are added to measure the height of the bottles and to turn on the filling station accordingly. This will avoid overfilling or less filling of the bottles. The filled bottles continue to move on the conveyor belt until the capping station. The sensor at the capping station identifies the presence of the bottles and initiated the capping system. Once capped, the weight sensor attached at the bottom of the main conveyor belt identifies the large size bottles and opens the gate to divert the large size bottles to large size bottle conveyor to make it easier for packaging. The remaining small size bottles in the main conveyor are packaged separately*

Findings - *The operation of the PLC program is tested at each step and results are presented. The results shows that the program is implemented successfully*

Research limitations - *The developed simulation meets all the requirements.*

Originality/value - *The developed automated system can be used a case study to teach the PLC basics since all the major components counters, sensors, Indicator lights, switches, are incorporated.*

Keywords : PLC, AUTOMATION, BOTTLE FILLING AND CAPPING, LOGIXPRO

Lightning Activities during the COVID-19 Pandemic

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[1,2]Multimedia University

Abstract

Background - *COVID-19 has brought a drastic reduction in human activities since early 2020. Studies have shown that this has resulted in changes in air temperature and humidity. Since lightning activities are known to be dependent on air temperature and humidity, it would be interesting to investigate if there is any significant change in lightning activities during the COVID-19 pandemic.*

Purpose - *This study is conducted to evaluate the correlation between the intensity of lightning activities with the atmospheric changes, and investigates the changes, in lightning activities due to atmospheric changes during the COVID-19 pandemic. The hypothesis was tested through a t-test and Pearson's correlation study.*

Design/methodology/approach - *From March until July in Europe and Oceania, the total lightning strokes count (LSC) from the year 2015 to 2020 were obtained from LightningMaps (www.lightningmaps.org). The t-test is conducted by comparing the data from LSC from March to July in the year 2020 to the LSC in each previous year, which is 2015 to 2019. To further study the trend of lightning activity, the Pearson correlation study is also used to evaluate the correlation between the intensity of lightning activities with the atmospheric changes.*

Findings - *Statistical analysis shows the LSC in Europe during the lockdown period dropped significantly by more than 50% compared to the same period in previous five years while LSC in Oceania during the lockdown period decreased significantly by 18% and 44% compared with the same period in previous two years. Furthermore, LSC was found to be positively correlated with air temperature and relative humidity in Europe. However, in Oceania, LSC seems to be only positively correlated with air temperature but negatively correlated with relative humidity. This study seems to suggest that lightning activities have significantly changed during this pandemic due to reduction in human activities.*

Research limitations - *The findings are only applicable for the Oceania and Europe zones as LSC data could not be sourced for Asia.*

Originality/value - *This is the first time that a correlation study is attempted on lightning activities and the atmospheric changes due to reduction of human activities during the COVID-19 pandemic.*

Keywords : lightning activity, air temperature, relative humidity, COVID-19, correlation

Automatic Vehicle Fueling System using PLC Controlled Robotic Arm

Chitra Venugopal[1], Bhuvaneswari[2]

[1]Oregon Institution of Technology, [2]Thangavel

Abstract

Background - *The automatic vehicle fueling system is designed to overcome the issue of longer waiting time during peak hours. Also the during this pandemic situation, in person contact and exchange of payment system pose threat to the safety of the drivers and the fuel station worker. The automatic system explained in this paper is includes a back up manual intervention to counteract the automatic system in case of emergency and failures.*

Purpose - *The objective of this research is to design and develop the robotic arm for automatic fueling system using PLC LogixPro simulation. The system includes "FASS" concept which are Fast, Accurate, Safe and Simple in order to allow car users to have efficient fuel filling system.*

Design/methodology/approach - *The design is divided into 3 sections – identification of the vehicle, payment and filling the fuel. The first section identifies the presence of the car by the in floor weight sensors. The weight sensor identifies the car locks the in its position and activates the payment system. The second section activates the payment system. After payment is completed, fuel cap will be opened system to start filling the fuel. If the payment doesn't go through, car will be released, manual operation will be initialized, and the entire system will be reset. Timer is included in the payment section to process the payment. In the third section, the filling arm is extended to the car, fuel cap is opened, fuel pump is inserted into the tank and fuel is filled in the tank. Once the tank is full, filling is stopped, pump is ejected out, fuel cap is closed, and the arm return back to its position. Thus, automatic vehicle fueling system is created to overcome the problem of safety and longer waiting time during peak hours.*

Findings - *The operation of the PLC program is tested at each step and results are presented. The results shows that the program is implemented successfully.*

Research limitations - *The developed simulation met all the requirements*

Originality/value - *This innovative idea was implemented in simulation successfully according to the design procedure ready for real time implementation.*

Keywords : PLC, LogixPro, Automatic Vehicle Fueling System, Ladder Logic, automatic payment

Track: Mechanical Engineering

On Modelling and Optimization of Energy Consumption of Prototype Electric Vehicle

Andrew Tong Yew Tak[1], Lim Boon Kian[2], Alif Zulfakar Bin Pokaad[3], Liew Kia Wai[4]

[1,2,3,4]Faculty of Engineering and Technology, Multimedia University

Abstract

Background - *The Shell Eco-marathon is an international student competition where teams from all around the world compete to design and build the most energy efficient vehicle. Despite numerous participations from various universities, most of the teams lack a defined driving strategy, and rely on driver's intuition to drive their vehicles as seemingly efficient as possible.*

Purpose - *To create an optimized simulation model based on the Eco-V6, a battery-electric prototype vehicle built and raced by the MMU Gr10□3¼ne Welt team from the Faculty of Engineering and Technology, Multimedia University, Malaysia.*

Design/methodology/approach - *The simulation model, built in MATLAB and Simulink, contains the mathematical modelling of the powertrain, vehicle dynamics, track profile and the driver strategy of the vehicle. The track profile of Sepang International Circuit (south track), Selangor, Malaysia was defined by its slope angle and radius of curvature at each point of the track. A sequential quadratic programming (SQP) optimisation algorithm was formulated and applied to the driver strategy to obtain an optimised energy consumption value.*

tFindings - *The simulation model predicted an energy consumption value of 268.1 km/kWh, which is a 3.12% error as compared to the actual consumption value of 260 km/kWh. The error was considered as negligible and the model was deemed accurate representation of the real prototype. After applying the SQP optimisation, an optimised energy consumption value of 316.3 km/kWh was predicted, which showed a 17.98% increase in energy efficiency compared to the unoptimized energy consumption. The optimisation was deemed as successful in optimising the driving strategy of the vehicle.*

Research limitations - *Future work includes performing real life tests around the racetrack to further solidify the findings, performing tests at different racetracks, applying the SQP optimisation to the average vehicle speed to explore the possibility of having a lower energy consumption rate at a higher average vehicle speed, as well as performing constant speed strategy tests for future benchmarking.*

Originality/value - *The optimization model helps the team to understand how their vehicle performs in the simulation space, which allows them to quickly test the effects of changing certain vehicle parameters. The work may serve as a reference optimization model for teams participating in Shell Eco-marathon to further improve their vehicle's energy consumption.*

Keywords : Simulation, Optimization, MATLAB, Driving Strategy

Modelling Mode I Failure at Crack Tip with Verifications using Digital Image Correlation

Chee Kuang Kok[1], Eric Ren Wei Koh[2], Gooi Mee Chen[3]

[1,2,3]Multimedia University

Abstract

Background - *Linear elastic fracture mechanics (LEFM) has its limitation in modelling fracture with crack tip of zero width, although cracks in real life objects often have nonzero widths. The advancement in finite element method has enabled the calculation of stress intensity factor (SIF), regardless of crack shape and size. However, SIFs calculated in finite element commercial software, such as ANSYS, often differ from contour to contour.*

Purpose - *The aim of this work is to find a simple yet practical approach to predict Mode I opening brittle failure at crack tip using finite element method. In this work, experiments and simulations were conducted on brittle Poly(methyl methacrylate) (PMMA) plastic to compare the actual and predicted strain fields around the crack tip, and the critical force at which unstable crack growth initiates. The effects of mesh size and crack width on the simulated critical SIF were investigated.*

Design/methodology/approach - *A centrally straight cracked Brazilian disc made of PMMA was subjected to purely Mode I opening fracture in the experiment using Instron universal testing machine. Its strain fields were measured from deformed speckle patterns using GOM Correlate digital image correlation software. The critical SIF was first calculated based on an equation derived from LEFM. The same disc was modelled using plane stress model, assuming isotropic elastic material behaviour. By applying the critical force, the critical SIF was then computed using ANSYS fracture tool at different contours away from the crack tip. Mesh size and crack width were varied to investigate its effects on the predicted critical SIF and the stress/strain fields around the crack tip.*

Findings - *When failure is perceived to happen at the first sign of tensile yield at the crack tip, the critical force computed in the finite element model using triangular mesh agreed well with those obtained from the experiment and published literature. Digital image correlation clearly shows the occurrence of unstable crack growth at critical force. It also shows comparable far field strain responses, but the crack tip near-field responses deviate significantly from finite element model. Given the same mesh size, crack width has significant influence on the SIF predicted in the finite element model.*

Research limitations - *The findings are limited to Mode I fracture of brittle plastic such as PMMA. Other modes of fractures and mixed mode failures on any other material types require further investigation.*

Originality/value - *This work demonstrates that 1) Critical force predicted using LEFM agrees well with the experiment; 2) Although finite element model predicts variations in SIFs due to a change in crack width, the predicted SIFs may not be consistent with that predicted in LEFM; 3) SIFs predicted by finite element tool is very mesh sensitive, and differs significantly from contour to contour; 4) Strain fields around crack tip were better captured in digital image correlation than those in finite element models, and the agreement between DIC and models verifies the models.*

Keywords : Stress Intensity Factor, Mode I Fracture, PMMA, Crack Tip, Digital Image Correlation

Artificial Neural Network Modelling of 3D Printed Aluminium PLA Part

Chockalingam Palanisamy[1], Aaron Tay Hong Kiat[2]

[1,2]Multimedia University

Abstract

Background - *The need of quality 3D printed products increased. So the production of 3D printed parts with precise tolerances, better product surface roughness and overall durability. 3D printed parts are heavily impacted by the 3D printers processing parameters.*

Purpose - *Durability of 3D printed parts especially tensile strength is important and its effect on 3D printer process parameters must be examined. To predict the tensile strength an artificial neural network (ANN) model will be the ideal solution.*

Design/methodology/approach - *The parameters that are taken into considerations are layer thickness, infill density and number of shell. The three levels for each of the respective parameters; which are 0.1 mm, 0.2 mm, and 0.3 mm for layer thickness; 2, 3 and 4 for number of shells; 20%, 40% and 60% for infill density. Using the tensile test data an ANN model developed in MATLAB.*

Findings - *Once the result was obtained incate that the specimen with high layer thickness (0.3mm) and infill density of 40% is the best among all the other parameters. Finally, ANN model was developed based on the experimental data. for each testing methods and were used for random values of layer thickness, infill density and no of shells to see whether the values obtained from the tests fall in the range of experimental data.*

Research limitations - *The research is carried out with desktop 3D printer parameters which is having limited process parameters. Some other parameters such as printing orientation, and feed rate included in the research may have improved the accuracy of the results obtained.*

Originality/value - *Infill density and layer thickness are the two criterias are the significant factors that affect the tensile property. The number of shell is having least influence on the tensile property. However, the best tensile strength is by the part printed with higher infill density, more number of shells and higher layer thickness.*

Keywords : 3D Printing, ANN, Aluminium PLA

Response Surface Modelling of 3D Printed Bronze Part

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Abstract

Background - *3D printing is a dynamic process with a large number of process parameters influencing the product including the type of the material, and it is often difficult to understand the combination of these parameters. Tensile strength of the 3D printed parts are important for the functionality of components. The effects of process parameters on tensile strength must be examined. The objective of this study is to develop a Response Surface Model (RSM) in predicting the final quality of a 3D printed Bronze part from different set of input parameters.*

Purpose - *Tensile strength of the 3D printed are are important for the functionality of components, the effect of process parameters on tensile strength must be examined.*

Design/methodology/approach - *The tensile test specimen builds in Makerbot 3D printer with Bronze Polylactic Acid (PLA) material. Three controllable input parameters such as layer thickness, number of shells, and infill density with three levels such as layer thickness are 0.1mm, 0.2mm and 0.3mm; number of shells, 2, 3 and 4; infill density, 20%, 30% and 40% are used. The tensile experiment carried out to test the quality of the specimens. RMS is a mostly used statistical approach for modeling and analysing how different variable affect the response of interest and to optimise the response.*

Findings - *Once the result was obtained and observed, the specimen with high layer thickness (0.3mm) and infill density of 40% is the best among all the other parameters. Finally, regression equation was produced for each testing methods and were used for random values of layer thickness, infill density and no of shells to see whether the values obtained from the tests fall in the range of experimental data.*

Research limitations - *Some other parameters such as printing orientation, and feed rate included in the research may have improved the accuracy of the results obtained.*

Originality/value - *Infill density and layer thickness are the two criterias are the significant factors that affect the tensile property. The number of shell is having least influence on the tensile property. However, the best tensile strength is by the part printed with higher infill density, more number of shells and higher layer thickness.*

Keywords : 3D Printing, RSM, Bronze PLA

Track: Electronics

Development of an IoT Enabled Waste Monitoring System

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Abstract

Background - *Waste management is an important aspect to be addressed in Smart Cities embracing advanced technologies to preserve the city cleanliness. An effective waste management system can reduce the reliance on manpower required for routine checking and waste collection before the garbage bin is fully occupied. The advancement in Internet of Things (IoT) technology enables waste management to be carried out effectively.*

Purpose - *The traditional way of waste collection from garbage bin requires much effort from the janitors. This is because the process of identifying the full garbage bin has to be done manually. The work here aims to develop a smart waste management system based on IoT, that can track the level of waste in the bin and notify the user via the mobile application.*

Design/methodology/approach - *To realize this smart waste management system, the ultrasonic sensors were located inside the garbage bin at maximum height, which is interfaced to the microcontroller (NodeMCU). The mobile application (Blynk app) was deployed to access the sensor data through the IoT setup.*

Findings - *The proposed IoT system for monitoring the waste occupancy level in the garbage bin is able to perform its intended function. The readings obtained from the HC-SR04 ultrasonic sensors, which is an indicator of the waste level, were observed through the Blynk app. The data was analyzed using the gauge widget. The Blynk app will notify the users for the waste level, and the users will be alerted to full waste occupancy in the garbage bin.*

Research limitations - *The smart waste management system deploys the ultrasonic sensors to sense the waste occupancy level, without the capability of sensing the organic wastes, which would require special sensors to detect the unpleasant odors. The current system is intended for commercial implementations such as shopping malls and offices, which are not necessarily created for organic wastes.*

Originality/value - *The concept here is novel, deploying a low cost IoT enabled sensors setup to realize waste occupancy level monitoring and remotely making the data available to mobile users, so that waste collection can be carried out effectively. This is a smart solution towards a cost-effective waste management system for smart cities and buildings.*

Keywords : IoT, Waste Monitoring System, Ultrasonic Sensor.

Hearing Aid for Profound Deaf People by using the Concept of Audio Spectrum Analyser

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Abstract

Background - *An individual with profound deafness is unable to detect sound at all at any decibel level and are totally rely on lip-reading or sign language. Treatment based on cochlear implant is unpopular among the profound deafness people as it is very costly besides involving a risky and complex surgery. Furthermore, despite the recent advancement on hearing aids, there are still many limitations and inefficiencies in hearing aids for the profound deaf people. This research is motivated to address these problems and to develop a device that can stimulate "hearing" through skin sensory for the profound deaf people.*

Purpose - *This research aims to develop a device that stimulates "hearing" through skin sensory for the profound deaf people. The device converts an audible sound to a vibrating pattern by using the concept of audio spectrum analyser.*

Design/methodology/approach - *The audible sound will be picked up by a microphone and then amplified to a high level signal. These signals will then be fed to multiple audio filters and audio spectrum analyser to produce sound audio spectrum to drive multiple vibration on motors or actuators of the device. On wearing the device, the vibrating pattern stimulated on the skin sensory will be sensed by the subject. The subject would be able to learn these stimulated patterns of sound received over time and learn to distinguish different speech signals that brings familiarity and meaning to the subject.*

Findings - *As an initial experiment, a single sound vibrating transducer was developed and tested on 30 random people (subjects) involving normal, partial and profound deaf people. The transducer is strapped on to the subject's waist. Audible sound will be played (stimulus) and the subject will be asked to respond whether or not the subject is feeling a stimulation at the point and state the sound source direction. Based on the experiments, both normal and the partial or profound deaf subjects can feel the vibrating stimulation on their skin and state the directions accurately. This is a vital success of the test which is an important direction for future development of a hearing aid through human sensory skin.*

Research limitations - *The challenge still lies on how do the profound deaf people can interpret the various type of sound stimulated through their skin.*

Originality/value - *This is a novel study as there is no study done on producing human hearing aid through human sensory skin using the concept of spectrum analyser.*

Keywords : profound deafness, audio spectrum analyser, vibration, sensory

Effect of Clips Duration and Training Complexity in Video Classification Models

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Abstract

Background - *Computer vision is a widely growing field of artificial intelligence that trains computers to understand visual information. Training a video classification model can be a bit tricky when it comes to selecting the training dataset especially when the main target is to reduce the processing power and time while maintaining a high level of accuracy of the trained model.*

Purpose - *The main purpose of this study is to highlight the significance of choosing different video lengths in the training process of video classifications models in recurrent neural networks, RNN*

Design/methodology/approach - *To fine-tune the training process of a recurrent neural network that classifies videos depending on the ongoing activity within the video, we designed an experiment that evaluates the accuracy of different classes of training datasets that comprise different video lengths. Our method measures the training time that is needed for each class of clips and compares the result with the overall accuracy of the trained model. This approach gives us a measure of the video clip duration needed for a good prediction model while maintaining a minimum processing time*

Findings - *After comparing different training sequences and evaluating accuracy versus training complexity, it was found that the suitable clip length should be 3 to 10 seconds depending on the complexity of the classification goal. Simpler classifications may require shorter clips whereas a more complex visual behaviour requires a longer time frame to understand the behavioural pattern in the video.*

Research limitations - *The current approach examines the effects of the duration of the clip in one training strategy which takes image classification output and feed it to an RNN to observe the temporal changes. Applying a similar approach to optical flow classification models, for example, can eventually support the hypothesis and further validate this approach.*

Originality/value - *These findings can give fellow researchers basic guidance on choosing a suitable dataset and it can ease the process of data preparation and training process*

Keywords : Computer Vision, Deep Learning, Fine Tuning, recurrent neural networks, classification models

One Ringgit and Five Ringgit Malaysian Banknotes Reader Featuring Counterfeit Detection

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Abstract

Background - *Visually impaired persons face challenges in running business activities, especially in handling banknotes. Malaysia researchers had proposed some Ringgit banknote recognition systems to aid visually impaired persons recognize and classify Ringgit banknotes. However, these electronic banknote readers can only recognize Malaysian Banknotes' Ringgit value, they have no counterfeit detection features.*

Purpose - *The purpose of this study is to develop a banknote reader that not only can help visually impaired persons recognize the banknote value, but also to detect the counterfeit of the banknote, safeguarding their losses.*

Design/methodology/approach - *This paper proposed a Malaysian banknote reader using image processing technique to read and detect counterfeit for one ringgit and five ringgit Malaysian banknotes. The developed handheld banknote reader used visual type sensor to captured banknote image, passed to raspberry pi controller and Wi-Fi transceiver, directed the captured image via internet to a server to perform image processing on banknote value and the extracted watermarks features. The developed image processing algorithm will trace out the region of interests: 1)see-thru windows, 2)Crescent and Star, 3)Perfect see though register and detect the watermarks features accordingly. The processed result will be passed back to the handheld banknote reader and broadcast on an attached mini speaker to aid the visually impaired understand the holding banknote, whether it is a real one ringgit, real five ringgit or none of them.*

Findings - *The experimental result shown by this approach able to accomplish numerous round of banknote reading attempts with successful outcomes. Confusion matrix is further employed to study the performance of the banknote reader, in terms of true positive, true negative, false positive and false negative. Details analysis had been focused on the critical false positive cases (predicted real banknote and actually is fake banknote) and false negative cases (predicted fake banknote and it is actually real banknote).*

Research limitations - *The current developed banknote reader only limited to recognize RM1 and RM5 banknotes, because other values of Malaysian banknotes having different types of watermarks(e.g. RM 10-RM20 required tilting/rotating mechanism and RM50-RM100 required Ultraviolet light shooting mechanism).*

Originality/value - *This research aids the visually impaired handling banknotes with counterfeit detection features like normal people.*

Keywords : Circuit and System, Banknote Reader, Image Processing, Banknote Counterfeit, Ringgit Detector.

Track:
Robotics (outline)

SimMechanics Model and PD-FL Integrated Controller of 2-DOF Robot for Position Control

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[1,2,3]Multimedia University

Abstract

Background - *Position control in robotics has recently high attention in research in order to control industrial robots to perform several tasks such as welding, machining, polishing, pick and place, etc. There are many controllers were developed for position control of robots, but there is still a continuous improvement of such controllers in terms of simplicity and accuracy.*

Purpose - *The purpose of this research is to obtain the SimMechanics model of a two degree of freedom (DOF) robot and to propose a combined controller of proportional–derivative (PD) controller and fuzzy logic (FL) controller.*

Design/methodology/approach - *In this research, the SimMechanics model of the 2-DOF robot is obtained using MATLAB SimMechanics toolbox in conjunction with Inventor software. Then, the proposed PD-FL integrated controller is designed and simulated in MATLAB Simulink. The PD controller is widely used for its simplicity, but its performance is not satisfactory in some tasks. Furthermore, the FL controller is also easy for designing and implementation even by non-experts in control theory, but it has the disadvantage of long computational time for multi-input systems due to the increased fuzzy rules.*

Findings - *The FL controller is integrated with the PD controller to improve the performance. The PD-FL integrated controller is developed and tested to control the 2-DOF robot for point-to-point position control and also tip trajectory tracking (TTT), the proposed controller performed three different TTT: linear TTT, triangular TTT, and rhombic TTT. The PD-FL integrated controller demonstrated enhanced performance compared to the conventional PD controller in both point-to-point position control and TTT. Furthermore, the PD-FL integrated controller has the advantage of less fuzzy rules which helps to overcome the computational time issue of the FL controller.*

Research limitations - *The SimMechanics model generation is easier than the mathematical model derivation. However, the mathematical model is required to design some controllers.*

Originality/value - *The SimMechanics model of the 2-DOF robot was generated by MATLAB SimMechanics toolbox in conjunction with Inventor software. Moreover, The PD-FL integrated controller was developed which demonstrated improved performance and has the advantage of simplicity and less computational time.*

Keywords : 2-DOF robot, SimMechanics model, PD-FL integrated controller, position control

Track: Telecommunications Engineering

An Enhanced Broadband Class-J mode Power Amplifier for 5G Smart Meter Applications

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Abstract

Background - *With the tremendous increase in usage of smart meters for almost all industrial sectors and household purposes, their implementation is considered as a crucial challenge in the Internet of Things (IOT) world, leading to the demand for emerging 5G technology. As a large amount of data has to be communicated by smart meters efficiently in industrial/household IoT applications, there is a need for significant enhancement in bandwidth to increase the data transfer speed. It is familiar that Power Amplifier (PA) plays a major role in deciding the efficiency and bandwidth of the entire communication system.*

Purpose - *However, the harmonically tuned switching power amplifiers are restricted to narrow bandwidth, making them less appealing for broadband applications. Recently developed Class-J PA topology has proven its potentiality in obtaining good efficiency without compromising on linearity and wide bandwidth.*

Design/methodology/approach - *This paper presents a methodology to design a 3.5 GHz (i.e., sub 6GHz) Class-J mode PA topology using CGH40010F Wolf speed Cree Device in GaN technology. This research's main objectives are to determine the desired optimum source and load impedances of the transistor and to design the proper Matching Networks (MN) for obtaining Class-J mode PA operation to make it suitable for 5G wireless IoT/Enhanced broadband applications. With the target input and output impedances that are obtained from the load pull simulation the 3 types of lumped element based LC-matching networks were designed and updated by optimizing the network elements using optimization tool in ADS.*

Findings - *The simulation results reveals that the proposed Class-J PA provides 41dBm of maximum power output along with a Power Added Efficiency (PAE) of 67%, Drain efficiency (D.E) of 82% and a small signal gain of 13 dB at 3.5GHz centre frequency over a bandwidth of around 400 MHz with a 28V power supply into a 50 Î© load.*

Research limitations - *The efficiency and bandwidth can be enhanced further by fine tuning the matching networks.*

Originality/value - *The proposed Class-J mode PA in this research work can provide a possible solution for efficiency & linearity trade-offs over the desired bandwidth for 5G applications.*

Keywords : 5G,power amplifier, good efficiency, wide bandwidth, Class-J.

Review on Machine Learning Intelligent Reflective Surfaces for Beyond 5G Communications

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Abstract

Background - *With the expected full deployment of 5G in the coming years, the number of devices that are expected to be connected will also increase drastically. With more devices within a concentrated area especially at the last mile, higher interference is expected and more robust algorithms are required in the systems to mitigate the interference and ensure a smooth and noise-free communications.*

Purpose - *One of the technologies that has been seen as potential solutions to manage the interference level in wireless systems is the intelligent reflecting surfaces (IRS). IRS can be created manipulating the propagation channel into acceptable condition by using passive and programmable electromagnetic elements. However, the introduction of IRS can make the system a little bit more complicated. Therefore, in order to reduce the complexity of the calculation and to ensure the results will be efficient, machine learning can be deployed in solving the problems.*

Design/methodology/approach - *The objective of the paper is to evaluate the key issues and challenges of employing machine learning in IRS assisted wireless systems. The paper will be looking at what and how other researchers have model and formulate IRS for interference suppression in Beyond 5G wireless network. In addition, the paper will also be looking into machine learning incorporation in assisting the IRS to achieve the optimum solution.*

Findings - *The paper will commence with evaluating the needs of Beyond 5G wireless network and the potential interferences from the connected devices. This will be followed by formulating IRS as well as study on machine learning for interference suppression. The integration of the two technologies will be further investigated and comparative study of all the current research that have been carried will be studied in details.*

Research limitations - *At the end of the paper, a comparative study of IRS-based interference suppression in Beyond 5G wireless communication systems will be presented. Furthermore, machine learning methods to be deployed to further reduce the interference in a more optimal and efficient way will also be investigated.*

Originality/value - *The next step after this review will be to propose a new technique that can achieve a more desirable result and reduce the effect of interference further for Beyond 5G network The outcome of the paper is significant as this will give the insight of which area would be significant to improve and the future direction of the research specifically in machine learning assisted IRS interference reduction in Beyond 5G network.*

Keywords : machine learning, intelligent reflecting surfaces, beyond 5G

Wireless Power Transfer with Wave Diversity

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Abstract

Background - *Wireless power transfer is important for energizing and recharging devices cordlessly. Harnessing energy effectively from radio waves becomes a crucial task. It is known that diversities at the transmitting antenna and waves (i.e. simultaneous continuous waves with center frequencies separated apart) can enhance the radio frequency (RF) to direct current (DC) energy conversion. What remains unknown is the extent of which the wave diversity enhances the conversion gain. This study attempts to examine the RF-to-DC conversion gain of applying wave diversity.*

Purpose - *This paper investigates the effects of wave diversity on the energy conversion efficiency, and contributes the analytical expression that relate the conversion efficiency to the diversity count, i.e. the number of simultaneously transmitted sinewaves.*

Design/methodology/approach - *We adopt a theoretical approach to the problem. First, we derive and present a theoretical model that incorporates different forms of transmit diversity, i.e. antenna and wave diversities. This model then connects a RF-to-DC energy conversion model resulting from polynomial fitting on circuit simulation results. With the availability of these two models, we can determine the theoretical energy conversion gain of simultaneously transmitting multiple sinewaves.*

Findings - *The results prove that transmitting multiple sinewaves simultaneously result in diversity gain and higher energy conversion efficiency. Most importantly, the gain and conversion efficiency can now be theoretically quantified. For example, at certain RF power measured at the receiver circuit, the diversity gain of transmitting four sinewaves is 2.6 (as compared to transmitting single sinewave). In fact, both the diversity gain and conversion efficiency increase with the number of simultaneously transmitted sinewaves. In another example, the conversion efficiency of transmitting four sinewaves is 0.1 as compared to 0.07 of two sinewaves.*

Research limitations - *For future works, we plan to conduct physical experiments and collect experimental results to validate the theoretical results.*

Originality/value - *In summary, this paper present a novel analytical expression for wave diversity in the context of wireless power transfer.*

Keywords : wireless power transfer, energy harvesting, RF-to-DC energy conversion, energy conversion efficiency, transmit diversity

Design of Wideband Circular Slot Antenna for RF Energy Harvesting System

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Abstract

Background - *Low-power embedded devices are becoming increasingly popular in a variety of consumer and industrial applications. The increasing demand for continues power has led researchers into a promising renewable energy sources. Abundant radio frequency (RF) energy from various RF sources can serve as an additional source energy through RF energy harvesting (RFEH).*

Purpose - *Designing a compact antenna with wideband or multi-band characteristics, and a reasonable gain for RFEH application.*

Design/methodology/approach - *The antenna geometry consists of a circular ring radiating element filled with two orbital circular and rectangular slots. At the bottom plane, a pair of rectangular and semi-rectangular-circle slits are integrated. The proposed antenna is designed on a double layer 1.6 mm high FR4 substrate, having a dielectric constant (Ær) of 4.7 and a loss tangent (tanÎ´) of 0.02.*

Findings - *The antenna achieved 1.51 GHz frequency bandwidth amounting to 66.44% bandwidth percentage and resonate at 2.45 GHz with a -68.82 dB reflection coefficient (S11). The wideband antenna realized a maximum gain of 1.93 dBi, 2.6 dBi, 3.4 dBi, and 3.1 dBi at 1.8 GHz, 2.1 GHz, 2.45 GHz, and 2.65 GHz operating frequencies. The proposed design dimension on the printed board is 0.61Î»g x 0.68Î»g.*

Research limitations - *An Antenna integrated with RF-rectifier or rectenna is responsible for energy harvesting (EH). Designing a compact antenna with wideband or multi-band characteristics, a reasonable gain, and improved efficiency is needed for an efficient RFEH system.*

Originality/value - *The authors declared no conflict of interest regarding the originality of the proposed design.*

Keywords : RF energy harvesting (RFEH); microwave spectrum; circular and rectangular slot; defected ground structure; microstrip antenna; wideband antenna.

Multicarrier Modulation Waveform for 5G and Beyond Technology

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Abstract

Background - *Wireless network technology is moving towards the fifth generation (5G) where the number of connecting devices is expected to increase by a hundred folds or more, resulting in a large volumn of data traffic. Although the OFDM waveform is utilized in 4G to transmit data over the air, its high out-of-band emission (OOBE) makes it unsuitable to be adopted in 5G and beyond wireless networks where high data traffic densities are preevalent.*

Purpose - *The purpose of the research is to investigate alternative multicarrier modulation waveforms that are suitable for 5G and beyond wireless networks. The Generalized Frequency Division Multiplexing (GFDM) waveform is one such novel approach and will be analyzed here. GFDM is still a new and active field of research. The work here provides an independent analysis of its performance.*

Design/methodology/approach - *Firstly, the system model for the generation of the GFDM waveform is presented. Then, the structure of the generated GFDM waveform is analyzed and its performance in terms of OOBE and supported data rates are evaluated through Matlab simulation and compared with the OFDM waveform.*

Findings - *Simulation results show that the OOBE of GFDM is lower by up to 30 dB as compared to OFDM. Furthermore, its supported data rate improves by 18% as compared to OFDM when the carrier spacing is 15 kHz and the cyclic prefix duration is at 20% of one OFDM symbol period. This implies that, for a given bandwidth, the GFDM waveform is able to carry more data over the air as compared to the OFDM waveform, thus, improving the bandwidth utilization efficiency which is crucial at scenarios with high data traffic densities.*

Research limitations - *The problem of frequency synchronization is not addressed here and will be the focus in the following extension of this work.*

Originality/value - *To understand the working principles of GFDM.*

Keywords : Multicarrier modulation, GFDM, 5G

Substrate Integrated Waveguide 3x3 Butler Matrix for 5G MM-Wave Beamforming

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Abstract

Background - *A substrate integrated waveguide (SIW) Butler Matrix is designed based on a systematic approach by realizing bilateral edge walls vias to produce a beam-steering antenna. Waveguide mode propagation is allowed by these vias, which then operate as a waveguide wall that supports the current flow.*

Purpose - *Unlike conventional Butler Matrix, the proposed SIW design only requires a hybrid coupler and phase shifter without any crossover to form three adjacent beam combinations. It also has a low profile, lightweight, the capacity to conform to planar or flexible surfaces, and easy integration with planar circuits.*

Design/methodology/approach - *In this design, the SIW technique is applied to the hybrid coupler, one of the Butler Matrix components, and the substrate of Rogers R04350B with a thickness of 0.5257 mm and a dielectric constant of 3.66 is used.*

Findings - *The proposed circuit exhibits efficient Sii and Sij characteristics at 28 GHz with the value of -20.47 dB for return loss (S11), -3.9 dB for insertion loss (S21), -3.2 dB for coupling (S31) while -18 dB for the isolation (S41). The SIW Butler Matrix is designed in a planar structure where the hybrid coupler is connected to the 0º, -90º, and -180º phase shifter without any crossover. This design has resulted in a compact size, three-port Butler Matrix with a minimal loss. The phase difference at each respective output port of the Butler Matrix shows the value of 0º, -120º, and 120º. With acceptable measured gains, the antenna array fed to the Butler Matrix can radiate to three slanted beams., in the range of 3.1 dB for port 1 excitation, 4.8 dB for port 2 excitation, and 4.5 dB for port 3 excitation, where the radiated beams have the coverage between ±30 degree.*

Research limitations - *In Butler Matrix, the phase shifter will determine the desired beams based on the array factor. However, constructing a high-performing phase shifter is normally challenging and intricate. Thus, the SIW phase shifter is carefully optimized so that the matching between hybrid coupler and phase shifter is accurate.*

Originality/value - *The proposed beam steering has a promising outcome, and it is suitable for 5G communications, particularly with tracking capabilities.*

Keywords : substrate integrated waveguide, Butler Matrix, Three-ports, 5G

Design of a Quad-band Rectenna for Ambient Energy Harvesting from RF Electromagnetic Signals

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[1,2,3]Multimedia University

Abstract

Background - *With a major shift in environmental policy all over the world towards sustainable and green technological development, finding an alternative for the finite lifespan batteries which cause ecological pollution has been a topic of interest for researchers. As the number of ambient RF emitting sources has grown significantly, RF energy harvesting can be an efficient and economical solution in this regard. RF harvesting systems are compact and reliable under all weather conditions and can drive various sensor-based wearable IoT devices and remote monitoring systems regardless of day or night.*

Purpose - *The goal is to design a multiband RF energy harvester that can practically harvest energy in the Malaysian sub-urban environment in both indoor and outdoor conditions.*

Design/methodology/approach - *An RF spectral survey was conducted, and a new impedance matching network (RF filter + matching element) is implemented to improve the efficiency of the rectifying circuit under unpredictably changing conditions in the ambient. Second, within the operating frequency range of 0.8 GHz to 3 GHz, a compact antenna with high bandwidth is recommended. Finally, based on the analysis from the simulation results, the output is determined and the feasibility of the proposed RF harvesting system is discussed for the desired frequency bands. The design has discussed and taken into account the available ambient frequency, appropriate bandwidth, and other related parameters for RF energy harvesting.*

Findings - *The harvester's calculated RF-to–DC conversion efficiency is around 45% at a low input power of -27 dBm, which is consistent across all four RF frequency bands, and reaches 60% at -15 dBm.*

Research limitations - *The conduction loss of the impedance matching network of the proposed rectifier decreases the performance which can be mitigated by a T or Ï€ network using SMD components.*

Originality/value - *The proposed design consists of a new matching network and a quad-band antenna to fully exploit all available ambient frequency bands which is a unique approach to practical RF energy harvesting in Malaysia.*

Keywords : Quad band, rectenna, RF energy harvesting, RF spectral survey, IoT.

Adaptive Data Rate Algorithm in LoRaWAN for 5G Wireless Communication

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[1,2,3]Multimedia University

Abstract

Background - *Long Range Wide Area Network (LoRaWAN) is an emerging wireless communications technology that is capable to facilitate long distance connectivity to a substantial number of power limited devices despite possessing limited resources and employs the Adaptive Data Rate (ADR) scheme to quickly modify its transmission parameters in accordance to the link quality of the nodes. Although this technology huge array of benefits, it is worth mentioning that LoRaWAN exerts certain limitations when it comes to scalability.*

Purpose - *This paper is to investigate the ADR in LoRaWAN to adapts the change in link quality as well as to design and verify the enhancements and modifications that could be implemented on the ADR algorithm to their respective manipulated variables.*

Design/methodology/approach - *The performance of LoRaWAN and the legacy ADR scheme are investigated with respect to scalability in addition to different propagation loss models to emulate different environments via the MATLAB software. Further, a minimal threshold algorithm is implemedted for each Spreading Factor (SF) after distributing the nodes equally into 6 sets. Lastly, this work carrying out the performance analysis of the outgoing algorithm as well as outlining the enhancements that could be implemented in a pursuit to improve networking performance.*

Findings - *The performance of the proposed scheme has been analyzed and benchmarked against the existing scheme and other notable schemes as well. From the analysis being conducted, the proposed algorithm outperforms the current ADR scheme by 5% and exerts an increase of 15% in throughput.*

Research limitations - *However, LoRaWAN technology still possesses certain limitations in adapting to certain environments and deployments that effects the reliability as well as the efficiency of the communications.*

Originality/value - *Enhancing the ADR scheme in a single gateway environment in the worst-case scenario whereby the gateway carries the burden for all of the end devices. The proposed enhancement has managed to outperform the outgoing legacy ADR scheme. Finally, it is able to improve a staggering by 30% and the throughput of the network is further enhanced by 10%.*

Keywords : LoRAWAN; IoT; LoRaWAN; ADR; Spreading Factor

A Survey on the Impact of the Power Allocation Scheme on the Achievable Throughput under Imperfect SIC in NOMA System for 5G Networks

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Abstract

Background - *The non-orthogonal multiple access (NOMA) is one of the multiple access technologies that can improve the system's throughput in 5G networks. The power domain multiplexing scheme is adopted in NOMA to multiplex the users on the same radio resource, where the conventional orthogonal multiple access (OMA) system did not utilize the power domain sufficiently. The power domain is intentionally introduced in NOMA for user multiplexing to improve the system's throughput. The power allocation scheme should have a significant power difference for multiplexed users on the same channel.*

Purpose - *This work provides a comprehensive and mathematical analysis of the power allocation scheme that provides new insight into the development of the NOMA system under perfect and imperfect SIC. An exhaustive analysis is provided to illustrate the concept behind NOMA to assign more power to the user with the weak channel condition, which assists in the successive interference cancellation (SIC) performance. To develop a theoretical framework for understanding the relationship between the power allocation, SIC and SC using binary phase-shift keying (BPSK).*

Design/methodology/approach - *A fair power allocation scheme is employed to address this power ratio issue using mathematical simplifications. This work exemplifies the logic behind more power is allocated to the user with weak channel condition according to the NOMA concepts.*

Findings - *The most significant observation of this work is that the power ratio should be more than 50% of the power for the user with weak channel condition. The results demonstrate the adequacy of the fair power allocation scheme for increasing the throughput by 14% than the fixed power allocation.*

Research limitations - *Furthermore, this work examines the NOMA system with two user's scenarios for simplifications, and a user pairing scheme is required for a more significant number of users.*

Originality/value - *There has been an increased recognition that more attention needs to be paid to this power allocation scheme and its relationship between the SIC and superposition coding (SC). A deeper understanding of these techniques is required to improve NOMA system design.*

Keywords : Superposition Coding (SC), Imperfect Successive Interference Cancellation (SIC), Power Allocation (PA), Binary Phase Shift Keying (BPSK)

Algorithm of Radio Resource Allocation in Device-to-Device (D2D) Communication for 5G Networks

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Abstract

Background - *The popularity and the use of smartphones and other mobile devices is increasing and results in enormous amounts of data traffic. By implementing Device to Device (D2D) communication, the existing networks are able to be enhanced as they are both scalable and efficient. The deployment of 5G networks will enhance the user experience in terms of the latency and the connectivity of the devices.*

Purpose - *The main objectives of this research are to investigate the radio resource allocation in D2D 5G network, to analyze interference management in cellular channels with D2D pairs and to design the algorithm of radio resource allocation in D2D 5G network using MATLAB software.*

Design/methodology/approach - *An algorithm is proposed to strengthen the D2D system in terms of the interference management, signal noise ratio interference (SINR) and throughput of the system. The algorithm of the proposed system starts with the initialization of the network parameters in the system. Then, the cellular under test (CUE) devices are added in the cellular network along with the device under test (DUE) pairs.*

Findings - *The proposed algorithm is being compared with the existing algorithm and has been verified that the proposed algorithm can reduce the overall interference in the D2D system by an average of 42%. The overall SINR of the system has been verified and able to increase by 7% for the proposed algorithm compared to the existing algorithm. Lastly, the performance of the D2D system for the proposed algorithm has been demonstrated to increase by 36.35% compared to the existing algorithm.*

Research limitations - *In this paper, the challenges are integrating D2D communication into cellular systems as well as the use of resource management application and the radio resource allocation. The existing algorithms used a restricted and fair assignment which are not efficient.*

Originality/value - *The novel method and algorithm are sensitive enough with the changes of frequency bandwidth in order to utilize the full potential of the 5G networks. For a better transmission efficiency between the devices, the distance able to be minimized and it resulted a minimal value of interference.*

Keywords : Device-to-device (D2D), 5G, resource allocation, interference.

Investigation of Adaptive Data Radio for LoRaWAN-Based Infrastructure

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Abstract

Background - *In this digital era, a Long Range Wide Area Network (LoRaWAN) is one of the most prominent technique which using unlicensed band due to its potential in achieving a low power together with long-range communication. There are a set of configurable parameters and Adaptive Data Rate (ADR) mechanism which can be altered and used to achieve a reliable network performance under different link condition.*

Purpose - *This paper aims to investigate the impact of ADR in LoRaWAN infrastructure towards the network performance as the density of end devices and gateways are gradually increase which could give the impact towards the network reliability. Moreover, an enhancement algorithm is proposed to reconfigure the LoRaWAN's end devices distribution among different spreading factor (SF).*

Design/methodology/approach - *The simulation of LoRaWAN-based is performed for capture effect and end devices as well as for gateway scalability. In addition, the number of gateways deployed in a network is optimized in order to improve the network coverage. Lastly, the enhanced algorithm is implemented in order to improve the network performance.*

Findings - *The proposed enhancement algorithm is able to perform a SF re-allocation according to the adjustment of receiver sensitivity by iteratively increase the transmission power up to a certain limit. Furthermore, the enhancement algorithm is being compared with the conventional ADR mechanism which able to improve the packet extraction rate and reduce the packet error rate by an average of 10%.*

Research limitations - *The challenges are increasing amount of packet collision occurred within the network due to the exponentially growth of Internet of Things (IoT) application. As the number of packet collision increases, the success rate of uplink packet from end devices to gateway is greatly reduced.*

Originality/value - *It is show the improvement of network coverage when a huge number of devices are assigned with a higher bit rate. Additionally, the end devices are iteratively updated and improve their SF value in every iteration. Lastly, it can also improve the network coverage where more end devices will get a stronger signal with the gateway, thus having a good received signal strength indicator (RSSI) value which constitute the devices to transmit with a higher bit rate.*

Keywords : LoRaWAN; Spreading Factors; Adaptive Data Rate; Capture Effect.

Design of a broadband Long-Range RF-Rectifier Circuit for Harvesting Ambient Energy

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Abstract

Background - *RF energy harvesting (RFEH) is a novel approach for generating direct RF power or charging and recharging of batteries using ambient electromagnetic (EM) sources. It comprises an antenna and RF-rectifier that collectively transform radio frequency (RF) signals to accessible dc sources.*

Purpose - *To design and analyze a broadband RF-rectifier that can support a wide range of RF input power in order to increase the reliability of the RFEH module.*

Design/methodology/approach - *The RFEH module proposed in this designed comprises two segments. Each segment comprises a resistance compression network (RCN), open and short-circuited impedance transformer stub linked to the rectifying diode through a series impedance transformer.*

Findings - *The proposed design frequency range from 1.78 GHz to 2.62 GHz can operate and harvest within the available RF signals of GSM-1800, UMTS-2100, ISM-2.4, and LTE-2600 spectrum bands. The impedance matching network (IMN) transformed the input impedance from a pair of a single section voltage multiplier to approximately 50 Ω. A 50 Ω transmission line (TL) connects the two broadband rectifier segments through RCN, and the circuit is terminated with 2 kΩ terminal load (RL). The proposed design realized a maximum RF-to-dc power conversion efficiency (PCE) of 76.52%, 71.9%, 68.6%, and 65.5% at the respective frequencies of 1.83 GHz, 2.10 GHz, 2.40 GHz, and 2.60 GHz for an input power of 10 dBm. The RF-rectifier realized a maximum output dc voltage (Vc) of 2.1 V for 10 dBm input power and 1.83 GHz.*

Research limitations - *The RF-rectifier is an important segment of RFEH system because of the weak ambient signal level harnessed by the antenna.*

Originality/value - *A unique technique is demonstrated in the proposed RF-rectifier design using a wideband resistance compression network (RCN). The approach enhances the circuit's matching perfromance that resulted in an improved efficiency over a wide range of input power and frequency. The RFEH module is designed using two segments. Each segment comprises an RCN, open and short-circuited impedance transformer stub linked to the rectifying diode through a series impedance transformer.*

Keywords : RF energy harvesting (RFEH), impedance matching network (IMN), resistance compression network (RCN), power conversion efficiency (PCE), broadband rectifier

Track: Photonics

Distributed Heating Effect on Serial Dissimilar in-Line Mach-Zehnder Interferometer

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Abstract

Background - *Dynamic or reconfigurable spectral response of optical fiber devices is becoming a necessity in many potential future applications, such as future elastic optical networks and Artificial Intelligent (AI)-assisted optical sensings. In particular, abrupt tapered structure is an excellent candidate as a mechanism for reconfiguring spectral response due to its unique interferometric structure and spectral properties that allow simultaneous exploitation of its power and wavelength shifts. However, it is essential to first explore and understand what formation and method that enable tailoring and controlling its spectral response.*

Purpose - *In this paper, abrupt taper structures forming a serial dissimilar In-line Mach Zehnder Interferometer (ILMZI) under the effect of distributed heating are systematically studied.*

Design/methodology/approach - *A serial dissimilar ILMZI based on abrupt tapered fibers with different interferometric lengths (i.e. Mach Zehnder interferometer arms) was fabricated on a single-mode fiber by using a high precision optical fiber fusion splicer. An ILMZI is formed by pairing two tapered segments with a specified gap along an optical fiber. In this work, two ILMZIs with interferometric lengths of 45 mm and 40 mm, and exhibiting distinctive spectral responses, are connected in series. This combination of specially designed ILMZIs allows one ILMZI to vary its spectral response profile when integrated with the spectral shift of another ILMZI. The first ILMZI (interferometric length of 45 mm) was applied with distributed temperature values from 20 °C to 130 °C by a digital hot plate for inducing spectral shift.*

Findings - *The results reveal that a wavelength shift of up to 6.7 nm from the first ILMZI with a coefficient of 0.0587 nm/°C was able to produce an optical power profile variation of up to 3 dBm within a narrow wavelength range of the resultant transmission spectrum of the serial ILMZI. The results demonstrate that a serial dissimilar ILMZI with variable heating has the capability to specify a wavelength range and modify the optical power solely within that band of the spectral response.*

Research limitations - *Measurements were limited to a temperature value of only 130 °C as a precaution to prevent the adhesive tape from shrinking.*

Originality/value - *This work introduces the concept of reconfigurable non-uniform serial ILMZI, which opens up the possibility of myriad designs of optical fiber devices to achieve controllable and wavelength-selective spectral shaping of optical devices.*

Keywords : Mach-Zehnder interferometer, Distributed heating, Abrupt tapered fiber

Point Force-to-Distributed Uniform Strain Conversion Based on Modified Cantilever Transducer for Fiber Optic Sensors

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Abstract

Background - *Fiber Bragg grating (FBG) is widely known for its ability to be used in various field of applications. In optical sensing applications, FBG is usually paired with a transducer to transfer a desired parameter to be measured (i.e. measurand) to the FBG that will subsequently experience spectral shift. The transducer functions to convert the measurand, which otherwise could not be directly detected by the FBG, into either strain or temperature that influences the FBG structural and spectral responses.*

Purpose - *The purpose of this paper is introducing a transducer that is capable of transforming a point force into uniform strain distribution over the length of an FBG through simulation demonstration. One of the potential applications that is benefited from this type of transducer is the pantograph-catenary interaction in electrified railway.*

Design/methodology/approach - *This paper adopts cantilever structure as it allows the pantograph to be able to move freely when pressed by the catenary during its operation, and subsequently transferring the point force as strain to the FBG sensor embedded in the cantilever. However, the strain produced by conventional cantilever will have non-uniform distribution, causing distortion to the FBG spectral response and measurement inaccuracy. The design approach used in this paper focuses on tailoring the profile of a cantilever to make it distribute strain evenly throughout its bending action. This paper will use Solid Edge software for simulating and desiging a cantilever in its application.*

Findings - *The conversion of point force-to-distributed strain on the specially modified cantilever design is analyzed and shown against the conventional cantilever to validate its capability. The analysis reveals that by linearly tapering the width of the cantilever, the strain upon bending due to application of point force will be uniformly distributed along the structure.*

Research limitations - *This work only involves device modelling.*

Originality/value - *This design approach is importantly useful for FBG sensors, as it has removed the restriction on the FBG length in designing FBG sensor transducers, and thus enabling various long-length types of FBG, such as chirped FBG and superstructured FBG, to be used for sensing.*

Keywords : Fiber Bragg grating, Pantograph, Catenary, Cantilever, Transducer, Fiber optic sensors

Track: Optical and Converged Optical-Wireless Networks

Performance Analysis of Relay-Assisted Free-Space Optical Communication Links

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Abstract

Background - *Atmospheric loss and turbulence effects are responsible for performance degradation of free space optical (FSO) communication systems at the time of sending data using optical lasers. In this research part, there is an aim to examine and improve mentioned channel effects with the assistance of relay by considering cost efficient, cableless, high speed data transferring features of FSO through the atmospheric medium.*

Purpose - *The objective of this research project is to study and optimize the performance of relay-assisted FSO communication systems under different weather conditions resulting turbulence and various atmospheric losses.*

Design/methodology/approach - *Here analysis and performance testing method is simulation study, which is carried out using MATLAB by considering turbulence effect, atmospheric losses and channel effect. In terms of quantifying performance, bit error rate (BER) is analyzed. On top of that, performance enhancement is justified by a relay assisted FSO system.*

Findings - *The overall performances of the proposed system have been analyzed in terms of the relay node optimization and changing of aperture diameter for BER vs consumed optical power considering six types of weather conditions. Firstly, for clear weather and moderate rain under 10 km and 5 km link distances, as the no. of relays increased, consumed optical power gradually requires less. For light, moderate and heavy fog conditions considering 1 km, 4 km and for haze 4 km, 8 km propagation distances, performance variations are observed for different no. of relays and aperture diameter.*

Research limitations - *Formulating and implementing a complex equation on a MATLAB simulation, one of the vital steps which need to perform carefully. In this research study, pointing errors have not been considered. This should be investigated in future in order to provide more concrete analysis of the FSO channel.*

Originality/value - *The effect of relay nodes and aperture diameters are jointly considered in this study for the betterment of communication performance.*

Keywords : Free-space optical (FSO) communication, atmospheric turbulence, bit error rate (BER), relay

Track: Engineering and Technology

Zone-Based Indoor Positioning System using Fingerprinting Localization with Neural Networks

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Abstract

Background - *Wi-Fi RSS fingerprinting positioning technique is widely used for Indoor Positioning System (IPS) because of the ready-to-use Wi-Fi infrastructure.*

Purpose - *This paper presents a zone-based IPS using Wi-Fi RSS fingerprinting positioning technique with Probabilistic Neural Network (PNN) and Radial Basis Function Neural Network (RBFNN) to predict target positions in an indoor environment.*

Design/methodology/approach - *The indoor environment involves office rooms and laboratories separated by concrete walls. In the environment, four Wi-Fi Access Points (APs) had been separately placed, and coordinate system has been used to represent each location. In the study, the environment has been separated into 27 zones according to a floor plan.*

Findings - *At each location, the value of Received Signal Strength (RSS) from each Wi-Fi AP will be recorded and labelled with respective coordinate and zone value to obtain a fingerprinting database. Furthermore, the fingerprinting database will be separated into three sets. Cross-validation has then been conducted to study the performance of PNN and RBFNN on coordinate prediction and zone prediction. On coordinate prediction, PNN shows a mean positioning error of 3.84m, which is 3.07m smaller than RBFNN. Whereas on zone prediction, PNN and RBFNN both have achieved the zone prediction accuracy of 82.2% and 78.7%, respectively. In conclusion, PNN performs better than RBFNN in both types of prediction. Besides, the zone prediction made by PNN has presented an accuracy higher than 80%, which shows the potential of PNN to be adopted for the development of IPS that targets for zone-based positioning applications.*

Research limitations - *The current work focuses on the one floor level of a faculty building. However, the floor plan structure is complex enough for the study. In the future works, the data collecting process can be automated by developing an automatic data collecting system for larger study area.*

Originality/value - *This work has presented the positioning performance comparison between PNN and RBFNN, on predicting the target location in the indoor environment for two aspects: coordinate prediction and zone prediction.*

Keywords : Indoor Positioning System (IPS), Probabilistic Neural Network (PNN), Radial Basis Function Neural Network (RBFNN), Fingerprinting

Study of Missing Data Recovery Mechanisms for Phasor Measurement Unit (PMU)

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Abstract

Background - *A Phasor Measurement Unit (PMU) is a monitoring device used to monitor the power supply (e.g. phase, voltage, current) in smart grids. Data from PMUs are analyzed in either real-time or batch mode and used to fine-tune the grid's performance. PMU generates a large volume of data and at a high velocity, thus any missing data can affect the effectiveness of the PMU.*

Purpose - *Missing PMU data impacts the decision-making capabilities which may potentially lead to incorrect decisions or blackouts. This paper presents, a state-of-art review of related data recovery methods along with their performance evaluation for real PMU data adopted from the state load despatch center in Madhya Pradesh, India.*

Design/methodology/approach - *A few techniques that include substitution–mean, moving window-based mean, linear interpolation, cubic spline, matrix completion, Bootstrap Expectation-Maximization (EMB) algorithm, Multiple Imputation Chained Equation (MICE), and Random Forest (RF) algorithms are reviewed. Performance analysis of these methods provides a better understanding of their suitability in recovering missing PMU data.*

Findings - *From the initial analysis, both cubic spline interpolation method (CSM) and matrix completion method (MCM) performed relatively well. This was determined after applying real PMU data on all techniques and then measuring the resulting Root Mean Squared Error (RMSE) and Time of Computation (ToC) values. For example, the RMSE values of CSM and MCM are about 1.43 and 4.4 respectively while substitution-mean shows 14.312. Similarly, ToC for CSM and MCM are averaging at about 0.6 seconds and 2.0 seconds, respectively, while both MICE and RF take about 1062.19 seconds.*

Research limitations - *In our study, we only examined the accuracy and TOC of these techniques. In our future work, we intend to look into the algorithmic complexity and methodologies to handle existing data and to handle large real-life and recurring data efficiently.*

Originality/value - *This paper presents an analysis of related works based on performance comparison using real PMU data for the selection of suitable methods to recover missing PMU data.*

Keywords : Phasor Measurement Unit, Missing data, Data recovery, Smart grid

Emotion Recognition using Decision Tree with Selected Statistical Electrocardiogram Features

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Abstract

Background - *In recent years, the use of physiological signals such as electrocardiogram (ECG), electromyogram (EMG) etc. has garnered interest in applications of affective computing in smart home systems containing emotional state recognition.*

Purpose - *Emotions are complex phenomena that play important roles in the quality of human life. But recognizing the emotions accurately is a major challenge. A system which is capable of identifying emotions automatically can be able to narrow down the communication gap between computer and human.*

Design/methodology/approach - *An attempt is made in this research to device a method to recognize human emotions more accurately. The proposed method is formed by combining Principal Component Analysis (PCA) and Decision Tree (DT) classifier (PCA-DT), where PCA is used as a feature selection technique for dimensionality reduction purpose. A special dataset is prepared by extracting heart rate variability (HRV) features from time domain, frequency domain, and nonlinear domain of ECG signals by using the neurokit2 tool. This dataset is used to train and test the proposed method PCA-DT.*

Findings - *It is found that the the performance of PCA-DT, in terms of predicting the emotional level of arousal, valence, and dominance, is better than the other machine learning (ML) techniques such as multi-layer perceptron (MLP), Support Vector Machine (SVM), Gradient Boosting Decision Tree (GBDT) and Logistic Regression (LR). Data dimensionality reduction and noise removal abilities of PCA enabled the decision tree classifier to perform better than other classifiers.*

Research limitations - *The less amount of available data prevented the inclusion of deep learning in this research even though deep learning models give better performance.*

Originality/value - *The inclusion of PCA in the decision tree classifier not only speeds up the computation by reducing the dimensionality of the data but also removed the noise effectively. Hence the proposed method PCA-DT is more suitable for the implementation of emotion recognition systems in applications like patient health monitoring, driver's attention monitoring and so on.*

Keywords : Emotion recognition, PCA, decision-tree classifier, machine learning, ECG signal

Simulated Kalman Filter – Five Years Later

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Abstract

Background - *Simulated Kalman Filter (SKF) solves optimization problems by finding the estimate of the optimum solution. As a multi-agent algorithm, every agent in the population acts as a Kalman filter by using a standard Kalman filter framework, which includes a simulated measurement process and a best-so-far solution as a reference.*

Purpose - *This paper presents an overview of the research progress in SKF from the day it was introduced until the present day. This estimation-based technique has attracted many researchers due to its simplicity and effectiveness, led to many improvements and modifications of the basic SKF algorithm.*

Design/methodology/approach - *This paper discusses the progress of SKF, improvements, modifications, and applications. The fundamental and standard algorithm is first introduced. Then the work on the algorithm improvements during the past five years is surveyed. Research on the hybridization of SKF with other evolutionary techniques and applications on multi-objective optimization is also included. Finally, the remaining unresolved problems and some directions of SKF research are discussed.*

Findings - *59 SKF papers have been reviewed. Since SKF algorithm was introduced to solve continuous optimization problems, few methods have been proposed to accommodate discrete domain. Efforts were made to make SKF a parameter-less algorithm. SKF has a fast convergence rate. Some researchers work on ideas to improve exploration capability to prevent premature convergence by introducing prediction operators, introducing opposition-based learning, and even try different iteration strategies. There are also attempts to hybrid SKF with other famous algorithms such as Particle Swarm Optimization (PSO), Gravitational Search Algorithm (GSA), and Sine Cosine Algorithm (SCA) to improve its performance. Researchers who favor the fast convergence behavior introduced an exponential term to speed up its convergence further. Finally, a single-agent variant of SKF and a multi-objective SKF were introduced. Due to their excellent performance, SKF and its variants have been implemented in at least ten areas of applications, drill path optimization, adaptive beamforming, airport gate allocation problem (AGAP), assembly sequence planning (ASP), feature selection, image matching, parameter estimation, parameter tuning, wireless sensor network, and structural design.*

Research limitations - *The literature reviewed solely depends on the keyword search that contained the terms simulated Kalman filter from December 2015 to the present date.*

Originality/value - *This is the first review paper on SKF.*

Keywords : SKF, Optimization, Review, population-based, single-agent

Microarray Gene Expression Breast Cancer Classification using Machine Learning Method

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Abstract

Background - *Breast cancer is one of the leading causes of death and most frequently diagnosed cancer amongst women. It affects patients that live in average living condition that must go beyond expensive and distressing medications. The disease involves one in eight women worldwide. Annually, almost half a million women do not survive the disease and die from the cancer.*

Purpose - *Machine learning is data analysis methods that is efficiently demonstrated good solutions and outperforms other results in predicting breast cancer using built on previously trained data. In this work, multi-machine learning method is applied for microarray gene expression breast cancer classification.*

Design/methodology/approach - *The data is processed prior to classify using machine learning method. The machine learning methods utilised are support vector machine (SVM), random forest (RF), decision tree (DT), logistic regression (LR), k-nearest neighbors (KNN) and gaussian naÏve bayes (NB). The classification rate is compared among the classifiers applied.*

Findings - *Experimental result shows some of microarray breast cancer classification able to demonstrate good accuracy rate. However, the classification performance rate according to the dataset size and ratio of classes. For instance, GSE1456 using SVM, and RF classifier showed highest rate of 81.25% and 75% classification accuracy respectively. Whereas GSE1456 yielded poorest classification rate respectively 60.3% and 63.7% using using SVM and RF classifier.*

Research limitations - *The microarray breast cancer comes with large number of features with small sample size, the dataset dimension should be reduced to gain better classification rate prior to classification using machine learning method.*

Originality/value - *This work evaluates mutli-classifiers for breast cancer classification using microarray data. The finding is useful in development of microarray-based breast cancer classification system.*

Keywords : microarray gene expression breast cancer, machine learning models, classification.

Application of Fuzzy Logic to Bed Pressure Control in Fluidized Bed Granulator

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Abstract

Background - *Fluidized bed granulation process is a complex process with a multiple inputs and outputs. This paper investigates the application of fuzzy logic control system to control bed pressure in fluidized bed granulator.*

Purpose - *The aim of this study is to minimize ammonia release for increasing the quality of urea granules and lower down the risk on environmental problems.*

Design/methodology/approach - *By using the ammonia release and inlet temperature as the inputs, the fuzzy logic has been designed using the Fuzzy Logic Toolbox of Math works Matlab 2015a to control the bed pressure. The simulation of the system was performed using Simulink to compare the output with the actual bed pressure.*

Findings - *As the results, the output from the fuzzy logic controller and the simulation of the system was compared with the average error of both output which are 11.06% and 6.39% respectively. The findings of this works has proved that the application of fuzzy logic in fluidized bed granulation is capable to minimize the ammonia released by controlling the bed pressure.*

Research limitations - *The focused parameters in this work is pressure inside the chamber of fluidized bed granulator. ToxiRae II was used to measure the amount of ammonia released.*

Originality/value - *The model developed enable the use of producing urea in batch with advance parameter setting in order to achieve very least waste and environment pollution. This led to an improvement in the green processing of bio fertilizer in a healthy environment industry.*

Keywords : urea granule, fluidized bed granulation, fuzzy logic, ammonia gas.

Implementation of Student Course Evaluation: Pandemic Impact on the Non-Constraint Engagement (NCE) Model

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Abstract

Background - *Traditionally, students' feedback in the form of Student Course Evaluation (SCE) has been paper-based and made mandatory on students. Even when SCE is made online and voluntary, one major obstacle is low response rate. The Non-Constraint Engagement (NCE) Model is a newly introduced method in enhancing SCE in our institution, that attempts to overcome these limitations.*

Purpose - *This study aims to examine the stability and sustainability of the NCE model implementation before, during and after the peak of the first wave of the COVID-19 pandemic.*

Design/methodology/approach - *The NCE Model was initially piloted between 2014 and 2015. To test its feasibility and sustainability, an SCE exercise was implemented for undergraduate students from the Faculty of Engineering, Faculty of Applied Science and Technology (FEAST), Faculty of Architecture and Interior Design (FAID), Faculty of Management and Faculty of Communication, Arts and Sciences. SCE was performed via Moodle in the online Learning Management System (LMS) before mid-term of each semester. Various activities were carried out to engage with students and increase their awareness on the importance of giving feedback.*

Findings - *Results showed high and stable response rates, despite SCE being voluntary. Students demonstrated enthusiasm to participate when they felt a sense of responsibility and greater agency. Success factors of the NCE Model implementation were engagement, performance monitoring and closing of performance loop. The NCE model was sustainable irrespective of the pandemic impact, and this could be attributed to external factors (eg: high vaccination rate in Dubai) and internal factors (eg: corporate social responsibility).*

Research limitations - *Given the prolonged nature of COVID-19 pandemic, it is not known if similar rates of response and engagement could be maintained long-term.*

Originality/value - *This study introduces a new approach, the NCE model, which can be tested in other educational settings to enhance SCE.*

Keywords : non-contraint engagement; performace monitoring; student course evaluation; non-gated process; closing of performance loop

Design of Low-Cost IoT Smart Agriculture System

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Abstract

Background - *The world's population began growing exponentially especially in the last century. More food is needed to support the growing population. Developing a smart agriculture system is a promising solution to increase food production. The existing smart agriculture system is too costly for small-scale farmers. A low-cost smart agriculture system for small-scale farms is proposed in this work.*

Purpose - *The smart agriculture system is an enhanced version of the traditional farm by implementing the 20th century's technology. The objectives of this project are to design a low-cost automated smart agriculture system using the Internet-of-Things (IoT) technology to monitor and control the soil's moisture and fertility level.*

Design/methodology/approach - *ESP8266 microcontroller is used to control the irrigation system that consists of a soil moisture sensor, thermal probe, and water pump. The soil's fertility level is measured using the pH sensor. The data collected from the IoT sensors are uploaded to the ThingSpeak cloud database through WiFi. Blynk app is used to control and access the system on the smartphone. Extensive experimental works are carried out to evaluate the performance of the system. The optimal operation condition to configure the system is summarized in this work.*

Findings - *A prototype of the low-cost automated smart agriculture management system is developed at the end of this project and the implementation details are reported in this work. The implementation cost of the system proposed is USD 46. The smart agriculture system proposed significantly reduces the water consumption by 85% lower compared to the conventional watering timer system. The system proposed is proven to have a lower water consumption and a better crop growth rate.*

Research limitations - *The system proposed needs to preprogram the WiFi, Blybk, and ThinkSpeak details first before using it. The system is used in a wet and hot environment, the durability of the sensors remains an issue. High durability sensors can be used to maintain the system's performance.*

Originality/value - *The new low-cost IoT smart agriculture system with irrigation and soil fertility monitoring system is proposed in this paper. The system proposed significantly reduced the water consumption, monitor the soil's fertility, and improves the crop growth rate for a small-scale farm.*

Keywords : Smart Agriculture, Internet of Thing, Fertility

Design of a Rainy Lane Detection System using Deep Learning Approach

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Abstract

Background - *One of the essential elements of road safety analysis is lane detection. From image processing method to machine learning method, now deep learning method has been used to ensure that the lane detection is effective in real-time situations.*

Purpose - *Malaysia is a tropical country that experiences a vast amount of rain in a year. Thus, a lane detection system that can work well in such conditions is needed. This project focuses more on designing lane detection systems that can work in rainy conditions by utilizing the deep learning approach.*

Design/methodology/approach - *Convolutional Neural Network will be the main algorithm used in this project. CNN architecture, VGG16, is chosen because of its deep layer and built-in pre-trained library in Keras. This project's dataset is taken from an online platform that is Berkeley DeepDrive (BDD100K). Decoder-encoder CNN is implemented in the neural network of the proposed model. This paper also highlights the pre-processing and post-processing methods that help improve the accuracy of the model.*

Findings - *With suitable pre-processing and post-processing techniques such as augmentation techniques and drop out in input and hidden layers, we can improve the model's accuracy. We used VGG16 to train a dataset of 500 images and 200 images for validating purposes. EarlyStopping and ModelCheckpoint functions that are available in Keras library help us to avoid overfitting. In this paper, Stochastic Gradient Descent (SGD) optimizer is used, and a custom loss function is defined to improve the model's accuracy. The VGG16 algorithm helps the model to extract more features to train as it is popular as a deep convolutional layer algorithm and reduces the training time by utilizing the pre-trained library.*

Research limitations - *The dataset's amount is smaller than other lane detection datasets affecting the model's accuracy and loss. The condition of the road, such as bumping effects, influences the detection of the lane. The lane detection in rainy weather is often affected by wipers causing a distraction to the camera.*

Originality/value - *Lane detection system using VGG16 with pre-processing and post-processing while implementing a small dataset is designed. The system managed to achieve above 90% accuracy with a 0.1774 loss.*

Keywords : Lane Detection, Convolutional Neural Network, VGG16

AC Impedance Measurements on PAN Polymer Electrolytes Doped With SiO_2 Filler

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Abstract

Background - *Polymer electrolytes have proven to be a promising candidate in replacing conventional liquid electrolytes in development of batteries industries. This mainly due to the absence of liquid in the structure, which has eliminated the leakage problem which causes safety concern as frequently suffered in liquid batteries. Various types of host polymer have been studied in the fabrication of lithium ion batteries, such as PMMA, PAN, PEO, PVdF etc.*

Purpose - *In this work, PAN polymer is chosen since this polymer poses a higher ionic conductivity at room temperature, good electrochemical stability and high lithium transference number. PAN based polymer electrolytes with SiO_2 as filler are prepared to study the AC impedance.*

Design/methodology/approach - *A PAN – LiCF3SO3 dry electrolyte film and two PAN – LiCF3SO3 –EC–SiO_2 composite electrolyte films each incorporating 12 nm SiO_2 filler and 10 µm SiO_2 filler respectively are prepared through solution cast method. DMF solvent is added into each set of powder mixture followed by stirring at room temperature for 24 hrs. Each solution is then cast onto petri dish to allow slow evaporation for 5 days in room temperature before drying in oven at 60°C for 5 hrs.*

Findings - *The produced films are trimmed into 3 samples with equal area for further characterization. Based on ionic conductivity measurement, composite polymer electrolytes with 12 nm SiO_2 filler gives ionic conductivity up to 5.16×10^{-3} S/cm while 10 µm SiO2 filler gives slightly lower ionic conductivity value at 3.48×10^{-3} S/cm. The ionic conductivity for dry polymer electrolyte film gives lowest ionic conductivity of 1.26×10^{-4} S/cm.*

Research limitations - *This work performed a detailed AC impedance measurement, specifically on the ionic conductivity measurement of the polymer electrolyte film.*

Originality/value - *The highest ionic conductivity obtained in this work is in the range of 10-3 S/cm at room temperature. This value is appreciable for a typical application of PAN based polymer electrolyte in lithium ion battery. This project is funded by IR Fund 2021 (MMUI/210019).*

Keywords : PAN, SiO2, polymer electrolytes, ionic conductivity

Low-Cost Automated Mobile Medication Dispenser for Elderly

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Abstract

Background - *The tremendous increase of the population aged 65 and above created a new challenge of how to take care of the elderly. The shortage of health care workers to take care of the high number of elderly. The elderly who have multiple chronic conditions face problems in managing their medication intake. An effective, low-cost, user-friendly, cloud-controlled, mobile medication dispenser is urgently needed to take care of the medication intake of the elderly.*

Purpose - *The purpose of the research is to design a low-cost automated mobile medication dispenser to dispense medicine on time for the elderly. Low-cost electronics components and free open-source software are used in this project to reduce the design cost of the medication dispenser.*

Design/methodology/approach - *The system consists of two parts: hardware (medication dispenser framework) and software (apps for medication dispenser). Arduino IDE programs NodeMCU is used to control the stepper motor, organic light-emitting diode (OLED), and motor driver. OLED is programmed to display the current time and the time set by the user to take their medicine. NodeMCU is connected to the Firebase database to fetch data of the time to take the medicine. The medication dispenser is equipped with 2 wheels to enable it to move and dispense the medication to the elderly.*

Findings - *The medication dispenser which contains multiple slots to store the pills was designed to automatically dispense the pills. An app was created as an interface for the user. The user can program the time to dispense the medication. NodeMCU receives the time programmed by the user through the app. The medication dispenser is equipped with 3 wheels and the elderly can remotely control its movement. The proposed low-cost medicine dispenser is affordable for the elderly from the lower-income group and makes the process of taking medicine not a hassle for the elderly.*

Research limitations - *The mobility of the medication dispenser is limited to move upward and downward only. Extra work is needed to enable the medication dispenser to find and alert the elderly to take the medicine on time.*

Originality/value - *The proposed cloud-controlled low-cost medication dispenser with moving capability is a promising solution to dispense medicine on time for the elderly. The user programs the medication dispenser through the app. The total cost of the prototype is only USD 50 and the price will be much lower when it is mass produced.*

Keywords : Medication dispenser, Arduino, low-cost

Implementation of Automatic Micro-Expression Recognition for Real-Time Systems

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Abstract

Background - *The trend of real-time micro-expression recognition system has increased with recent advancement in human-computer interaction (HCI) in security and healthcare. From the existing research, several studies focus on accuracy improvement, while very few studies look into addressing the computation cost.*

Purpose - *This paper puts forward an analysis of two most popular feature computation techniques for real-time automatic micro-expression recognition.*

Design/methodology/approach - *Firstly, a motion-based feature extraction technique, which is a well-known method in the field of micro-expression recognition research, is used to describe subtle changes from an image. This method estimates motion from image sequence and present as features, and is reported to have an impressive performance accuracy. However, the computational cost of existing motion-based feature extraction methods poses challenges for real-time recognition. Then, secondly, a geometric-based feature extraction technique, a very popular method for normal facial expression recognition in real-time. This is because the computational time is significantly low in comparison with motion-based. However, is reported that the existing geometric-based methods could not detect hidden changes in facial components due to its subtleness and brief. In this paper, Bi-Weighted Oriented Optical Flow (BI-WOOF) is used as motion-based feature, while a Full-face graph using facial landmarks is used as the geometric-based features.*

Findings - *The implemented systems were evaluated using the publicly available spontaneous micro-expressions databases (i.e., SMIC, CASME, CAS (ME) ^2 and SAMM). Results suggest that the Bi-WOOF yield accuracy of 68.5%, while the Full-face graph yields 74.33%. On the other hand, Bi-WOOF processes sample at 0.36 seconds and Full-face graph processes sample at 0.10 seconds with 170×140 image size. All experiments were performance on Intel i5-3470 machine.*

Research limitations - *Despite the accuracy and computational cost improvement of Full-face graph, further improvement is require for reliable performance in real-time, depending on the type of application.*

Originality/value - *The Full-face graph is an improved facial graph method presented in this paper that target to maximize the facial features, which is the general requirement for geometric-based analysis. These methods were considered based on their performances in terms of accuracy (Bi-WOOF) and low computational cost (Full-face graph). The methods are analyzed strictly for implementation and optimization for real-time application.*

Keywords : facial feature extraction, real-time classification, micro-expression recognition

5G Dynamic Spectrum Management for Vehicle-To-Vehicle Communication

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Abstract

Background - *Due to the increased demand for wireless technology and the rising amount of registered vehicles in the world, the current existing fixed spectrum allocation may not be able to support the vehicle-to-vehicle (V2V) communication services. Hence, a new dynamic spectrum management is demanded in V2V communication supporting the 5G network coexists with the existing long tern evaluation (LTE) network.*

Purpose - *This main objective of this paper is to investigate the dynamic spectrum management in V2V communication by selecting an appropriate frequency band between the distance of the vehicles, and then identify the effect of interference in the dynamic spectrum by observing the path loss, signal interference noise ratio (SINR), and the throughput with various numbers of interfering users.*

Design/methodology/approach - *A simulation is performed by using MATLAB R2020a to verify that the proposed dynamic spectrum can guarantee a better improvement from the existing fixed spectrum allocation. There are 4 steps of implementation, which are dynamic spectrum management using licensed and unlicensed band, network communication model, channel model setup and finally design of the dynamic spectrum algorithm.*

Findings - *The results show that the performance of the proposed dynamic spectrum management has significant improvement in the overall throughput of 67% and the SINR value is reduced up to 60% compared to the fixed spectrum allocation. Results in this research paper show that the SINR of the proposed dynamic system is reduced up to 60% compared to the fixed unlicensed spectrum allocation.*

Research limitations - *The radio spectrum frequency turns out to be entirely an issue because of the expanding number of cell phones and various types of wireless communication services. The current designated fixed spectrum assigned by the government may not be able to support the demand for wireless technologies. The existing scheme of dedicated short-range communication (DSRC), Cellular V2X (C-V2X) and LTE-V2X are not efficient.*

Originality/value - *The performance of the dynamic spectrum sharing scheme specially designed by making the 5G network coexist with the existing LTE vehicular communications network. The novel method able to support a LTE network to ensure a better coverage and sufficient enough for the data to be transmitted among the vehicles.*

Keywords : Vehicle-to-vehicle (V2V), dynamic spectrum, 5G, throughput, interference.

Driving Menace: A TRIZ-Adopted Solution for the Posterior Pelvic Tilt Issue

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Abstract

Background - *Studies have attributed driving-induced low back pain (DLBP) with causes like whole-body vibrations, upright postures and long driving hours. However, due to other causes from daily-living activities, the actual causes and solutions to DLBP remain nebulous.*

Purpose - *Using the theory of inventive problem-solving (TRIZ), this research aims to postulate causes and recommend solutions for DLBP.*

Design/methodology/approach - *A cause-and-effect-chain analysis (CECA) was performed. The causes within the CECA were based on comments by 19 anonymous ergonomics experts from the Human Factors and Ergonomics Society Malaysia. The causes were extended into engineering contradictions linked with TRIZ system parameters. Inventive principles were extracted by intersecting these parameters within the TRIZ contradiction matrix. With reference to these principles, some solutions were proposed.*

Findings - *The CECA unearthed posture- and design-related causes for DLBP. The posture-related cause alluded that drivers may have sat with the position of his/her hips being lower than the knees. The design-related cause suggested that the absence of lumbar support adjustment controls for the car seat might have led to the posture-related cause. Both causes in the CECA can lead to an excessive posterior pelvic tilt which results in low back pain. These causes were extended to engineering contradictions. The preliminary action principle was recommended in resolving the design-related cause through the inclusion of lumbar support adjustment controls. The inert atmosphere principle was proposed in resolving the posture-related cause through the incorporation of "voids" as an intermediary between the lumbar and seat. An example of adding "voids" includes the use of inflatable bubble wraps to elevate the driver's hip position.*

Research limitations - *Due to time constraint, it was not possible to obtain more data (surveys, interviews) for further triangulation. Budgetary constraints also limited the researchers in prototyping, experimenting and verifying the postulation and solutions.*

Originality/value - *While several solutions have been proposed to alleviate DLBP, there has yet to be a research that incorporates TRIZ to algorithmically resolve this problem. This study uncovers TRIZ-stimulated insights on ergonomic solutions to DLBP that are potentially more cost-effective than design overhauls or medical interventions.*

Keywords : TRIZ, low back pain, posterior pelvic tilt, driving, ergonomics

Track: Optics

Glare Rating Assessment on an Optimized Stadium LED Lighting Architectural Design

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Abstract

Background - *Glare is the visual sensation produced by bright or excessive light sources which could be causing discomfort, fatigue, or mistake during any football matches especially by the players on a football field. LED is a new light source that is used in stadium lighting applications. LED light source is known for having better efficacy compared to the conventional light sources that been used in stadium lighting applications. The best stadium lighting design should provide sufficient illuminance and uniformity, and also should have a minimum glare environment. However, the light performance of LED is yet to be investigated. Hence, motivated by this advantage, a study on LED lighting for stadium lighting applications has been carried out by simulation using MATLAB.*

Purpose - *In this study, glare rating (GR) was evaluated for stadium lighting that using LED as a source of lighting. The GR evaluation results will determine the visual comfort of the stadium lighting applications and determine the practicality usage of LED as a light source for a stadium.*

Design/methodology/approach - *In sports lighting applications, the generally accepted method to define glare is by using the glare rating (GR) method. The GR can be calculated based on the illuminance data for that particular stadium lighting design. Initially, three different design topologies (which using luminaire with view angle 30º, 60º and 120º) were evaluated to investigate the light output in terms of horizontal illuminance and uniformity. From the initial design topology evaluated, it was found none of them able to produce the required horizontal illuminance and uniformity. Then, another design topology was implemented by combining the best output (luminaire with view angle 30º and 60º tilted at 30º and 45º) derived from all the initial design topologies. Then the optimized design topology output was evaluated and found to significantly improve the horizontal illuminance and uniformity. By using the same four design topologies, GR was evaluated in this study to investigate the glaring exposure. GR was calculated at six different observer locations that were determined based on locations that were frequently occupied by players during football matches.*

Findings - *A good stadium lighting should have GR below 50. It is applicable up to the international match level which is the highest lighting class in FIFA specifications. Six observer positions which facing four different directions were sampled out to evaluate the glaring exposure. The result for all design topologies was varying but found below the maximum rating (50). Hence, the optimized stadium lighting design topology were found able to meet the GR requirement as well as the horizontal illuminance and uniformity requirements.*

Research limitations - *The GR varies depending on the illuminance experience by the observer under evaluation as well as the geometric parameters. In this study, the GR was calculated based on the four different design topologies.*

Originality/value - *The optimized design topology using an LED light source has significantly improved the horizontal illuminance and uniformity with less quantity of luminaires compared to the conventional lighting and hence consumed less energy. The design also able to meet the glare rating requirements.*

Keywords : Stadium lighting, light emitting diode (LED), glare rating (GR)

Track: Automation

A Comparative Analysis of Performances Between Simulated Annealing and Genetic Algorithm

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Abstract

Background - *Modelling and solving real time problems using sets of simultaneous equations with unknown variables in conventional methods, such as substitution or elimination at larger scale are time consuming. In such case, the Simulated Annealing (SA), a random search technique as meta-heuristic for global optimization problems can perform better to solve sets of equations at larger scale faster. Therefore, this study applies the SA to solve the problem of linear equations and evaluates its performances against Genetic Algorithm (GAs), a population-based search meta-heuristic, which are widely used in travelling salesman problems, noise reduction and many more.*

Purpose - *This paper presents comparison between performances of the SA and GA for solving real time scientific problems.*

Design/methodology/approach - *To solve the certain realtime systems, a set of simultaneous linear equations containing different unknown variable samples were simulated in Matlab using two algorithms-SA and GA. In all of the experiments, the generated random initial solution sets and the random population of solution sets were used in the SA and GA respectively. The comparison and performances of the SA and GA were evaluated for the optimization to take place for providing sets of solutions on certain systems.*

Findings - *The SA algorithm is superior to GA in the basis of experimentation on the sets of simultaneous equations, with a lower fitness function evaluation count in Matlab simulation. As a result, the SA algorithm performs better compared to GA in terms of the computational complexity. The simulated results and methodology etc. will be presented in the full paper.*

Research limitations - *Since, complex non-linear systems of equations have not been the primary focus of this research, in future, performances of SA and GA using such equations will be addressed.*

Originality/value - *Even though GA maintained a relatively lower number of average generations than SA, SA still managed to outperform GA with a reasonably lower fitness function evaluation count, and thereby proved to be far more computationally efficient than GA. Although SA sometimes converges slowly, still it can be used efficiently for solving optimization problems or simultaneous equations in this case. In terms of computational complexity, SA was far more superior to GAs.*

Keywords : Simulated Annealing, Genetic Algorithms, Matlab

Serious Conflict Due Lane Change at Unsignalized T-Junctions on Malaysia Rural Roadways

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[1]UTHM, [2]Multimedia University, [3]Nagoya Institute of Technology, [4]Universiti Kebangsaan Malaysia

Abstract

Background - *Road accidents are regarded as a significant cause of both human and financial damage in countries at all stages of development. In Malaysia, 548,598 accidents occurred in a single year, 2018. This resulted in a daily average of 16 people killed due to traffic accidents.*

Purpose - *This paper concentrates on the serious conflict analysis and gap acceptance of right-turning vehicles (RTVs) at three-leg unsignalized intersections on Malaysia Rural Roadways.*

Design/methodology/approach - *The selected intersections were located in Road Sections (RS) 2, 9, and 10. Two categories of serious conflict have been identified namely lane change due angular conflict and lane change due nose to tail conflict. In addition, analysis of right turning vehicle involved in lane change conflicts have been examine. The analysis of serious conflict models for RTVs were developed using binary logistic regression. Concerning the analysis of gap acceptances, we used five gap patterns to consider all the possible gap patterns for RTVs from minor to major roads at unsignalized T-junctions. Gap pattern analysis have been carried out for each types of gap and found that gap pattern three was a vulnerable gap pattern.*

Findings - *Furthermore, this research reveals that attributes Gap 3 pattern, motorcycle, speed limit more than 50 kph and RTVs were motorcycle stop near passenger car in minor road encourages serious conflict.*

Research limitations - *The research needs to examine each measure carefully and carry out further gap analysis studies at other road sections to ascertain the most suitable measures for implementation.*

Originality/value - *This study proposes to utilize average Gap 3 pattern as a novel approach to identifying and improvised the hazardous unsignalized T-Junctions.*

Keywords : Conflict analysis, gap acceptance behavior and gap pattern analysis.

Track: Micro Electronics

Low Power, Less Occupying Area and Improved Speed of a 4 Bit Router/Re-Router Circuit for LDPC Decoders

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Abstract

Background - *LDPC codes have been more error resistant as compared to other forward error-correcting codes. The proposed circuit has been proved by its performance in the presence of noise in the channel.*

Purpose - *Hence LDPC decoders have been used more actively for communication applications. In this research, the design of the multiplexer and demultiplexer is achieved using pass transistor logic.*

Design/methodology/approach - *The target will be low power dissipation, improved throughput and smaller delay with a minimum area. Low power design is essential when this circuitry is used along with many other components for communication purposes. One of the important connecting circuits in a decoder architecture is multiplexers (MUX) and demultiplexers (DEMUX). The design of the MUX and DEMUX contributes significantly to the performance of the decoder. The aim of this paper is the design of a 4x1MUX to route the data bits received from the bit update blocks to the parallel adder circuits and a 1x4 DEMUX to receive the input bits from the parallel adder and distribute the particular output to the bit update blocks in a layered architecture Low-Density Parity Check (LDPC) decoder.*

Findings - *The design uses pass transistor logic and achieves the reduction of transistors used. The proposed circuit design using a mentor graphics CAD tool uses a 180nm technology. The parameters of power dissipation, area, and delay are considered crucial parameters for a low power decoder.*

Research limitations - *This design could not be design a higher order design due to skew problem*

Originality/value - *The circuits are simulated using computer-aided design (CAD) tools, and the results depict a significantly low power dissipation of 7.06nW and 5.16nW for the multiplexer and demultiplexer, respectively. The delay was found to be 100.5ns (MUX) and 80ns (DEMUX). This decoder's potential use may be in low-power communication circuits such as handheld devices, Internet of things (IoT) circuits.*

Keywords : LDPC decoder, Multiplexer, Demultiplexer, pass transistor logic

Track: Industry 4.0

Development of an Algorithm on Smart Agriculture Monitoring System for Internet of Things (IoT) Applications

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Abstract

Background - *Researchers faced some limitations to develop algorithms for sensor-based agriculture monitoring systems working on detection or counting of fruits utilizing either conventional Color Transformations followed by the Circular Hough Transformation (CHT) or Machine Learning methods for implementing these algorithms. To overcome these limitations, this research aims to propose (IoT) based smart agriculture monitoring system with multiple algorithms such as Detection, Quantification, Ripeness Checking, and Detection of Infected vegetables.*

Purpose - *This paper presents a smart agriculture monitoring systems for an Internet of Things (IoT) applications.*

Design/methodology/approach - *The CHT has been used for detection and quantification of vegetables. Using thresholding and segmentation techniques, vegetables with defects have also been identified. A machine learning method-Convolutional Neural Network (CNN) has been used for the development and implementation of all algorithms. A comparison between traditional methods and CNN has been simulated in Matlab to find out the optimal method for its implementation in this agricultural monitoring system.*

Findings - *Compared to the traditional methods, the CNN is the optimal method in this research work which performed on all developed algorithms with an accuracy more than 90%. As an example (Case study), a tomato field in Chittagong, Bangladesh was chosen where a camera mounted mobile robot captured images from the agriculture field for which the proposed IoT based smart monitoring system was developed. This system will benefit farmers through the digitized monitored output at agriculture field in Bangladesh as well as in Malaysia. The simulation results of the proposed developed algorithm, comparison results, block diagram and methodology etc. will be presented in the full paper.*

Research limitations - *Since this proposed smart IoT based system is still driven by bulky, costly and limited powered sensors, in future work, this research aims to design a Hybrid Energy Harvester (HEH) based on an ultra-low power electronics circuits to generate the required power of sensors.*

Originality/value - *Implementation of multiple algorithms using CNN, CHT, Color thresholding and color segmentation methods for detection, quantification, ripeness checking and detection of infected crops.*

Keywords : Agriculture Monitoring system, CNN, CHT, Color thresholding, Color segmentation

Pancreatic Cancer Grading in Pathology Images

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Abstract

Background - *Pancreatic cancer is one of the deadliest forms of cancer. The grades of pancreatic cancer (Normal, Grade I, Grade II and Grade III) defines how aggressive the cancer will spread and give indication for doctors to make proper prognosis and treatment for the patient. The current method of pancreatic cancer grading, by means of manual examination of the cancerous tissue following biopsy, is time consuming and often misdiagnosed for wrong treatment.*

Purpose - *This paper present automated grading of pancreatic cancer from pathology images comparing several deep learning models on two different tissue stains.*

Design/methodology/approach - *The dataset used to train the deep learning models consists of 138 high-resolution images of pancreatic tissue samples stained with purple or blue solution. The images were sliced into smaller patches to virtually create bigger dataset. Three new datasets (Purple, Blue and Mixed) with 80% samples for training and 20% for validation were produced to study the prediction performance of single and mixed coloured stain samples. Transfer learning technique was adopted by testing on 14 different ImageNet pre-trained models (Xception, VGG16, VGG19, ResNet50V2, ResNet101V2, ResNet152V2, InceptionV3, InceptionResNetV2, MobileNetV2, DenseNet121, DenseNet169, DenseNet201, NASNetMobile and NASNetLarge) available in the Keras Application Module and these models were fine-tuned to train with our dataset. 5-fold cross-validation were employed to test all samples in the dataset and the result is averaged.*

Findings - *From the experiment, DenseNet201 (the deepest network among the 3 DenseNet models tested) appears to be the best at classifying the validation set with F1-score of 87.86% for Blue dataset, 95.61% for Purple dataset and 89.15% for Mixed dataset. DenseNet169 and DenseNet121 respectively ranked second and third. The overall result shows that the F1-score for Purple dataset is the highest while Blue dataset is the lowest. The high accuracy for all three datasets demonstrates the efficacy of DenseNet in grading pancreatic cancer despite the small training sample set.*

Research limitations - *The main limitation of this research is the limited variation and number of image samples which was partly solved by image slicing and augmentation.*

Originality/value - *This research is unique because it can assist pathologists in facilitating automated pancreatic cancer grading using deep learning model based on pathology images. To the best of our knowledge, this is the first work in grading pancreatic cancer on pathology images. Previous works either focusing only on detection (benign or malignant), or on radiology images (CT, MRI etc.).*

Keywords : pathology image, pancreatic cancer, cancer grading, deep learning, image classification

Road Congestion Analysis in Video Stream

Ahmed Ali Mahjoub Mohammed[1], Timothy Tzen Vun Yap[2], Hu Ng[3]

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Abstract

Background - *Traffic congestion in major cities continues to increase and video analytics can be used as part of a solution in keeping traffic congestion under control. An emerging technology in video analytics called YOLOv4 (You Only Look Once) allows for fast object detection and is suitable for this task. In this paper, we present our work in implementing YOLOv4 for traffic congestion analysis.*

Purpose - *Road congestion is assessed in video streams by determining the total number of vehicles as well as their speed. The video analytics is capable of classifying the congestion level, which could be low, medium, or high. This data can help with many real-time traffic management applications such as smart traffic light systems and drivers can use it to avoid certain roads during rush hours.*

Design/methodology/approach - *YOLOV4 is used with DeepSORT to assess the severity of congestion in video streams. The parameters used in this paper to assess a traffic congestion is the number of vehicles on the road and their ability to move freely. To utilise these parameters, a pre-trained object detection module is used to count the number of vehicles on a road while object tracking is used to determine whether the detected vehicles are moving or otherwise.*

Findings - *Three road scenarios are used in testing the road congestion analysis system in this work. The first scenario tested is when congestions are not detected, the second scenario is half congestion and the third scenario is fully congested road. The system accuracy is 66.67% in its prediction and the error percentage is 33.33%.*

Research limitations - *The system cannot differentiate between lanes and requires high framerates to check the movement of the vehicles.*

Originality/value - *YOLOV4 is the 4th generation of YOLO that was released last year. Our work applies this latest version of YOLO to perform traffic congestion analysis in a video stream.*

Keywords : YOLO: You Only Look Once, DeepSORT: Deep Simple Online Real-time Tracker

Driving Style Profiling using Machine Learning

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[1,2,3,4]Multimedia University

Abstract

Background - *This paper intends to develop a driver profiling system where a smartphone's built-in sensors are used alongside machine learning algorithms to classify different driving behaviours. The lack of real-time monitoring has been causing drivers to be unaware of their dangerous driving behaviour and this research paper aims to negate that.*

Purpose - *The purpose of the research is to determine the optimal combination of smartphone sensors to collect driving data and to develop a streamlined mobile application to gather different driving styles. The development of an accurate machine learning algorithm to identify different driving events is also a motivation of this research. Machine learning algorithms are capable of very fast computations and can make real-time predictions that could prove to be a crucial element of this research.*

Design/methodology/approach - *The project is divided into two parts; the first part is gathering raw data and training a machine learning model to accurately classify basic vehicular movements while the second part of the research is exporting the machine learning model onto a smartphone for real-time driver behaviour analysis.*

Findings - *The raw data gathered from the gyroscope and accelerometer sensors of the smartphone is recorded in time-series form where each of the different vehicular driving patterns can be distinguished easily. The accuracy of the machine learning model in determining the driving profile is 95.83%.*

Research limitations - *Each driving event that was carried out might not be exactly the same, as it is difficult to perform the exact movements using a vehicle while maintaining a certain speed. This could cause some inaccuracy in gathered data.*

Originality/value - *There are already a few papers that have explored the topic of using smartphones for driver profiling where a majority apply the technique of machine learning. Our research will also use machine learning with an addition of a calibration feature that will predict driver behaviour accurately even though the smartphone is not set up properly.*

Keywords : Machine learning, driver profiling, smartphone

An Accurate Lane Markings Detection Approach Executing Encode-Decode Instant Segmentation Network (EDIS-Net) with Differential Losses

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Abstract

Background - *Many innocent people suffer from disabilities and sudden death due to unwanted accidents on the roads, riveting lots of financial assets. Hence, researchers incorporate many significant features of Advanced Driver Assistance Systems. Lane marking detection (LMD) is one of the most preliminary ADAS features, which allows the vehicle to maintain the perspective road lane itself.*

Purpose - *The present research using Deep Learning (DL) techniques has some research limitations from different perspective challenges. The researchers are most commonly facing difficulties in LMD due to the environmental effects such as the variant of lights, obstacles, shadow, and curve lanes.*

Design/methodology/approach - *Therefore, this research proposed a DL technique named Encode-Decode Instant Segmentation Network (EDIS-Net) to detect lane markings under different environmental conditions with high-performance results. The framework is based on the E-Net architecture incorporating a combination of discriminative and cross-entropy losses. The encoded section was split into binary and instant segmentation to extract information about the lane pixels and pixel position. Densely-Based Spatial Clustering of Application with Noise is used to interface the predicted lane pixels to have the final output. The framework was trained on the Tusimple dataset with data augmentation and tested on three datasets, like Tusimple, CalTech, and a local dataset.*

Findings - *The model has achieved 97.39% accuracy on the Tusimple dataset. Besides, it has obtained 97.07% and 96.23% average accuracy on CalTech and the local dataset. All the experimental results are also compared with existing LMD techniques on testing datasets, where the EDIS-Net showed promising results. As the proposed framework has higher performance results on the testing datasets, it can be concluded that the framework can detect lane markings efficiently under distinct scenarios.*

Research limitations - *The proposed method has gained a slightly lower performance result in precision, FPS, and recall than the other existing research. Again, it shows a slightly lower accuracy in detecting lane markings on missing lanes, dark light, and rainy image frames.*

Originality/value - *The proposed method has gained a slightly lower performance result in precision, FPS, and recall than the other existing research. Again, it shows a slightly lower accuracy in detecting lane markings on missing lanes, dark light, and rainy image frames.*

Keywords : Lane markings detection, instant segmentation, deep learning, Differential Losses

A Health Status Classification Model for Enabling Home Hospitalization

Abubaker Sherif[1], Wooi-Haw Tan[2], Chee-Pun Ooi[3], Yi-Fei Tan[4]

[1,2,3,4]Multimedia University

Abstract

Background - *Home hospitalization and patients monitoring have attracted huge attention from researchers recently, especially with the need to observe the health condition of thousands of people outside hospitals amid the ongoing pandemic. Hence, there is a need for an automated classifier that can help medical professionals in monitoring the status of their patients.*

Purpose - *The main goal of this research is to provide a health status classification model that provides a numerical indicator of the overall health condition of the patient by feeding it with four major vital signs which are body temperature, blood pressure, respiratory rate and heart rate.*

Design/methodology/approach - *After finding a suitable dataset which was derived from hospital records, the readings for four major vital signs were extracted from each patient. The prepared dataset provides a label that associates each patient's reading with medical diagnoses. Based on the readings and diagnoses, a method was proposed to classify the health status of the patient as Normal, Low Risk or High Risk, to assist healthcare workers in identifying the patient's health condition. Since having more medical diagnoses implies more serious health condition, the decision is made based on how many diagnoses are predicted, with three or fewer diagnoses indicate low risk and more than that indicate higher risk. Model evaluation was performed using accuracy, precision, recall and F1-score.*

Findings - *By training the classification model using the prepared dataset, it was able to predict how serious is the patient's condition. This prediction was made by classifying four major vital signs. Our testing and validation procedure showed promising results with accuracy of 78% in quantifying the level of seriousness of the patient. The main contribution of this paper is a trained classification model that predict the patient's health condition based on four vital signs.*

Research limitations - *The proposed prediction model relies on four specific vital signs. Nonetheless, the model can be further improved by considering more inputs such as medical history.*

Originality/value - *The results obtained from this research can assist doctors by providing a secondary advice regarding a patient's health status when the patient is positioned remotely from the hospital.*

Keywords : Healthcare, Machine Learning, Home Hospitalization

People Counter and Social Distancing Detection System using Intel Up Squared Board

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Abstract

Background - *In view of Covid-19 pandemic, shopping retails must limit the number of visitors to enforce social distancing regulations. Currently in Malaysia, retail workers are used to count the number of people manually and constant announcements were made to remind visitors about social distancing.*

Purpose - *In this project, a real-time system has been developed to automatically count number of people in a restricted area and to detect social distancing. The proposed system should be able to run on a single-board computer (SBC) to reduce the cost of implementation.*

Design/methodology/approach - *The people counter system was designed using an Intel UP Squared board and a USB webcam. Convolutional Neural Network (CNN) is used to detect people from video stream and computer vision method is used to measure the distance between two people. Two different programs (System 1 and System 2) were evaluated to identify the best program to run on SBC. System 1 utilises CNN from OpenCV library while System 2 utilises CNN from OpenVINO library. Two pre-trained models (COCO and Intel person-retail-model-0013 datasets) were used for training, whilst four recorded and two real-time videos were used for testing.*

Findings - *The proposed systems are able to automatically count number of people and measure social distancing. An alert will be sent out if the maximum occupancy has been reached. Both systems were tested on the Intel UP Squared board but only System 2 able to run smoothly. This is because System 1 has higher inference time with an average of 3352.5 ms whereas System 2 has an average of 163.4 ms. System 2 is faster because it implements single shot detector (SSD) and has better pre-trained model for human detection. However, System 2 has a slightly lower average accuracy (73.26%) over the System 1 (84.70%). Overall, System 2 is more suitable for SBC implementation and for real-time applications.*

Research limitations - *The accuracy of proposed system can be improved further by utilising better pre-trained model for human detection in crowded places.*

Originality/value - *Most exiting solutions utilises high-end hardware and software. The proposed system able to run on SBC, which is suitable to replace the manual counting system at a lower cost.*

Keywords : People Counter System, Social Distancing Detection, Machine Intelligence

An Optimized Deep Learning-Based Framework for Pinpointing Energy Theft and Meter Irregularities

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Abstract

Background - *Non-technical losses (NTLs), including energy theft and metering irregularities, have been recognized as a daunting problem for utility providers (UPs). The $96 billion NTLs per year worldwide not only result in costly government subsidies and higher prices for consumers but also a public safety crisis. With the implementation of Advanced Metering Infrastructure (AMI), real-time data from smart meters can be leveraged to pinpoint the locations of NTLs.*

Purpose - *This project aims to develop an optimized deep learning-based framework to overcome the identified deficiencies for the mutual benefit of paying consumers and UPs.*

Design/methodology/approach - *This project endeavors to investigate physical and cyberspace theft methods to analyze spatio-temporal features closely related to the real-world NTL scenarios. Then, a framework using a modified VGG-16 network is developed to pinpoint the localities of NTLs to a good level of precision. Finally, the acceptability of the proposed framework over state-of-the-art approaches is demonstrated on the real energy consumption of smart meters. The consumption data are categorized into training (60%), testing (20%) and validation (20%). The validation data is hidden throughout training and testing and is only used to evaluate the final network.*

Findings - *The best detection rate (DR) and false positive rate (FPR) in the existing literature are 99% and 2.4%, respectively. Our proposed framework beat these scores with a DR of 99.63% and FPR of 1.95%. Although our network uses the same block styling found in VGG-16, it is improved by using 3D convolutional neural networks (CNNs) instead of 2D CNNs of the original VGG-16 network. The 3D CNNs exploit the periodicity found in the dataset to improve the classification performance.*

Research limitations - *The proposed framework is not able to identify the types of energy theft. Furthermore, a 2-year dataset is required to detect NTLs.*

Originality/value - *The strengths of our proposed framework over the existing works are as follows: • 3D CNNs are used to evaluate the data periodicity for better detection. • The adaptive Synthetic Sampling Approach is implemented to solve the class imbalance problem to minimize data contamination. • CNNs can perform feature extraction on the data and reduce its dimensionality, making deep learning a better choice when dealing with high-dimensional data.*

Keywords : anomaly detection, energy theft, smart grid, optimized deep learning

Optimizing Energy Consumption of a Rice Milling Plant Through Intelligent Control of the Paddy Dryer

Yar-Lee Teo[1], Sook-Chin Yip[2], Wooi-Nee Tan[3], Ming-Tao Gan[4], Zhi-Kang Oh[5], Alvin Wan-King Tan[6], Beng-Guan Koay[7], Issac Wan Philip[8]

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Abstract

Background - *Paddy drying requires high energy consumption and directly impacts grain quality. Per current practice, the dryer stopping time is determined via experience and manually checking grain moisture content (MC) at irregular intervals. Human error sometimes leads to problems associated with paddy underdrying (e.g., mold growth) and overdrying (e.g., broken rice). Through intelligent prediction of the MC, the dryer may be controlled such that its stopping time is just right. Not only does this yield a more consistent dried grain quality, it closely correlates with optimizing energy consumption.*

Purpose - *This project develops a prediction model that tracks the grain MC level throughout the drying process to control the stopping time of an industrial inclined bed dryer.*

Design/methodology/approach - *We begin by investigating the impact and correlation of different factors (e.g., temperature/humidity) on the grain MC. Based on the collected data, an MC prediction model is built using LSTM neural network, which is trained to a fair degree of accuracy. Subsequently, the network's performance is evaluated in terms of how closely it matches future MC levels and how reliably this prediction may be used to determine the dryer stopping time.*

Findings - *There exists a variety of approaches in modelling the grain MC profile for different types of industrial dryer. In recent literature, however, deep neural networks seem to outperform other approaches. Accordingly, our MC prediction model is developed as an LSTM network, especially since our collected data are mostly in the form of time series. When evaluated against the validation dataset, our model successfully predicted the MC from 2 hours to 10 hours ahead of time, with an RMSE of just 1.5 units. Consequently, the proposed dryer stopping time is more reasonable than the recorded time (e.g., to stop earlier when the grain is overdried, and vice versa).*

Research limitations - *The developed model can achieve accurate results only after sufficient sensor data (at least 8 hours) is collected.*

Originality/value - *This project provides accurate predictions which ease the human resource management of the paddy drying operation. By optimizing the drying time, it maintains the quality of the dried grain while minimizing excess energy consumption, potentially realizing significant cost savings for the rice mill.*

Keywords : time series prediction, LSTM neural network, intelligent control, optimized paddy drying

Impact on Human Emotion When Listening and Reciting Quran - A Review

Nur Asyiqin Binti Amir Hamzah[1], Nur Hasanah Binti Ali[2], Noor Ziela Binti Abd Rahman[3], Ervina Binti Mhd Noor[4], Azlan Bin Abd Aziz[5]

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Abstract

Background - *Although it is generally known that the Quran sound is as capable as a sound therapy to cure negatively affected emotional states, but there is very limited scientific evidence to prove the claim substantially.*

Purpose - *The aim of this study is to systematically review how does the brain responds to the activity of listening and reciting the Quran.*

Design/methodology/approach - *The main focus of this paper is to review emotion recognition available in the literature databases that utilized the electroencephalogram (EEG) since the most efficient way to collect brain data is using the EEG signal. We found that the effective way to cover all possible publications is by employing the Systematic Literature Review (SLR) technique.*

Findings - *When the technique was applied, we were able to eliminate 222 records from 231 records. The remaining of 9 records were used for the study purpose. After the review, we obtained favorable findings in emotion classification using Quran. Also, we observed that there is need to do similar study using a larger testing subject.*

Research limitations - *The review limited to only electronic database searches. There were three major electronic databases were used from their first date to end of our literature review duration, 30 April 2019: Institute of Electrical and Electronics Engineers (IEEE), Science Direct Database and Scopus Database.*

Originality/value - *All existing studies under review concluded that either the activity of Quran listening or reciting or both were capable to give positive impact to the mind state of a person. However, since all the study used only limited number of testing subjects, therefore finding out the effect of the performance using a larger testing subjects would contribute to a concrete prove to the current results. Thus, our study will continue to further examine the size of the testing subjects to the effect of the emotion classification.*

Keywords : EEG; Quran listening; Quran reciting; emotion.

Review of Brain Stroke Segmentation Techniques Based on Computed Tomography (CT) Images

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Abstract

Background - *Stroke is the second-leading cause of death in the world and needs immediate treatment to avoid serious long-term disability or death. Neuroimaging technique for stroke detection has been widely recognized by neuroradiologists to visualize anatomical structural images of the brain. The use of Computed Tomography (CT) scans has skyrocketed in the last few decades in the emergency department. CT scan has the ability on scanning bone, soft tissue, and blood vessels simultaneously by providing detailed information on the infarcts based on a very clear difference between white matter and gray matter. In helping neuroradiologists to achieve an accurate diagnosis, segmentation using computer-aided detection/diagnosis (CAD) has become a major contribution. It can automatically segment the region of interest (ROI) that could help neuroradiologists to locate and analyze accurately and reduce the time consumed process.*

Purpose - *In this review paper, we explored different segmentation techniques applied to CT images to tackle brain stroke problems. We highlight the advantages and disadvantages alongside the discussion of the capabilities of these segmentation techniques and its key challenges.*

Design/methodology/approach - *Systematic Literature Review (SLR) is the most efficient way to review papers in which the results are based on a qualitative level instead of a quantitative one. Systematic reviews use clear and rigorous methods to identify all relevant articles, critically evaluate, and synthesize the evidence. Thus, this rigorous process helps to reduce the tendency to make mistakes, improve reliability and valid conclusion.*

Findings - *The performance of segmentation techniques was investigated by comparing various parameters of the surveyed techniques. Based on the result, it reveals that the best segmentation performance was achieved by using Fuzzy C-Mean and Random Forest techniques. Furthermore, efficient machine learning methods can contribute to the best significant segmentation results.*

Research limitations - *The focus of the review is mainly on the segmentation technique that has been used for analyzing CT images for Ischemic stroke patients.*

Originality/value - *Based on the current study, this research can greatly give a vigorous impact on finding the best automated segmentation technique to assess brain stroke severity and assist the neuroradiologist with timely treatment. This project is expected to contribute new knowledge in the area of stroke research.*

Keywords : CT scan, brain stroke, medical imaging, computer-aided diagnosis, segmentation

The Development of Drone Based Hyperspectral Imaging System for Precision Agriculture

Yee Kit Chan[1], Voon Chet Koo[2], Chee Siong Lim[3], Yang-Lang Chang[4]

[1,2,3]Multimedia University, [4]National Taipei University of Technology

Abstract

Background - *Unlike conventional farming, precision agriculture integrates a suite of technological tools such as radar images, agriculture monitoring system, and high technology machines into farming practice. The aim is to minimize the crops production costs and maximize the production outputs all in benefiting the farmers. Today, Hyperspectral Imaging serve as one of the most advanced technology in remote sensing for precision agriculture applications as it allows improved analysis of specific compounds, molecular interactions, crop stress, and crop biophysical or biochemical characteristics. However, utilization of hyperspectral imaging in Malaysia's plantation is still not common.*

Purpose - *In this project, an experimental study on disease detection and nutrient extraction of plantation such as oil palm in Malaysia will be carried out using a drone based hyperspectral imaging system.*

Design/methodology/approach - *The major advantages of this hyperspectral imaging system are light weight (approximate 250g for sensor) and larger number of band selection (from 600nm to 1000nm) compare to conventional multispectral camera. With wider spectrum of observation, more information can be extracted via different band and classification of different condition can be performed. A customised multirotor drone has been designed and developed for longer endurance (30-40 minute per flight mission) as well as to carry the non-standard payload i.e. hyperspectral imaging system. Preliminary testing has been performed in laboratory and oil palm plantation to verify both multirotor drone and hyperspectral imaging system.*

Findings - *Preliminary testing has been performed in laboratory and oil palm plantation to verify both multirotor drone and hyperspectral imaging system. Initial results show that the hyperspectral data are suitable to be used for differentiation of the healthiness level of the oil palm plantation. In order to achieve the target of disease detection and nutrient extraction, timely ground truth data will be collected together with the field experiment using drone based hyperspectral camera. Data analysis on the obtained ground truth data will be carried out to study the correlation properties of the hyperspectral images with various oil palm plantation condition.*

Research limitations - *The major limitations of the proposed system are the high cost of the overall system as well as huge raw data collected due to large number of bands by the hyperspectral imaging. For future improvement, the specific band filter will be designed to only capture the desired band that responded to the specific condition of the plantation. Thus, the overall costing of imaging system as well as the data size will be greatly reduced.*

Originality/value - *A drone based hyperspectral imaging system has been designed and developed in Malaysia for precision agriculture. This research work will greatly enhance the current precision farming practice in Malaysia as well as benefit the agriculture community.*

Keywords : Hyperspectral imaging, precision agriculture, multirotor drone, remote sensing

Convolutional Long Short-Term Memory for Distortion Classification in Laparoscopic Videos

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Abstract

Background - *Laparoscopy is a surgery performed in the abdomen without making large incisions in the skin with the aid of a video camera resulting in laparoscopic video. The advantage of laparoscopy is high-speed recovery when patients can resume their normal activities within a week. Usually, specialists use laparoscopy to remove a damaged or diseased organ or remove a tissue sample for further testing. The laparoscopic video is prone to various distortions such as noise, smoke, uneven illumination, defocus blur, and motion blur. One of the main components in the feedback loop of video enhancement system is the distortion identification that automatically classifies the distortions affecting the videos and accordingly selects the video enhancement algorithm.*

Purpose - *This paper aims to address the laparoscopic video distortion identification problem by developing a fast and accurate multi-label distortion classification using deep learning model.*

Design/methodology/approach - *First, pre-trained ResNet50 CNN was used to extract spatial features from each video frame by transferring representation from large-scale natural images (ImageNet) to laparoscopic images. Next, LSTM was utilized to consider the temporal relation between the features extracted from the laparoscopic video frames to produce multi-label categories. A novel laparoscopic video dataset proposed in ICIP2020 challenge was used for training and evaluation of the proposed method.*

Findings - *First, pre-trained ResNet50 CNN was used to extract spatial features from each video frame by transferring representation from large-scale natural images (ImageNet) to laparoscopic images. Next, LSTM was utilized to consider the temporal relation between the features extracted from the laparoscopic video frames to produce multi-label categories. A novel laparoscopic video dataset proposed in ICIP2020 challenge was used for training and evaluation of the proposed method.*

Research limitations - *The scope of this research is to identify five categories of laparoscopic distortions. The video quality evaluation system can be improved in future work by ranking each category of distortion in terms of distortion intensity.*

Originality/value - *The existing laparoscopic video distortion classification solutions are based on non-generic and hand-crafted features. More generic distortion classification for quality monitoring tasks is needed. Current deep learning solutions based on Convolutional Neural Networks (CNNs) can address this matter, but they learn only spatial information. In this paper, it is proposed to utilize both spatial and temporal features in convolutional long short-term memory (ConvLSTM) model as a novel solution to enhance the classification.*

Keywords : Laparoscopic videos, Distortion Classification, Multi-Label Classification, Convolutional Long Short Term Memory, Spatio-temporal deep learning.

Road Marker Classification Mechanism using Slope Contour Analysis in Rainy Days

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Abstract

Background - *Research has shown that lane marker classification in clear days using contour features has higher accuracy within lower processing times than machine learning mechanisms like deep learning. However, in rainy conditions, lane markers tend to have both unclear images and non-lane images due to rainwater, distortion, or illumination from the wet road surface.*

Purpose - *This study aims to investigate how contour features are applied for classifying lane markers in rainy conditions. Five types of lane markers namely single, double, dashed, solid-dashed, and dashed-solid are classified in this paper.*

Design/methodology/approach - *A lane marker is identified from a total number of 4-points which form a shape of rectangular contour in every video frame to classify the lane. The rectangular points are chosen as lane markers are portrayed in a rectangular shape. An approximation function is applied to identify and rectify the rectangular shape when affected by the rainy weather. Another feature is the slope contour between two centroids to perform the classification between dashed-solid and solid-dashed.*

Findings - *The 4-points contour and the slope contour in the binary map are found to be robust in classifying the lane markers in rainy conditions. In preliminary results, our approach produced around 50% accuracy performance. However, with the improved approximation function, our approach is expected to have above 90% accuracy performance in rainy conditions.*

Research limitations - *Despite the proposed method reaches reliable performances, there are several limitations. Firstly, view-blocking from wipers since the camera is installed inside the car facing the windshield. Secondly, rainwater on the windshield makes it harder to capture lane markers on the road. Both situations tend to be worse in heavy rain.*

Originality/value - *Prior findings count the number of boundaries between the white and black regions of the road marker to classify the road markers. However, in rainy conditions, there will be many white contours as non-lane information causes the algorithm to produce a false result. Our proposed method finds a 4-point approximation contour shape to be identified as the lane marker contour and neglects other contours.*

Keywords : lane marker in rainy, contour, shape detection, rainy video, image processing

Encoding Retina Image to Words using Transformer for Diabetic Retinopathy Grading

Nouar AlDahoul[1], Hezerul Abdul Karim[2], Jamie Ledesma Fermin[3], Mhd Adel Momo[4], Myles Joshua Toledo Tan[5]

[1,2]Multimedia University, [3,5]University of St. La Salle, [4]Yo-Vivo Corporation

Abstract

Background - *Diabetes is considered among the top ten causes of death in adults. People with diabetes are prone to have eye disease such as diabetic retinopathy (DR) which damages the blood vessels in the retina and results in vision loss. DR grading is an essential process to help in early diagnosis and effective treatment and slow down the progression to vision impairment. Usually, the grading was done manually and based on high-resolution retina images examined and evaluated by a clinician which is time-consuming and prone to misdiagnosis.*

Purpose - *To enhance the DR grading, this paper proposes a novel solution based on state-of-the-art deep learning model known as vision transformer.*

Design/methodology/approach - *A set of patches extracted from a retina image represented and encoded as words were applied directly to multi-headed self-attention in the encoder. A public diabetic retinopathy dataset, proposed in Kaggle 2015 challenge, was used for training and evaluation of the proposed method. This challenging dataset includes highly imbalanced data with five levels of severity such as No DR, Mild, Moderate, Severe, and Proliferative DR. It has a large number of samples for negative (No DR) category and fewer samples for positive categories.*

Findings - *The experiments conducted show that the proposed vision transformer outperforms the existing solutions in terms of F1-score (49.5 %). Additionally, it was able to run with good inference speed (2 frame per second).*

Research limitations - *The proposed solution aims to grade the DR in retina images into five levels of severity. Thus, the proposed method considers reducing the false negative rate (detecting diseased people) more than reducing the false positive rate (false alarm). Future work will consider improving the performance of the solution by reducing false alarm to avoid misdiagnosing of healthy people as diseased ones.*

Originality/value - *Recently, existing automatic solutions are based on traditional image processing and machine learning techniques. Hence, there is a big gap when it comes to more generic detection and grading for diagnosing diabetic retinopathy. Various deep learning models such as convolutional neural networks (CNNs) were previously utilized for this purpose.*

Keywords : Diabetic Retinopathy, Imbalanced Data, Vision Transformer, Pre-trained Deep Learning Model, self-attention mechanism.

Flood Simulation and Control using Augmented Reality Sandbox

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[1,2]Multimedia University

Abstract

Background - *Augmented Reality Sandbox (ARSandbox) serves as the research tool in many geoscience-related studies and education. It becomes one of the leading tools to be implemented for educational purposes as the result of Augmented Reality (AR) features that it has which is projecting digital output onto the physical environment.*

Purpose - *The ARSandbox is analyzed in this paper on its capability to simulate and contain flood.*

Design/methodology/approach - *The hardware and software needed were identified and gathered to construct the ARSandbox. It is constructed by using the sandbox, special sand, projector, Kinect Camera and desktop computer. The software packages (Vrui VR Development Toolkit, Kinect 3D Video package and SARndbox) needed to run the ARSandbox are downloaded and configured. The digital projector is physically aligned with the sandbox for optimum image quality. The Kinect Camera is calibrated with respect to the projector to ensure precise AR projection.*

Findings - *The result is AR topographical map view generated on the sandbox and desktop computer. Through utilizing the features available on ARSandbox, the flood phenomenon is simulated successfully on the sandbox by shaping the sand surface to mimic the topographical map of an area with a river and floodplain. The virtual rain is generated to fill up the river until it overflowed and flooded the nearby flood plain. After analysing the impact of flood simulated, mitigation plan in the form of river basin and flood gate is implemented to reduce the impact of flood on the floodplain. River basin reduces the flow of water towards the floodplain. Flood gate contains the water from flowing to the floodplain.*

Research limitations - *The ARSandbox has a limited mapping accuracy. The main improvement to be done is updating the ARSandbox to load real world maps with Digital Elevation Model (DEM) file type.*

Originality/value - *Compared to Geographic Information System (GIS) mapping, ARSandbox is better in terms of its 3D visualisation features where it also allows users to physically interact on the surface of the flood map and much easier to interpret the results and finding of a phenomenon.*

Keywords : AR Sandbox, Flood Simulation, 3D Visualisation Tool, Real-time, 3D Experiential Learning

Using Emojis in a Shoulder-Surfing Resistant Authentication Method

Yvonne Kam[1], Mohamed Mahrous Mahrous Mohamed Amer[2]

[1,2]Multimedia University

Abstract

Background - *Images have higher memorability than purely text-based passwords. Nevertheless, graphical information is susceptible to shoulder-surfing attacks.*

Purpose - *This paper studies whether graphics such as emojis offer better memorability than numerics when implemented in a shoulder-surfing resistant authentication method. Thus, the proposed method aims to meet both needs of being shoulder-surfing resistant as well as being memorable.*

Design/methodology/approach - *The proposed system implements emojis in place of numerics in the reference method, DragPIN, and added cue questions for added security. In the method, users composed emoji-based stories using personalised cue questions that served as memory aids. Meanwhile, these self-chosen cue questions were less comprehensible to shoulder-surfing observers. There were two variants of the DragPIN method, manual and automatic-sliding. To study the differences, both the original configurations and also their counterparts using the proposed methodology were implemented. Thirty people participated in user testing. A pre- and post-survey appraised user experience. User testing for all four variants in terms of accuracy, time taken, memorability, and usability was performed.*

Findings - *The proposed authentication system was successful at resisting shoulder-surfing. The time taken for both variants (manual and automatic-sliding) using the proposed methodology was shorter than using the reference method. After 4-6 weeks, the login accuracy (including the failed authentications within three attempts) was between 86-92% for the proposed method and between 76-79% for the reference method. This could point to higher memorability in the proposed method.*

Research limitations - *Limitations-wise, since the emoji-based passwords were implemented in only one method, it is yet undiscovered whether the memorability gains will extend to other authentication methods. Also, the sample consisted of mostly young people and insufficient numbers were available to observe the effect on older adults.*

Originality/value - *The study provides real-life testing of emoji-based stories in authentication. Emojis are ubiquitous in computers and smart devices, readily used and recognized. They are light in storage, unlike images such as photographs. This can improve the speed, and requirements for storage and retrieval in authentication. This work can inform the use of emoji-based stories in forming memorable passwords. Graphical Authentication System, PIN, Password, Emoji, Shoulder-surfing Personalised cue questions can be used as a method to aid memorability while not increasing guessability significantly.*

Keywords : Graphical Authentication, PIN, Password, Emoji, Shoulder-surfing

Video-based Facial Emotion Recognition using Deep Learning Detector and Classifier

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[1,2,3]Multimedia University

Abstract

Background - *Facial expressions play an important role in human communication as it is the main non-verbal channels that assist the understanding of human internal emotions. Over the years, numerous research works have been put forward to advance the field of facial expression recognition, FER which until today, is still considered a challenging task.*

Purpose - *This paper proposed a deep learning-based facial emotion recognition pipeline that can be used to predict the emotion of detected face regions in video sequences*

Design/methodology/approach - *Five well known state-of-the-art convolutional neural network architectures are used for training the emotion classifier to identify the network architecture which gives the best speed-accuracy trade-off. Two distinct facial emotion training datasets are prepared to investigate the effect of image colour and facial alignment on the performance of facial emotion recognition.*

Findings - *Experimental results show that training the FER model with grayscale-aligned facial images is preferable as it offers better recognition rates with lower detection latency. The lightweight MobileNet_v1 is identified as the best performing model with width multiplier, WM=0.75 and resolution multiplier, RM=160 as its hyper-parameters, achieving an overall accuracy of 86.42% on the testing video dataset.*

Research limitations - *The current approach utilizes the video sequences available online to train and validate the facial emotion recognition model proposed in this work. The overall accuracy very much depends on the size of the dataset used.*

Originality/value - *These findings provide general guidance on training Facial emotion recognition to give the best recognition rates with low detection latency.*

Keywords : Facial Emotion Recognition, Deep Learning, Convolutional Neural Network, Facial Landmark, Facial Alignment.

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International Conference on Communication, Language, Education and Social Sciences

Virtual Conference
June 21-23, 2021

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CONFERENCE CHAIR MESSAGE

We are delighted to welcome you to International Conference on Communication, Language, Education and Social Sciences (CLESS 2021) by by Multimedia University (MMU), Research Synergy Foundation (RSF), and Canadian University, Dubai (CUD) that held virtually on June 21-23, 2021.

The 2nd International Conference on Communication, Language, Education and Social Sciences (CLESS 2021) will be held on 21st -23rd June 2021. This year's conference will be a part of the bigger Digital Future Congress (DIFCON) comprising of various other conferences in different fields and will be held online.

CLESS 2021 is unique in which it combines language, education, and social science in an international academic conference. The aim of CLESS 2021 is to offer a platform for both local and international academics, educators, researchers and other professionals to meet, share and discuss latest research, trends, ideas and innovation in the field of communication, language, education, psychology and social sciences. The conference is aimed to provide a platform for young researchers as well as to support and encourage other researchers to present their research, to network within the international community of researchers and to share and seek the insight and advice of successful senior researchers all over the world during the conference.

It has been our privilege to convene this conference. Our sincere thanks, to the conference organizing committee; to the Program Chairs for their wise advice and brilliant suggestion on organizing the technical program and to the Program Committee for their through and timely reviewing of the papers. Recognition should go to the Local Organizing Committee members who have all worked extremely hard for the details of important aspects of the conference programs and social activities.

We welcome you to this conference and hope that this year's conference will challenge and inspire you, and result in new knowledge, collaborations, and friendships.

Best regards,

Dr. Sareen Kaur Bhar

CLESS Conference Chair

CONFERENCE CHAIR

Dr. Sareen Kaur Bhar

Sareen Kaur Bhar has been involved in the field of training and development for the last 12 years. She helps companies and individuals build relationships and enhance success through effective communication. Sareen puts a lot of passion and energy into her presentations to make sure they are entertaining, practical and informative, as well as a lot of fun. With her friendly, down-to-earth style, she has a unique way of engaging with the audience, and is passionate about helping people commit to change. Participants in her training sessions are quick to see and share her passion and enthusiasm, and are motivated to use her strategies back at the workplace. She is regularly engaged as a corporate trainer in soft skills development especially in the area of communication. Her academic qualifications are Cert. Education (TESL), B. Ed (TESL), M.A. Linguistics. She is currently pursuing her PhD examining language use and choice in organisations.

KEYNOTE SPEAKER

Dato' Wei Chuan Beng

Dato' Wei Chuan Beng is an active industry captain and recognized entrepreneur in telecommunication and the digital /ICT industry with an illustrious career developing the nations digital/ICT industry and actively contributing to various national initiatives.

Dato' Wei is currently the Council Member of National Digital Economy and Fourth Industrial Revolution (IR 4.0), which is chaired by the Prime Minister of Malaysia. The council serves as a delivery-driven governance structure to implement the blueprint, MyDIGITAL to portal Malaysia towards a bright digital future.

Dato' Wei joins as a Senior Executive Director of KSI Strategic Institute (KSI) since July 2020. KSI is an institute that provide strategic advice, high level executive briefings, international conferences, policy roundtables and national summits. Dato' Wei is also a Non-Executive Director on the board of Red One Holdings Sdn Bhd (redONE). redONE is the most successful Mobile Virtual Network Operator (MVNO) in Malaysia and is currently expanding to ASEAN countries. Dato' Wei is currently the Champion of Digital Productivity Nexus under the auspices of Malaysia Productivity Cooperation (MPC). Dato' Wei was appointed as a Commission Member of the Malaysian Communications and Multimedia Commission (MCMC) from 1 October 2018 for a period of 2 years. Dato' Wei's entrepreneurial journey has been illustrious. He co-founded REDtone Telecommunications Sdn Bhd in 1996. REDtone was a founding MSC status company, that has been known to do R&D in the digital/ICT industry. He successfully listed his company in 2004 and exited in 2015. He has been active in angel investing since then. Dato' Wei has also contributed immensely to the nations' higher education. He was formerly a private sector advisory committee member to the Ministry of Higher Education. He has been serving the role of CEO faculty member and adjunct professor of UTM and UTHM. He is a trustee for the UTM Endowment Fund and a board member for UTMSPACE.

He obtained his Bachelor's Degree (Honors) in Electrical Engineering from University Technology Malaysia in 1989 and Diploma in Management (Bank Negara Gold Medalist Award Winner) from Malaysia Institute of Management (MIM) in 1995. He also completed an Entrepreneur Development Program from the renowned MIT Sloan School of Management in USA in 2006

Dato' Wei Chuan Beng can be reached at: wei@digitalway.net

KEYNOTE SPEAKER

Associate Professor Dr. Moniza Waheed

Moniza Waheed was born on the 21st of October 1982 in Kota Kinabalu, Sabah, Malaysia. She obtained her Ph.D. in Political Communication from the University of Amsterdam in 2013. She graduated from Western Illinois University with a M. A. in Communication in 2008 and from Universiti Putra Malaysia (UPM) with a Bachelor's degree in Communication in 2004. Moniza is currently an Associate Professor in Communication at UPM. Since 2013, she has served as a principal and co-researcher to several local and international research grants amounting to more than RM 400,000. She has authored and co-authored a total of 34 publications. Besides publishing, Moniza has also served as a reviewer to several renowned journals such as Political Communication, the International Journal of Press Politics, and the International Journal of Public Opinion Research. She also reviews submissions to international conferences such as the International Communication Association conference and the World Communication Association Biennial conference. Over the years, Moniza has presented more than 30 academic papers based on her research ideas and findings at conferences around the world. Her involvement in academia has won her 17 local and international awards, with the most recent being UPM's Vice Chancellor's Fellowship Teaching Award: Junior Category in the Social Sciences and Humanities for the year 2020. She is an active member of the Fulbright Alumni Association of Malaysia where she holds the position of Honorary Secretary. At present, Moniza is attached to the Ministry of Higher Education Malaysia.

Moniza can be reached at: moniza@upm.edu.my

SESSION CHAIRS

Ms. Elaine Ang Hwee Chin

Ms. Elaine Ang Hwee Chin is a researcher and an academician, working in the field of language and communication. With more than 21 years of teaching experience, Ms. Elaine is currently attached to the Department of English in Multimedia University, Malaysia as a lecturer. She teaches English and Business Communication Skills in the aforementioned university for more than 14 years and has published several research papers in International Journals and conference proceedings. Her research interests lie primarily in the area of English as Second Language and Education. Since 2016, she has been a certified HRDF Trainer and has conducted numerous Workplace Communication Skills trainings for unemployed graduates, non-executives staff and employees of government ministries.

Mr. Veeramuthu A/L Veerappan

Veeramuthu a/l Veerappan was born in Johor Bahru, Malaysia on the 17th February 1975. He has completed his Diploma in Management from Institute of Tun Abdul Razak in 1998, has obtained a Bachelor of Education (TESL) 2006 and Master in Applied Linguistics (English) 2010 from Universiti Putra Malaysia. His major field of study is in teaching English as a second language and applied linguistics. He has published numerous peer reviewed research papers in International Journals and conference proceedings. He started teaching career in SMK (LKTP) Tengaroh A in the year 2000. He is currently working as lecturer at Faculty of Applied Communication in Multimedia University. He has experience teaching English as Second Language for 21 years for both local and International students. He is a certified HRDF trainer and conducts trainings for SLIM, WEP TM, MITRA and PROTEGE in the area of Workplace Communication. His research interest is in ELT, ESP, EFL and ESL written discourse.

Hon. Chester Alexis C. Buama, PhD, FRIM

Hon. Chester Alexis C. Buama, PhD, FRIM is a College Professor at Laguna State Polytechnic University under the Faculty of College of Arts and Sciences and currently serving as Regent of the LSPU Board of Regents the highest policy-making body of the university. He previously served as the College Research Coordinator and Coordinator of Curriculum, Instruction Quality Assurance, A Consultant of the Department of Education Central Office for Learning Assessment and National Trainer of the Commission on Higher Education for General Education Courses. He is also a member of local and international organizations: he is a Fellow and Senior Member of the Royal Institute of Management and the Royal Institute of Educators, Singapore, Reading Association of the Philippines, and International English Learners Training Institute. He was a Philippine Youth Ambassador to ASEAN countries and Japan which was sponsored by the Cabinet Office of Japan and Office of the President of the Philippines in 2010. He has a Master's degree in Management major in Public Administration and a Bachelor's degree in Journalism. He was conferred a Doctorate Degree in Philosophy major in Public Administration in 2016 and graduated with a Doctorate Degree in Philosophy major in Business Management in 2018. At present he is teaching Human Behavior in Organization, Social Philosophy, Principles of Management and Organization, Good Governance and Social Responsibility, Business Communication, both in the undergraduate and graduate levels. Moreover, he has actively participated in the Civic Activities of the Global Cooperation Society International, Philippine National Chapter and is often invited as resource speaker in various management, research writing, journalism and leadership seminars. Recently, he was awarded the Ambassador Seal of Excellence for Education as Research Practitioner and as 2018 Outstanding Premier College Professor and Humanitarian Service Excellence Award by the Asia Pacific Excellence Council, Inc.

Dr. Karen Ang Manaig, EdD

Karen Ang-Manaig is a graduate of Doctor of Education Major in Educational Management at Laguna State Polytechnic University, Philippines. She is an Assistant Professor II and is the current Associate Dean of the College of Teacher Education at one of the campuses at the same university.

She teaches Professional Education and English courses in the undergraduate programs as well as in the graduate programs for Teacher Education courses. She was a Visiting Professor and Panel Member for Thesis Defense of Masters of Arts in English, Thai Nguyen University, Thai Nguyen City, Thai Nguyen Province, Vietnam on August 22-31, 2009.

As a prolific researcher, Professor Manaig had published her research in international refereed and Scopus-Indexed journals. These publications had garnered multiple citations in Google Scholar and other online journal repositories. Likewise, these research papers were presented in national and international conferences. She has also written several books in teacher education.

One of her research papers was adjudged as the Best Research Paper in the Natural and Applied Science Category during the Research Excellence Awards at the 3rd International Research Conference on Higher Education, organized by the Commission on Higher Education, Department of Science and Technology- NCR, Philippine Higher Education Research Consortium, Asia Pacific Consortium of Researchers and Educators Inc. (APCORE) & Polytechnic University of the Philippines (PUP) in year 2015.

At present, she is a member of the Editorial Board of the International Journal of Business and Economic Affairs and a Peer Reviewer at the International Journal on Research in STEM Education.

Dr. Alberto D. Yazon, PhD

Dr. Alberto D. Yazon is the Director for Quality Assurance at the Laguna State Polytechnic University (LSPU), Philippines and an Associate Professor in mathematics, statistics, and research method courses in the tertiary and graduate programs. After graduating from LSPU San Pablo with a Bachelor's Degree in Mathematics, Cum Laude and as a Department of Science and Technology (DOST) Scholar, he started teaching at LSPU Los Banos in 2008.

He holds a Master of Arts in Mathematics from LSPU San Pablo and a Doctor of Philosophy in Mathematics Education from Philippine Normal University – Manila. He conducted quantitative studies along motivation, self-efficacy, mathematics proficiency, work engagement, teacher and student performance, job satisfaction, assessment of learning outcomes, among others. He is an Associate Member of the National Research Council of the Philippines under the Social Science Division with one (1) patent, 51 citations, and 28 publications, five (5) of which are Scopus indexed.

Dr Dyah Nirmala Arum Janie

Dr Dyah Nirmala Arum Janie is the Director of Scientific Publication in Semarang University Indonesia since 2018 and a member of the RSF Scientific Board since 2019. She received her PhD in 2014 from Diponegoro University, Indonesia. Three words that describe her are inquisitive, philomath and polymath. Despite her challenging daily routines as a mother of four children, she has been involved in various research in accounting, e-commerce, SMEs, computer and information system, finance, and social/organizational psychology. She holds several publications, such as in the Humanities & Social Sciences Reviews, International Journal of Multidisciplinary Research, and Economics & Business Solutions Journal. She is very open to research opportunities from other fellow researchers and is currently seeking research partners globally.

CONFERENCE PROGRAM

Day 1, Monday, June 21st, 2021

Time (UTC+8)			*Dur'*	*Activity*
CLESS Room 1				https://us02web.zoom.us/j/81295287369?pwd=aytMVUhrV3A4eGY0VFZOQkZhV2U0Zz09 Meeting ID: 812 9528 7369 Password: DIFCON21
13:30	-	13:35	0:05	**MC Welcoming**
13:35	-	14:15	0:40	KEYNOTE 1: SPEAKER: Dato' Wei Chuan Beng TOPIC: Education in the New Age
14:15	-	14:20	0:05	Session Chair Introduction
14:20	-	16:20	2:00	**Presentation Session 8 person/room** 15 minutes/presenter
16:20	-	16:30	0:10	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
16:30	-			Break & Announcement to go to Main Room at 16.30

Day 2, Tuesday, June 22nd, 2021

Time (UTC+8)			*Dur'*	*Activity*
9:30	-	9:40	0:10	**MC Welcoming**
9:40	-	10:40	1:00	KEYNOTE 2: SPEAKER: Associate Professor Dr. Moniza Waheed TOPIC: Argumentation as Part of Strategic Communication
10:40	-	10:45	0:05	Session Chair Introduction
10:45	-	13:00	2:15	**Presentation Session 9 person/room** 15 minutes/presenter
13:00	-	13:10	0:10	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
13:10	-	13:40	0:30	Break
13:40	-	13:45	0:05	Session Chair Introduction
13:45	-	16:00	2:15	**Presentation Session 9 person/room** 15 minutes/presenter
16:00	-	16:10	0:10	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
16:10	-			Break & Announcement to go to Main Room at 16.30

Day 1: Monday - June 21, 2021

CLESS - Room 1

https://us02web.zoom.us/j/81295287369?pwd=aytMVUhrV3A4eGY0VFZOQkZhV2U0Zz09
Meeting ID: 812 9528 7369
Password: DIFCON21

Session 1: 14.20 - 16.20 (UTC+8)

Session Chair: Ms. Elaine Ang Hwee Chin & Dr. Chester Alexis C. Buama

Track Communication Studies

Paper ID	Presenter	Paper Title
CLE21103	Mokhtarrudin Ahmad	The Relationship Between Virtual Classroom Usage and Student's Communication Skills in Multimedia University
CLE21109	Mohammad Romadlon Afwan	Counsellor's Approach of Therapeutic Communication in Rehabilitation Program for Narcotics Addicts at the Class IIA Narcotics Penitentiary in Sungguminasa
CLE21113	Nurul Khaeriah	Barriers to Intercultural Communication of Married Couples European-Indonesian in the City of Makassar
CLE21122	Suhana Binti Mohamed Salleh	Understanding Risk Communication Dissemination During Public Health Emergencies among Orang Asli Kids in Selangor
CLE21124	Adlene Aris	Impact of COVID-19 Misinformation on Elderly Mental Health in Malaysia

Track Culture

Paper ID	Presenter	Paper Title
CLE21104	Nur Atirah Kamaruzaman	"Queer" Bodies on Instagram: Exploring Gender Nonconforming Identity from a Malaysian Muslim Perspective

Track Education

Paper ID	Presenter	Paper Title
CLE21107	Mei Lick, Cheok	Pre-University Students' Perceptions of Online Learning During COVID-19: A Case Study in Malaysia
CLE21114	Leonard Yew Chi Boon	Hands-on Learning of Chemistry Concepts

Day 2: Tuesday - June 22, 2021

CLESS - Room 1

https://us02web.zoom.us/j/87655377604?pwd=WUUwMFZwRmdKOWRWVXBWdWJpcDFnZz09
Meeting ID: 876 5537 7604
Password: DIFCON21

Session 1: 10.45 - 13.00 (UTC+8)

Session Chair: Mr. Veeramuthu A/L Veerappan & Dr. Karen Ang Manaig, EdD

Track Education

Paper ID	Presenter	Paper Title
CLE21123	Gabriela Ooi	Cultivating Environmental Counciousness Online among University Graduates
CLE21126	Aimi Hazwani Abdullah	Parents' Struggles in Providing Educational Support for Online Learning During COVID-19 Pandemic in Malaysia

Track Languages

Paper ID	Presenter	Paper Title
CLE21106	Sareen Kaur Bhar	Importance of English in Malaysian Agricultural Organisations
CLE21110	Elizabeth Marshall	Ghazal According to Kashmiri American Poet Agha Shahid Ali
CLE21111	Yong Eng Chua	A Close up of the Use of Weblogs and Blogging Buddies: A Case Study in Malaysia
CLE21116	Suhaila Abdullah	Genre Awareness among Foundation in Law Students
CLE21117	Veera Muthu Veerappan	Rhetorical Analysis of Electrical Engineering Undergraduate Laboratory Report
CLE21119	Rohaidah Mashudi	Language Etiquette: Teaching and Learning Malay Language for Foreign Students
CLE21121	Sue-Lyn Ong	Rapport Management in Intercultural Students' Group Work Interactions

Day 2: Tuesday - June 22, 2021

CLESS - Room 1

https://us02web.zoom.us/j/87655377604?pwd=WUUwMFZwRmdKOWRWVXBWdWJpcDFnZz09
Meeting ID: 876 5537 7604
Password: DIFCON21

Session 2: 13.45 – 16.00 (UTC+8)

Session Chair: Dr. Alberto D. Yazon & Dr. Dyah Nirmala Arum Janie

Track Languages

Paper ID	Presenter	Paper Title
CLE21125	Teow Boon Yan	The Relationship Between Academic Performance and Online Language Learning in Institute of Higher Education

Track Psychology

Paper ID	Presenter	Paper Title
CLE21105	Wong Siew Ping	Malaysia Undergraduate Students' Mindset of Intelligence
CLE21108	Hawa Rahmat	Pandemic-Related Stress and Resilience among Digital Workers
CLE21112	Hawa Binti Rahmat	Students' Attitude and Coping Strategies on Online Learning in Times of COVID-19 Crisis

CLE21115	Siti Rasyidah Binti Sanudin	The Influence of Extroversion and Introversion Personality Types on Virtual Learning During Pandemic COVID-19 Crisis
CLE21120	Masyitah Mahadi	The Job Applicant Reactions Towards Patterned Behavior Description Interview (PBDI) and Mixed Situational Interview and Patterned Behavior Description Interview (Mixed SI PBDI)

Track Social Science

Paper ID	Presenter	Paper Title
CLE21101	Siti Nurul Huda Mohd	Adoption Factors of Gamification in Learning among Students
CLE21102	Shadia Binti Suhaimi	Factor Influencing Behavioural Intention Towards Mobile Payment System Adoption among Malaysian Youth
CLE21118	Mohd Hairul Anuar Razak	Dimension of Digital Patriotism Towards Digital Society Development

Track: Communication Studies

The Relationship Between Virtual Classroom Usage and Student's Communication Skills in Multimedia University

Mokhtarrudin Ahmad[1], Sophiya Rose Elena Ahmad Latifi[2], Nur Iffah Miza Mohamad Fahmi[3]

[1,2,3]Multimedia University

Abstract

Background - *Virtual classrooms have become a trendy way of conducting teaching and learning, especially at higher learning institutions. During pandemic COVID-19, all higher learning institutions were forced to change their mode of teaching and learning to facilitate the smooth transition between traditional to new normal in teaching and learning. At the same time, students are facing many challenging issues including communicating with their instructors or classmates.*

Purpose - *This research conducted to investigate the virtual classroom usage patterns, level of communication skills, and the relationship between virtual classroom usage patterns to students' communication skills.*

Design/methodology/approach - *This research applies quantitative data collection methods due to this research being based on the students' attitudes, behaviors, and opinions on virtual classrooms and the impact it brings to their communication skills. A number 375 sample has been chosen and 256 responded to the survey. Questionnaire distributed via Google Form link to the selected student via WhatsApp.*

Findings - *Research indicates that a virtual classroom is considered important in teaching and learning as well as communication skills. This research concludes that using virtual classrooms had positive effects on developing students' communication skills.*

Research limitations - *This research only focuses on virtual classroom usage patterns and how they affect communication skills among Multimedia University students.*

Originality/value - *This research focusing on the student from Multimedia University and MMU have an incredible facility to facilitate the teaching and learning online. Therefore, this research contributes to the body of knowledge by selecting a different set of populations especially in Tertiary Education in Malaysia.*

Keywords : Virtual classroom, communication skills, university students, teaching and learning, tertiary education

Counsellor's Approach of Therapeutic Communication in Rehabilitation Program for Narcotics Addicts at the Class IIA Narcotics Penitentiary in Sungguminasa

MOHAMMAD ROMADLON AFWAN[1], HAFIED CANGARA[2], TUTI BAHFIARTI[3]

[1,2,3]Department of Communication, Hasanuddin University

Abstract

Background - *The communication approach has been applied in the implementation of the rehabilitation program for narcotics addicts in penitentiary. In addition to serving sentences, narcotic addicts are placed in penitentiary to serve in a training program in the form of rehabilitation using a therapeutic communication approach in which the kinship system is applied to create a replica of social relations in society*

Purpose - *The purpose of this study is to find out what forms of therapeutic communication Counsellor's methods are used during the program, what activities are carried out by inmates during the rehabilitation program, and what efforts are made to change the residents condition in order to get rid of addiction and the negative impact that results from using of narcotics*

Design/methodology/approach - *Qualitative methods with a descriptive approach are applied in this research, the informants were selected through purposive sampling. Data obtained through in-depth interviews, direct observation and documentation of activities. The data obtained were analyzed using triangulation techniques to obtain validity*

Findings - *The implementation of the rehabilitation program is carried out using the basic principles of communication which emphasizing the effectiveness of the use of communication between counsellors and residents, as also communication patterns between fellow residents to influence the other residents to eliminate the feeling of using back narcotics*

Research limitations - *The expertise of counsellors are very important to approach emotionally in order to create deeper intimate relationships. In line with this method, counsellors try to provide empathy to residents so they feel supported to be free from narcotics addiction*

Originality/value - *This program is expected to increase a sense of resident confidence, strengthening resident self-control to become resistant to narcotics, training to be a leader, and have a sense of responsibility. So residents could change their attitudes and improve their personalities to be applied in their daily lives and live within the positive norms prevailing in society*

Keywords : counsellor, therapeutic communication, narcotics rehabilitation, narcotics user

Barriers to Intercultural Communication of Married Couples European-Indonesian in The City of Makassar

Nurul Khaeriah[1], Jeanny Palinggi[2], Muhammad Farid[3]

[1,2,3]Hasanuddin University

Abstract

Background - *Mixed marriages between Indonesian women and men from Europe are a unique phenomenon found in Makassar City. Data from the Mixed Marriage Community of South Sulawesi (KPCSS) notes that marriages between Indonesian women and men from Europe in Makassar City are the second highest after mixed marriages between Indonesian women and Asian men. This is interesting, because the cultural differences between Indonesia and European countries are very large when compared to other regions. Cultural differences are also one of the triggers for the emergence of intercultural communication barriers that can lead to misunderstandings in mixed marriages.*

Purpose - *This study is to reveal the intercultural communication barriers faced by European-Indonesian married couples in Makassar City and the efforts made to overcome these obstacles so that marriages are built with differences the complex can stay in harmony.*

Design/methodology/approach - *This study uses qualitative research methods by collecting data through interviews with 10 informants who are carried out directly using the help of communication technology such as email and WhatsApp as a result of the pandemic covid-19 which limits face-to-face meetings.*

Findings - *The results of the study found four main obstacles in mixed European-Indonesian marriages, namely distance barriers that make husbands and wives live separately from the country, psychological barriers that trigger differences in perceptions, and rooted anthropological barriers from culture and become a trigger for conflict as well as semantic barriers that arise due to a lack of understanding of the language of each partner so that sometimes the meaning of the message is not conveyed properly. To overcome these obstacles, married couples try to understand each other and create a unique communication style, one of which is discussing in bath up as part of a strategy for effective communication.*

Research limitations - *This study only discusses communication barriers in general experienced by 5 intermarried European - Indonesian married Couples in Makassar City who have been married for at least two years.*

Originality/value - *This research has succeeded in uncovering communication barriers that are influenced by the cultural backgrounds of Europe and Indonesia, which until now is still limited research.*

Keywords : Communication Barriers, Intercultural Communication, Mixed Marriage, Europe, Indonesia

Understanding Risk Communication Dissemination During Public Health Emergencies Among Orang Asli Kids in Selangor

Suhana Binti Mohamed Salleh[1]

[1]Multimedia University

Abstract

Background - *Public health emergencies such as Covid-19 pandemic decease outbreak in Malaysia have seen challenges, faced by Malaysians including the Orang Asli (OA) kids in Selangor. Risk communication (RC) during public health emergencies in Malaysia, entails systematic dissemination of information to its diverse audiences, including the OA in Selangor. It seems, currently there is lacking of studies in this area especially in a multicultural country like Malaysia.*

Purpose - *The purposeof the research is to examine the understanding of RC dissemination during Covid-19 among OA kids in Selangor. It also provides insight on how dissemination of RC information strategies will help to engage with these OA kids for their better understanding of this pandemic.*

Design/methodology/approach - *The researcher will implement creative method in engaging and communicate with the OA kids in getting data. In order to this study, respondents will be given a storyboard templete and tools (i.e pencil, marker pen and colour pencils) to achieve this method. Responsdents are required to express their understanding on RC through their own concept or idea showing action, or thinking a probem through from start to finish of their storyboards to express their understanding of RC. Tweenty of OA kids age seven to ten in Kampung Orang Asli, Batu 12, Gombak are identified to participate in this study.*

Findings - *Results showed that more engagement and creative method need to be implemented in communicating RC especially with the OA kids.*

Research limitations - *However, this study might be limited, such as, in inability to acquire previous data and limitation of getting respondents of OA kids because of pandemic situation, where the movement of all Malaysians are restricted due to the current movement control order (MCO) announced by the government.*

Originality/value - *The findings contribute to the authority of those agencies related to public health emergencies works in providing more alternative methods in communicating RC among OA kids.*

Keywords : Risk communication, public health emergencies, orang asli, decease outbreak

Impact of Covid19 Misinformation on Elderly Mental Health in Malaysia

ADLENE ARIS[1], Hawa binti Rahmat[2]

[1,2]Multimedia University

Abstract

Background - *Malaysia has been facing the Covid19 pandemic for a year now and within the year, the government has been struggling with managing misinformation of Covid19 and all issue related to it. Government efforts in curbing the spread of fake news related to Covid19 have been into place such as through Sebenarnya.my website, Telegram channels administered by the National Security Council (MKN), and others.*

Purpose - *This study will focus on the impact of misinformation or the spread of fake news on the elderly group's mental health. The objectives of this study are to 1) study the types of Covid19 news the elderly are exposed to, 2) to investigate their level of understanding of misinformation, and 3) to study their responses towards misinformation.*

Design/methodology/approach - *The informants will be approached through an in-depth interview method. The informants will be selected based on the inclusive characteristics of individuals aged 65 years old and above, owns a smartphone or any other type of communication devices, and is a social media or communication platform user like Whatsapp or Telegram.*

Findings - *The researchers anticipate results that could be used as a guideline to be shared with the elderly when looking for clarification of news before believing it and spreading it to others, creating more misinformation and panic.*

Research limitations - *The limitations of the research related to the method of study. Future research can be further extended into a survey to obtain richness of data.*

Originality/value - *The paper will look into misinformation and its impact on elderly mental health in Malaysia. Previous studies focused on the elderly's response to Covid19 in general but not on the impact on their mental health especially during the strict Movement Control Order.*

Keywords : Covid19, misinformation, elderly, mental health

Track: Culture

"Queer" Bodies on Instagram: Exploring Gender Nonconforming Identity from a Malaysian Muslim Perspective

Nur Atirah Kamaruzaman[1], Malcolm James[2], Emile Devereaux[3]

[1]Multimedia University, [2,3]University Of Sussex

Abstract

Background - *This paper examines self-representation and identity formation among gender nonconforming Malaysian Muslim on Instagram. I explore the complexity of Malaysian Muslim identity, particularly Malaysian Muslim males who are featuring themselves as "queer" (used here and afterwards as a verb) on their Instagram video posts.*

Purpose - *Making use of theories and research on queer studies, Malay Muslim culture (religion), and gender identity, the paper analyses the strategies employed by gender nonconforming Malaysian Muslim males in constructing their (online) identities as well as the tensions and conflicts they experience in formulating a Malaysian Muslim identity marked by queerness.*

Design/methodology/approach - *The paper demonstrates how "queer" bodies construct and exhibit their gender nonconforming identities, in which normative Malays, religion markers, and the state affect them, by analysing representations of queer Malays in the works of "modern" Malaysian Malay scholars and thinkers, as well as interviewing queer(ed) gender nonconforming Malaysian Muslims on Instagram and their followers.*

Findings - *Gender nonconforming Malay males on Instagram adopt a range of identity markers and strategies in formulating their own cultural identity lenses which include embracing both gender nonconformity and religious beliefs. The strong ties between religion and gender nonconformity becomes a problematic conflict to "queer" Malaysian Muslims who wish to establish their queer(ed) identities, but highly prevented from doing so because of their deep-rooted Malay identity and the obligation to follow the Islamic concepts of halal and haram.*

Research limitations - *Further research is needed focusing on how other online platforms besides Instagram can serve as an alternative space for "queer" Malaysian Muslims to (re)configure their hybrid identity of being Malay, Muslims, and gender nonconforming simultaneously without divorcing one another. The limitations of study on creation of "queer(ed)" dissident notions of Malay Male identity in an increasingly globalised world, is what I find most valuable for future work in this field.*

Originality/value - *The paper hopes to contribute to the research on Malaysian Muslim identity and culture by illustrating gender nonconforming, alongside with normative expectations on Malayness and Muslimness, has great potential to coexist in one space and play an important role in identity creation among "queer" Malaysian Muslims.*

Keywords : queer, gender nonconforming, Instagram, social networks, Malaysian Muslim Identity

Track: Education

Pre-University Students' Perceptions of Online Learning during Covid-19: A Case Study in Malaysia

Mei Lick, Cheok[1]

[1]Multimedia University, [2]Tun Fatimah Form Six College

Abstract

Background - *Malaysian teachers had no choice but to join the bandwagon in delivering their lessons online. Many who had not adopted much of technology in their teaching and learning were forced to make a sudden shift overnight. Like it or not, even when one is reluctant, there was no other way but to roll up one's sleeve and start learning. Many online courses for teachers were made available, and top-down instructions made it impossible not to adopt the new way of teaching. But how do our students take it? Were they satisfied? Or are there areas where they feel teachers need to strengthen?*

Purpose - *How do educators know that they are doing the right thing when teaching online? How will they know what are the aspects that students would like them to improve and which are the ones they have got them right? Obviously by asking the students themselves. This paper describes what students liked and disliked in a recent online classes by their college. Findings can help educators improve their online practices; not as to how they perceived they should be, but according to students' perceptions.*

Design/methodology/approach - *The study utilised a qualitative method to investigate the perceptions of pre-university students from a college in Malaysia. A structured questionnaire was distributed to twenty students. A focus-group interview was also carried out with 6 students to further investigate and understand in greater depth these students' learning experiences.*

Findings - *Findings revealed educator's qualities like having a strong content and pedagogical knowledge as the strength of the online course, while poor internet connection and having more than one platform when running its teaching and learning as its weaknesses. Students also suggested offering incentives like giving bonus marks to encourage involvement. Room for opportunities and challenges presented are also discussed in the paper.*

Research limitations - *This study is limited to students undergoing a pre-university course in a college. Perhaps future studies could include perception of students from other courses and educational institutions.*

Originality/value - *This paper offers an analysis of online learning during the pandemic, as perceived by a group of pre-university students in terms of its Strengths, Weaknesses, Opportunities and Challenges (SWOC). This will help college instructors to better know and understand their students' perceptions and thus, improve their online instructional practices.*

Keywords : online teaching, COVID-19, education

Hands-on learning of chemistry concepts

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Abstract

Background - *Stoichiometry is among the most difficult chemistry concept to teach and it is often taught with emphasis on algorithmic understanding, i.e., calculation-based level of understanding without any emphasis on conceptual understanding, i.e., submicro (particulate) level of understanding.*

Purpose - *To ascertain if the use of dynamic submicro representations via hands-on learning activities comprising molecular models and molecular graphics can provide positive insights into students' understanding of stoichiometry.*

Design/methodology/approach - *An action research was carried out and it involved two cycles of lessons i.e., cycle 1 with static submicro representations (conventional learning with PowerPoint) to teach stoichiometry and cycle 2 with dynamic submicro representations (hands-on learning with molecular models and molecular graphics) to teach stoichiometry. The instruments used included (1) a stoichiometry test with structured questions (2) students' activity journals and (3) open-ended semi-structured interviews.*

Findings - *Students who had learnt stoichiometry with only static submicro representations, faced difficulties in understanding stoichiometry at the submicro level. Students can benefit from the use of dynamic submicro representations (via hands-on learning activities) in understanding stoichiometry at the submicro level. Positive changes in students' understanding were categorised as a change from a 'lack of understanding' to 'correct understanding'.*

Research limitations - *The scope of the research and the pedagogical restrictions encountered by the researcher are considered the limitations of this study.*

Originality/value - *The uniqueness of this study lies in its approach of involving hands-on learning activities in addition to conventional chemistry lessons on stoichiometry.*

Keywords : stoichiometry, submicro, action research, hands-on learning

Cultivating Environmental Counciousness Online among University Graduates

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Abstract

Background - *Environmental consciousness plays a major role in shaping people's attitudes towards ecological issues and nature. People who are aware of what impact their daily activities have on the environment choose eco-friendly lifestyles.*

Purpose - - *IPCC experts who evaluated about six thousand peer reviewed scientific publications stated that it is important to hold global warming at 1.5 degrees Celsius, otherwise destructive domino effects on the environment are foreseen. Therefore, political efforts to impede the rise of temperature and young generations' awareness of consequences of global warming are in need. Thus, the purpose of this research is to assess the readiness of adopting knowledge and awareness about the environment sustainability issues among on-job training graduates through an online learning platform.*

Design/methodology/approach - *This is a quasi-experimental study adopting a two-groups pre-test and post-test design. Two groups of participants with a total of 310 on-job training graduates were given 4 hours online intensive training on environment sustainability and social impacts through google classroom. Pre-test was given to the participants at the beginning of the training and post-test was given at the end of the training session via google form.*

Findings - *The results show that the post test (mean=74.98, std=.658) scores were better as compared to pre-test (mean=64.38, std=.631). However, the minimum score for post-test scores (min=25, N=310) were lower than pretest scores (min=20, N=310). The outcomes indicated that some students did not pay attention or had no interest in the training content. An additional survey had been carried out to explore the readiness of the graduates in mitigating global warming issues. More than 80% of the participants showed their interest in plant-based diet and changing their habits to protect the environment.*

Research limitations - *This study might be limited by the race of respondents as most of the participants were Malay and Muslim background. It might be interesting to find out, if the result of the survey would have changed, should it include people of different age, cultural and work backgrounds.*

Originality/value - *The results of the study may instil the understanding of the importance of environmental protection and propose solutions that contribute to environmental sustainability among the young generation and policy makers.*

Keywords : Environmental Consciousness, Global Warming, Environment Sustainability, Graduates

Parents' Struggles in Providing Educational Support for Online Learning during COVID-19 Pandemic in Malaysia

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[1,2,3]Multimedia University, [4]Sultan Abdul Halim Mu'adzam Shah International Islamic University

Abstract

Background - *The current battle against the COVID-19 pandemic has made drastic changes to the way we live. Teaching and learning sessions are conducted remotely and on digital platforms. Parents have to play an important role to ensure that their children are able to cope well with the new way of learning.*

Purpose - *This study aimed to identify the challenges faced by parents in providing educational support for online learning during pandemic Covid-19 in Malaysia.*

Design/methodology/approach - *Quantitative approach was used, and 100 respondents participated in this study. The selection of respondents was done randomly based on several criteria. Data were collected online based on open-ended questions related to home learning and parents' struggles.*

Findings - *The study identified three major themes which are personal struggles, technical struggles and financial struggles.*

Research limitations - *However, some limitations should be noted. First, we only included parents of primary school level students. Second, only parents who reside in Malacca would be our respondents. Third, our findings are limited to parents' personal, technical and financial aspects.*

Originality/value - *This study shed a light on parents' struggles in providing educational support for online learning during the COVID-19 outbreak in Malaysia. To overcome these struggles, some revisions and modifications are required to be done, including finding ways to provide assistance from schools, teachers, as well as the government. The implementation of new laws, regulations and suggestions may assist the parents to enhance the perceptions that parents have in handling their struggles during the COVID-19 pandemic. Other than that, there is a need to further study the role of the community and also the NGOs in helping parents to overcome their struggles in the future.*

Keywords : parents, online learning, struggles, COVID-19, Malaysia

Track: Languages

Importance of English in Malaysian Agricultural Organisations

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Abstract

Background - *The importance placed on having good English language proficiency and skills to secure employment in Malaysia is a well known fact. However, very little is known on the role of English in multilingual organisations within the agricultural industry in Malaysia. This is why we sought to examine the perceived perception of employees to the use of English in the professional and workplace context particularly in the Malaysian agricultural context.*

Purpose - *The purpose of this study is to examine the perception of employees from the agricultural industry towards the role and value of English in the Malaysian agricultural organisations.*

Design/methodology/approach - *Interviews were conducted with respondents from three organisations. Additionally, questionnaires were also disseminated to the employees from all three organisations. These were done to identify the perception of the different stakeholders on the role and value of English within the agricultural industry and workplace.*

Findings - *The respondents agree that having good English language skills plays an important role in their workplaces and there is an economic value attached to it. Nevertheless, the use of English followed by Bahasa Malaysia and other ethnic languages emerged as essential for communication in these three linguistically diverse agricultural organisations. It also shows the organisations are flexible in accommodating the use of Bahasa Malaysia and other ethnic languages which are essential for communication in a multilingual organisation.*

Research limitations - *The study was limited to 100 employees and only three agricultural organisations were investigated.*

Originality/value - *It is hoped that this study will provide a clearer understanding on the role and value of English, Bahasa Malaysia and other languages in the agricultural industry taking onto consideration that the communication process and languages do not exist in a vacuum. Furthermore, this study would be helpful in identifying the needs of the agricultural industry as the inability of our graduates to communicate effectively in English at the workplace has been a major cause of concern for decades.*

Keywords : agriculture, workplace communication, perception, English Language

Ghazal According to Kashmiri American Poet Agha Shahid Ali

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Abstract

Background - *For Agha Shahid Ali, a Kashmiri-American poet, the ghazal is an ancient form of lyric poetry that dealt with 'unrequited love, loss and longing'. He took issue with American poets such as Adrienne Rich.*

Purpose - *Ravishing Disunities, Real Ghazals in English was edited by Shahid Ali to compile ghazals according to his definition of the ghazal. In the Introduction to this book, he laid out the fundamentals of how the Urdu ghazal should be formulated.*

Design/methodology/approach - *I wrote 100 ghazals, keeping in mind the requirements by Shahid Ali. (1) the ghazals should be between 5-12 couplets; (2) contain no enjambments; (3) each couplet should stand alone; (4) should have a rhyme scheme and a refrain; (5) each line must be of the same length; (6) the last couplet should contain the takhalus (name of the poet); (7) the scheme of rhyme and refrain occurs in both lines of the first couplet and then only in the second of every succeeding couplet; and (8) in terse language that evokes constant longing.*

Findings - *The ghazals that were written did not consistently follow all the eight rules. Most of the ghazals were melancholic, and almost all had the refrain. A handful of the poems followed the rule on the takhalus. Many of the ghazals were enjambed, my ghazals told stories. What eventually emerged was a hybrid of Shahid Ali's ghazals, which I called Malaysian Hybrid English ghazals. This genre of ghazal is a hybrid of Shahid Ali's as there is a manifest use of many languages in the ghazals I wrote. Their multi-tonality speaks not only to the Malaysian condition of melancholia but also of the joy, particularly in the consumption of food. Also, Malaysian hybrid ghazals use this Muslim construct to embody Christian motifs.*

Research limitations - *The considerations were only on the Introduction to Ravishing Disunities.*

Originality/value - *First a collection of 100 Malaysian Hybrid English ghazals, a form not known to be attempted in Malaysia before. Secondly, a definition of a Malaysian Hybrid English ghazal.*

Keywords : Agha Shahid Ali, ghazal, takhalus, Malaysian Hybrid English Ghazal

A Close up of the Use of Weblogs and Blogging Buddies: A Case Study in Malaysia

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Abstract

Background - *Peer review or evaluation has been seen as a promising approach in helping students learn from one another instead of relying solely on their overwhelmed teachers for feedback on their writing work. There has been mixed reviews on the effectiveness of this method.*

Purpose - *This study aims to examine the groundwork that needs to be done before peer review could be conducted as we as to suggest an effective way to pair the blogging buddies to ensure that the students could benefit from each other.*

Design/methodology/approach - *A case study was conducted on 6 students from a private university in Malaysia.*

Findings - *The findings show that when the students are paired with a blogging buddy, there is an increased level of accountability. Moreover, the students' proficiency levels are important determinants in their pairing as buddies with an average proficiency level were found to be able to support their peers with lower English proficiency and vice versa. However peer review can only benefit students with high English proficiency if they were paired with a buddy with the same level of proficiency. Nevertheless, students who have a low English proficiency would not benefit if they were paired with someone with almost the same level of language mastery.*

Research limitations - *This case study only involved 6 students and would need a bigger sample in future work.*

Originality/value - *This study aims to provide a checklist to educators who might be interested to implement peer editing in their writing class as to the groundwork that they need to do and the ideal pairing of the students reviewers/editors.*

Keywords : Peer Review, Weblogs, Writing Skills

Genre Awareness among Foundation in Law Students

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Abstract

Background - *A text of different genre might pose a different problem to students and different genre requires different approach in understanding and comprehending it. Developing the expertise in reading legal texts at an early stage of learning will be very beneficial to the students of law.*

Purpose - *This study examines the level of foundation in law students' awareness for the case law genre, and the aim of this study is to investigate the extent of awareness of the case law genre among the foundation in law students.*

Design/methodology/approach - *Five students who were pursuing their study in the foundation level were selected as the subjects in this study. Qualitative data were obtained through the think-aloud procedure and questionnaire which was administered after the think-aloud procedure. The transcription of each student's verbal reports were scrutinised for evidence of genre awareness while the answers given in the questionnaire were used to support the findings of the study. Genre analysis of 4-Move structure was used to identify the students' level of awareness.*

Findings - *The findings indicate that the students are aware of the case law genre. However, they display a mixed-level of awareness.*

Research limitations - *The study is only limited among the foundation law students of Multimedia University, and as such the findings could not be generalised for all law students in other universities in Malaysia.*

Originality/value - *It is hoped that this study can provide an insights into the reading behaviour of law students especially when reading case law.*

Keywords : genre analysis, reading skills, awareness, case law genre

Rhetorical Analysis of Electrical Engineering Undergraduate Laboratory Report

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Abstract

Background - *This study examines the genre of Engineering Laboratory Reports (ELR) introduction section written by Electrical Engineering Undergraduates in a higher learning institution*

Purpose - *The aims of this study are to identify the rhetorical moves and combinations of move patterns used by engineering students to write introduction section of ELR.*

Design/methodology/approach - *A genre analysis was conducted to identify writing patterns and convention practices of engineering undergraduate students thus a corpus of N= 35 was selected from electrical engineering students in their final year of study. This study adopted Genre Theory as its theoretical framework, Ngowu (1997) analytical framework and Biber, Connor, Upton (2007) BCU approach for analysis procedure. A pilot test was conducted to determine the model that fits the best to describe moves and steps of ELR. The study benchmarks a move or step to be present in at least 60% of the reports*

Findings - *The finding shows the introduction consists of one main move which is providing background information of the experiment and followed by four subsequent steps which are reference to research purposes, reference to theoretical knowledge in the field, providing an overview of the study and identification of main research apparatus*

Research limitations - *The move 1 and all four steps identified above are viewed as conventional move and steps of introduction section only among undergraduates in academic context.*

Originality/value - *The exemplification in finding pave ways to address grey areas of improvement in scientific written genre among laboratory instructors and academics. The research method employed in this study may be replicated to analyse other sections of scientific and technical reports such as method, result, discussion and conclusion (MRDC).*

Keywords : Introduction section, laboratory reports, move analysis, engineering discourse.

Language Etiquette: Teaching and Learning Malay Language for Foreign Students

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Abstract

Background - *Any language teaching and learning process should include language etiquette. The learning of foreign languages at any stage is characterised by the interaction of numerous factors such as mother tongue, culture, educational background, and psychological factors, among others. The development of socio-cultural competency in teaching a foreign language is a challenging undertaking for a teacher. Foreign students from Sudan, Egypt, Indonesia, the Philippines, and other countries can learn Malay in one semester at Multimedia University.*

Purpose - *This paper examines at some of the challenges of teaching language etiquette to foreign students, as well as how foreign students use language etiquette in class.*

Design/methodology/approach - *The study used a field research method, i.e. the language method in its context, is used in this analysis. The data for this analysis was gathered through interviews and observations.*

Findings - *It was discovered through data analysis that the instructor should be aware of and appreciate the students' native culture as well as their cultural differences in the classroom. It helps all participants/ students to pick up the foreign language and its culture as well. In terms of cultural aspects, if the learner's socio-cultural competence is well defined and built during the language teaching process, he or she can be almost on par with native speakers. However, it should be noted that, while etiquette is a fixed part of culture, norms are constantly evolving.*

Research limitations - *This research focuses on foreign students' language etiquette in Malay language classes; however, potential research could focus on other courses or students' everyday lives.*

Originality/value - *The primary goal of foreign language teaching and learning is for students to be able to speak, comprehend, and be understood in a foreign language. The education of culture and linguistic etiquette is critical to achieving these goals.*

Keywords : language etiquette, foreign student, foreign language, Malay language, culture

Rapport Management in Intercultural Students' Group Work Interactions

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Abstract

Background - *Group work skills are commonly seen as an important generic outcome for all university students. Often, students working in groups for course assignments engage in potentially face-threatening interactions during discussions. The complication is compounded when these students represent culturally diverse backgrounds insuch intercultural communication.*

Purpose - *The study examines the complex intercultural communication that takes place during group work among university students. The study describes how managing rapport effectively in intercultural interactions can influence the quality of group work.*

Design/methodology/approach - *The ethnographically informed qualitative study involving participants who were first-year undergraduates taking a Business English course. Their group discussions were observed, interactions were audio-tapes and then transcribed for analysis. The study investigates the social intercultural interactions using Rapport Management as a framework to analyse intercultural interactions based on the concepts of face, sociality rights, and interactional goals.*

Findings - *The findings confirm that rapport orientation is a key influence in strategy choice, driven by the constructed social identities of the participants. The participants in the study employed mainly rapport-enhancement and rapport-maintenance, rather than rapport-neglect and rapport-challenge to achieve the successful interactional goals of group work.*

Research limitations - *The study gives priority to quality over quantity analysis so it may not be generalisable to other situations as this study is confined to verbal elements of interaction.*

Originality/value - *The findings suggest that education practitioners need to be aware and understand the dynamics of intercultural communication among students during their participation in group work.*

Keywords : rapport management, intercultural communication, social identity, interactions

The relationship between Academic Performance and Online Language Learning in Institute of Higher Education

Teow Boon Yan[1]

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Abstract

Background - *The current advancement in technology has greatly impacted the use of mobile technologies in our life specifically in a language learning classroom. The seamless and borderless method of teaching and learning has enabled both academics and learners to obtain information almost immediately. Electronic dictionaries and other educational online websites have been frequently used as main references. In view of the Covid -19 pandemic, online classes have been the most preferred option of virtual teaching. Both academics and language learners have to adapt and improvise learning methods according to the needs of each individual.*

Purpose - *The purpose of the study was to determine the correlation between summary writing, essay writing and grammar proficiency in Basic Academic Writing class that was conducted via online classroom at Multimedia University.*

Design/methodology/approach - *This is a quantitative correlational study employing multiple regression analysis to explore the relationship between the three variables. 51 students were randomly selected from undergraduate students who had enrolled into English language classes as the sample of the study. The students have gone through 14 weeks of online classes. Google Classroom, blended learning, quizzie, slides, chat room, jamboard were used to conduct the online classes. The students were given an online test at the end of the trimester to investigate their academic learning outcome in summary, writing and grammar*

Findings - *The results show that there is a significant correlation between students' grammar and summary ($r=0.72$, $p<0.01$); grammar and writing ($r=0.569$, $p<0.01$) and writing and summary ($r=0.662$, $p<0.001$) in online classrooms.*

Research limitations - *This study was limited to writing proficiency; reading, listening and speaking skills were not included. The internet coverage and WiFi connectivity may also limit the students' ability to obtain information effectively.*

Originality/value - *The results of the study will benefit the online classroom in teaching writing skills. However, it would be beneficial to explore further the relationship between other language skills and the learning aptitude of language learners using mobile applications.*

Keywords : Online learning, English language, writing skills, academic performance

Track: Psychology

Malaysia Undergraduate Students' Mindset of Intelligence

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Abstract

Background - *Mindset of intelligence refers to how people perceive their intelligence. A growth mindset of intelligence promotes one's effort to strive while a fixed mindset inhibits one's learning ability. Mindset of intelligence has been found to be influencing students' academic achievement and a growth mindset can be cultivated. Hence students' mindset of intelligence needs to be explored before plannings are proposed to enhance the effectiveness in teaching and learning.*

Purpose - *The purpose of the research is to identify university students' mindset of intelligence, and to explore the relationship between university students' mindset of intelligence and their demographic profile.*

Design/methodology/approach - *This is a quantitative and correlational study. Undergraduate students were selected randomly from a local private university as the sample. Students' mindset of intelligence was measured with a questionnaire of a seven-point Likert scale. Descriptive and correlational analyses were conducted to the data collected.*

Findings - *Overall, it was found that undergraduate students have a fixed mindset of intelligence. Comparing undergraduate students' mindset of intelligence, significant differences were identified between students of different levelas of study and field of study. Significant differences in students' mindset of intelligence were also found among students from different faculties and years of study in university. There is no gender difference in undergraduate students' mindset of intelligence. In addition, Undergraduate students' mindset of intelligence was found to be correlated to students' age, level of study, year of study and faculty at a moderate level. Undergraduate students' gender and field of study were found to be weakly correlated to their mindset of intelligence. No correlation was identified between undergraduate students' mindset of intelligence and their academic performance.*

Research limitations - *The study included only one local private university. Hence the results may not be suitable to be generalized to the undergraduate student population.*

Originality/value - *There is a limited number of studies conducted in Malaysia to investigate university students' mindset of intelligence. University students' mindset of intelligence has to be identified before deciding the need to cultivate a growth mindset in the teaching and learning process.*

Keywords : mindset of intelligence, fixed mindset, growth mindset, undergraduate students

Pandemic-related stress and resilience among digital workers

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[1]Multimedia University

Abstract

Background - *Artificial intelligence will combine with other emerging technologies in the future to take even more advanced positions and become digital workers. However, due to the spread of pandemic covid-19 throughout the world in early 2020, most jobs in the world have been transformed into digital works. Despite the pandemic, the world's soci0-economic structure must continue to operate in new normal in order for the country and its citizens to survive. To ensure the safety of the public, these employees are required to operate from home on certain days while still working in the workplace on other days, and they must adhere to strict standard operating procedure (SOP). The abrupt shift in the nature of works has caused anxiety and stress among digital workers. they work more than the standard 905 office hours without setting the clear boundary for their personal time. Worse, some major corporations have to close down and pay cuts or layoff of employees. Therefore, what are the pandemic-related stressors that these digital workers are to deal with and their resilience to thrive in this pandemic situation?*

Purpose - *The aim of the study is to explore the pandemic-related stress that these digital workers are to deal with as well as their resilience to thrive during the pandemic.*

Design/methodology/approach - *This is a qualitative project. It will use a thematic approach to gauge pandemic-related stressors and resilience in the face of a sudden threat during pandemic Covid-19. 15 people (digital workers) from different backgrounds will be interviewed with a structured questionnaire.*

Findings - *The finding is expected to get valuable input of the factors that may cause the pandemic-related stressors among these digital workers and their resiliency to thrive during the pandemic.*

Research limitations - *The outcome is the culmination of a qualitative approach to comprehend the feelings, ideas, and experiences of digital workers. In order to test hypotheses and assumptions, a quantitative analysis should be conducted.*

Originality/value - *The study explores the pandemic-related stressors among the digital workers as well as their ability to withstand the pandemic.*

Keywords : digital workers, resilience, pandemic-related stress, covid-19, thematic approach

Students' attitude and coping strategies on online learning in times of Covid-19 crisis

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[1]Multimedia University

Abstract

Background - *The emergence of the Covid-19 pandemic has caused widespread concern resulting in elevated levels of anxiety. This crisis has had an affect on Malaysian students in higher education, such as colleges and universities. Classes were postponed earlier in the lockdown, and most of classes are now held online. Digital mode, also known as online learning, is still ongoing at Multimeida University (MMU). Students were dispersed across Malaysia. To attend online classes, some students live in rural areas with minimal internet access. The condition has developed a problem that required the researchers' attention in order to comprehend the students' attitude and coping strategies.*

Purpose - *This study is meant to investigate MMU students' attitudes coping strategies with online learning classes during the Covid-19 pandemic.*

Design/methodology/approach - *This is a cross-sectional analysis of students at the MMU campus in Malaysia. Students respondents were determined using simple random sampling. They will answer online surveys developed through Google forms with an appended consent form. STudents acceptance of online learning courses can be used to gauge their attitude. The coping strategies questions were adapted from BSC (Brief Coping scale) with 28 items. It is hypothesised that there is significant correlation between students' attitude and coping strategies among MMU students with online learning classes during pandemic Covid-19.*

Findings - *The finding is expected that there is significant correlation between students' attitude and coping strategies among MMU students with online learning classes during pandemic Covid-19. Students who are positively accepting the online learning classes to be conducted fully are participating the best coping strategies method.*

Research limitations - *The study only focuses on students studying in MMU. Therefore, the outcome could not be generalised to all university students in Malaysia.*

Originality/value - *The primary goal of teh study is to investigate the attitudes and coping strategies of Multimedia University students when confronted with the unexpected pandemic Covid-19. The outcome may assist the related unit in understanding and developing strategies to assist the students.*

Keywords : Covid-19, pandemic, online learning, attitude, coping strategies

The influence of extroversion and introversion personality types on virtual learning during ppandemic covid-19 crisis

Siti Rasyidah binti Sanudin[1]

[1]Multimedia University

Abstract

Background - *Extroversion-introversion (E- I) variations have been shown to affect how students become engaged in class, the behaviour or steps they take to learn and appreciate course material, and the way they process knowledge. According to research, extroverts enjoy events such as classroom discussions, group projects, and opportunities to engage with the teacher and hammer out ideas through conversation. They have a diverse range of interests, proactive with their work and relationships, sociable, and have a strong sense of self-expression. Introverts, on the other hand, may tend to engage in activities such as listening, lab work, and reflection before responding to questions from teachers. They prefer writing as a means of communication and contemplation as a means of working out ideas. This is also how they like to learn. Introverts are more discreet than extroverts. Inytrovers perform best when given time to reflect and process before participating in classroom activities, while extroverts need a high degree of stimulus to stay involved. The world is now under threat from the Covid-19 pandemic. As a result, all courses are taken entirely online. Therefore, it will be interesting to see the influence of these two diametrically opposite personalities on full-time virtual learning classes during the Covid-19 pandemic.*

Purpose - *This paper aims to explore the influence of extroversion and introversion personality types on virtual learning during the pandemic covid-19 crisis.*

Design/methodology/approach - *The phenomenological analysis is used to extract an individual's narrative of their perceptions and emotions, and to create a detailed explanation of the virtual learning between the two opposite personalities.*

Findings - *It is expected to get an in-depth explanation on how the two opposite personalities influence fully virtual learning classes during the pandemic Covid-19.*

Research limitations - *The end result is the manifestation of a qualitative approach to understand how the extroverts and introverts differ in their perception and acceptance toward fully virtual learning classes. Quantitative analysis should be carried out to test hypotheses and assumptions.*

Originality/value - *The study explores two diametrically opposite personalities and how the difference in personality may influence their perception and acceptance toward fully virtual learning classes.*

Keywords : personality, extroversion, introversion, Covid-19, virtual learning

The Job Applicant Reactions towards Patterned Behavior Description Interview (PBDI) and Mixed Situational Interview and Patterned Behavior Description Interview (Mixed SI PBDI)

Masyitah Mahadi[1]

[1]Multimedia University

Abstract

Background - *Applicant reactions are defined as the extent to which the applicants perceive the selection process as fair. Two popular types of information asked in structured interview are questions that inquire about future behavior - Situational Interview (SI), and questions that ask about past behavior -Patterned Behavior Description Interview (PBDI).*

Purpose - *There are past researches studying the effect of using SI or PBDI on applicant reactions and many findings showed that PBDI has the highest applicant reactions. Based on the past studies and findings, the current study then considered to examine the different effect of using PBDI and Mixed SI and PBDI (Mixed SI PBDI) on job applicant reactions.*

Design/methodology/approach - *Forty-six job incumbents holding the post of foundation teacher from the Centre for Foundation Studies in International Islamic University Malaysia (IIUM) were conveniently selected to participate in the experiment. The materials that were used in the present study consisted of (a) Questions during the interview, the Mixed SI PBDI, and PBDI and (b) Questionnaires which consisted of applicant reactions based on Organizational Justice theory. The interview was presented in a transcript and after answering the interview transcripts, participants were asked to answer the applicant reactions questionnaires. The data then was analyzed and presented.*

Findings - *The results showed a significant difference between PBDI and MIXED SI-PBDI with the mean for PBDI ($M = 13.61$; $SD = 1.57$) was significantly greater than the mean for MIXED SI PBDI ($M = 10.89$; $SD\ 1.91$), $t\ (46) = 7.22$; $p < 0.01$. Particularly, applicants reacted more postively to PBDI interview content compared to Mixed SI and PBDI.*

Research limitations - *This research has few limitations such as the interview was not conducted verbally as in real workplace context and it is limited to studying the reactions in terms of only perceived fairness and not other elements such as organizational effectiveness or applicant decision making.*

Originality/value - *Nevertheless, this study has contributed significantly to the theoretical and research development in applicant reactions, and to the practical application of the findings to Malaysian organizations.*

Keywords : Job applicant reactions, Past Behavior Description Interview (PBDI), Mixed SI and PBDI (Mixed SI PBDI), selection process, structured interview content.

Track: Social Science

Adoption Factors of Gamification in Learning among Students

Siti Nurul Huda Mohd[1], Haniza Hashim[2], Shadia Suhaimi[3], Nurbaiti Shafee[4], Soong Kee Feng[5]

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Abstract

Background - *Gamification is treats as to engage learners to absorb knowledge. The learners will look at gamification as a leader board and would try to climb it. Gamification would add game mechanics to a non-game situation to encourage engagement. Although their contents are not the same, but the goals of both is nearly the same as both are promoting learning using game-based thinking and techniques (Kapp, 2012)*

Purpose - *The purpose of this research is to investigate the student perception on gamification in learning and it will focus on the factors that will influence the adoption of gamification in their learning.*

Design/methodology/approach - *The questionnaire was given out to 151 respondents via Google Form to students from Multimedia University (MMU). The data was interpreted using SPSS software through frequency analysis, descriptive analysis, reliability test and multiple linear regression. These methods will determine the significant relationship between behavioural engagement, cognitive engagement, emotional engagement and perceived ease of use that are the factors affect the adoption of gamification in learning among students.*

Findings - *The result for this research shows that both the behavioral engagement and emotional engagement with p-value of 0.000 have significant positive correlation with the adoption gamification in learning among MMU students as the p-value is less than 0.05. Same goes to cognitive engagement that has a p-value of 0.028. However, it was found that perceived ease of use has a no significant relationship with the p-value of 0.862 which more than 0.05.*

Research limitations - *The limitation of conducting this research is the data collection of questionnaire. The questionnaire was conducted online using google form may need more time to collect the data compare with face to face distribution. Face to face contribution would be faster as they will fill up the form on spot if they agree to participate in the research. However, when the questionnaires are distributed online, the respondents would either ignore it or might not answer it immediately.*

Originality/value - *This research will let the academicians in university know the learning trends nowadays, and provide some inspiration for them to adopt gamification onto their lectures.*

Keywords : Gamification, Behavioural Engagement, Cognitive Engagement, Emotional Engagement, Perceived Ease of Use

Factor Influencing Behavioural Intention Towards Mobile Payment System Adoption Among Malaysian Youth

Shadia Binti Suhaimi[1]

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Abstract

Background - *Mobile payment system is one of the way to pay for products, services, bills and invoices. Nowadays, mobile devices such as smart phones, wireless communications technologies such as mobile telecommmunications networks are very important in making paymets. The use of mobile payment systems is now becoming a trending all over the world. By increasing number of users in the mobile payment systems, thereforw it has been foreseen as a popular method to make a payment in the future.*

Purpose - *This research is intended to determine the factors that affecting the behavioural intention towards the adoption of mobile payment systems among Malaysian youth.*

Design/methodology/approach - *The target respondents in this research are 300 Malaysian youths and the data collect from the respondents through online questionnaire. Behavioural intention towards adoption of mobile payment is a dependent variable and there are five (5) independent variables which are; performance expectancy, effort expectancy, social influence, perceived risk and perceived cost. The data then collected from the respondents and all data are analysed using SPSS.*

Findings - *The results of the study are concluded that the independent variables of performance expectancy, effort expectancy, social influence, perceived risk and perceived cost have significant relationship towards the behavioural intention towards the adoption of mobile payment systems among Malaysian.*

Research limitations - *There are significant barriers that appear in the study that happen out of researchers' control and can be improved in future study. The first limitation is the number of sample size that use in the study. Next is spread of demographic and last one is time constraint*

Originality/value - *However, it is necessary to carry out this research in order to investigate whether Malaysian have intention in using mobile payment systems and examine the factors that lead to intention of using mobile payment systems retail business and m*

Keywords : Mobile payment system, youth, influence

Dimension of Digital Patriotism towards Digital Society Development

Mohd Hairul Anuar Razak[1], Halizah Awang [2], Mohd Mahadee Ismail[3]

[1]Multimedia University, [2]Universiti Tun Hussein Onn, [3]Universiti Putra Malaysia

Abstract

Background - *Patriotism is a feeling of national love while virtual means digital or cyber. However, the acceptance and dissemination of virtual patriotism in political communication can take place digitally through the use of information and communication technology (ICT). Various issues related to politics, country, government, society, environment and others are often discussed in ICT platforms especially social media. The focus on virtual patriotism is a new dimension that needs to be studied today. Virtual patriotism is a reflection of a state that only happens in virtual or digital. However, patriotism needs to be manifested from the unreal to the real. Self-aware individuals are responsible for bridging the two gaps from virtual to reality. This is called virtual patriotism.*

Purpose - *The main aim of this study is to identify virtual patriotism in the context of Malaysian reference*

Design/methodology/approach - *This study used a qualitative approach and content analysis research method used to identify patterns in recorded communication by focusing on interpreting and understanding data. Data were collected systematically based on existence and frequency of concepts in a text (conceptual analysis). The selection of the sample based on several criteria which the text in writing whether print or electronic media and the focus was on the text of the leader's speech during the national independence month celebration.*

Findings - *The findings of the study show that the elements of virtual patriotism in the field of Malaysian political communication must have the characteristics of ethical and moral patriotism, social norm patriotism, environmental patriotism, constructive patriotism, advocacy patriotism, symbolic patriotism, constitutional patriotism, nationalistic patriotism and blind patriotism.*

Research limitations - *However, with the use of ICT and technologies such as the internet and social media there has been a new perception towards understanding and behavior of patriotism and a connection between virtual patriotism and the political state of patriotic.*

Originality/value - *The focus on virtual patriotism is a new dimension that needs to be studied today. Virtual patriotism is a reflection of a state that only happens in virtual or digital. However, patriotism needs to be manifested from the unreal to the real. Self-aware individuals are responsible for bridging the two gaps from virtual to reality. This is called virtual patriotism.*

Keywords : Information and Communications Technology (ICT), Patriotism, Political Communication, Virtual Patriotism and Digital Patriotic.

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CONFERENCE CHAIR MESSAGE

We are delighted to welcome you to 1st International Conference on Law and Digitalization 2021 (ICLD 21) by Multimedia University (MMU), Research Synergy Foundation (RSF), and Canadian University, Dubai (CUD) that held virtually on June 21-23, 2021.

The Faculty of Law (FOL), Multimedia University will hold the 1st International Conference on Law and Digitalization 2021 (ICLD 21) on 21 – 23 June 2021 (Virtual Conference). ICLD21 will be part of the bigger Digital Future Congress (DIFCON 2021) comprising of various other conferences of multidisciplinary academic interests.

The aim of ICLD21 is to provide a platform for both local and international academics, practitioners, policymakers, researchers and students to meet, share ideas and knowledge in law and digitalization through paper presentation. It also aims to encourage academic linkages between the academicians and the researchers from the legal fraternity. It also promotes future co-operations among the intellectuals from various fields and disciplines.

It has been our privilege to convene this conference. Our sincere thanks, to the conference organizing committee; to the Program Chairs for their wise advice and brilliant suggestion on organizing the technical program and to the Program Committee for their through and timely reviewing of the papers. Recognition should go to the Local Organizing Committee members who have all worked extremely hard for the details of important aspects of the conference programs and social activities.

We welcome you to this conference and hope that this year's conference will challenge and inspire you, and result in new knowledge, collaborations, and friendships.

Best regards,

Dr Yang Chik Adam

ICLD Conference Chair

CONFERENCE CHAIR

Dr Yang Chik Adam

Yang Chik Adam is attached to the Faculty of Law (FOL), Multimedia University, Melaka Campus since 01 December 2016. As of 01 March 2018, resumed the position as the Deputy Dean Research and Innovation. She obtained her doctoral degree on corporate law and corporate governance from the International Islamic University Malaysia.

Prior to joining FOL, Yang Chik Adam was a lecturer at the Faculty of Law, Universiti Teknologi MARA, Shah Alam, Selangor. She taught at the Post Graduate Programme in Securities Law & Regulation, Corporate Governance and Company Law. At the Undergraduate Programme, Final Year (Honours) in Non-Contentious Legal Matters (components of Company Law), Law of Associations II, Law of Associations I and Media Law. For administrative post held as the Head of the Quality Unit for the Faculty. She is a Research Fellow at the Research Institute of Accounting, HCoE, UiTM, Shah Alam, Selangor.

She has practiced as a litigation and corporate lawyer as well as Peguam Syarie in the States of Federal Territory and Negri Sembilan. She was also in the corporate sector while with Malaysian Airline System Berhad (Malaysia Airlines) as the Senior Legal & Secretarial Officer. At Malaysia Airlines she obtained the Company Secretary License from the Companies Commission of Malaysia and practiced as the company secretary for some of the Malaysia Airlines subsidiary companies then.

Her research interests are in the area of Corporate Governance, Company Law, Securities Law & Regulation, Corporate fraud and crime, Corporate Governance and Forensic Accounting, Media Law, Syariah Family Law and Clinical Legal Education.

KEYNOTE SPEAKER

Prof. Dr.Aiman @ Nariman Binti Mohd. Sulaiman

Dr Aiman is a Professor of Corporate Law at the Ahmad Ibrahim Kulliyyh of Laws (AIKOL), International Islamic University Malaysia (IIUM). Currently a member of the Bursa Malaysia Market Participants Committee, a member of the Malaysian Institute of Accountants Ethics Standards Board and the Malaysian Bar Advocates & Disciplinary Committee, she has also served as a member of Bursa Malaysia Listing Committee (2008-2012;2014-2019).

She has been a faculty member at AIKOL, IIUM since graduating from IIUM in 1993 with a First Class (Hon) and subsequently completed her doctoral degree at Bond University, Australia in 2000 with a thesis on the enforcement of corporate law.

In more than 20 years in academia in teaching, researching and consulting, her body of work covers company law and corporate governance, capital market law, insolvency law and financial services law, enforcement and accountability strategies, shareholders empowerment and activism and mis-selling of financial products in the financial services industry. Previous research included the governance of higher education institutions, and compatibility of modern/conventional corporate and capital market rules with Islamic principles. One of her most significant contribution is the review of the Companies Act 1965 by recommending the establishment of the Malaysian Corporate Law Reform Programme as well as being the consultant for the project (2004-2008) which were instrumental to the Companies Act 2016. She has been Visiting Professor at School of Law, Bond University and Fakultas Hukum Universitas Indonesia and was a recipient of the Australian Endeavour Fellowship Award (Nov 2012-April 2013).

KEYNOTE SPEAKER

Madam Geeta Gnanarajah

Madam Geeta Gnanarajah graduated with a Bachelor of Laws Honours (LLB) from the University of Warwick, Coventry, United Kingdom in the year

1991. Thereafter, she completed her Certificate of Legal Practice ("CLP") in 1992. This was followed by her chambering in the legal firm of Messrs Shook Lin & Bok in 1993. Madam Geeta Gnanarajah was called to the Malaysian Bar as an Advocate and Solicitor of the High Court of Malaya on 4th March 1994. After approximately five (5) years at Messrs Shook Lin & Bok, Madam Geeta Gnanarajah joined the legal firm of Messrs A. Gnanarajah & Co.

Messrs A. Gnanarajah & Co. was founded in the year 1992 by Dato' A. Gnanarajah D.I.M.P., J.S.M., J.M.W. , A.M.N. who was formerly the Director Legal Affairs City Hall, Kuala Lumpur. He retired after twenty-five (25) years of dedicated public service. Dato' A. Gnanarajah is the author of the well-known Local Government and Planning Book Laws of City Hall, Kuala Lumpur with Cases and Commentaries published by International Law Books Services (ILBS) in 1992, his legacy to Datuk Bandar Kuala Lumpur and the City of Kuala Lumpur.

Madam Geeta Gnanarajah has been in active legal practice for more than twenty-seven (27) years. She is a Partner of Messrs A. Gnanarajah & Co. Madam Geeta Gnanarajah has a Master's Degree in Law (LLM) from the University of Malaya, Kuala Lumpur in the areas of Company Law, Intemational Trade, Employment and Air & Space Law, which was awarded in the year 2000 by The Chancellor of the University of Malaya, His Royal Highness the Sultan of Perak Sultan Azlan Shah.

Apart from handling conveyance and banking, our Madam Geeta Gnanarajah's forte is in General Litigation and Civil Claims, Company Law, Tenancies, Probate & Administration and Land Acquisition.

Our Madam Geeta Gnanarajah works right from dealing with clients regarding doubts they have and suggests practical approaches to be taken in order for the case to be favourable up to attending court matters. She is very much dedicated to her profession, proficient in her job duties and responsibilities and consistently is more than willing to go beyond what is expected to achieve goals and objectives with utmost professionalism and ethics. Our Madam Geeta Gnanarajah has always been very particular and meticulous in undertaking and completing a given task with much sincerity and commitment.

Briefly, with Clients — dealing with daily correspondences on files, meeting with clients, filing of legal documentation, rendering of legal opinions, liaising with clients for their approval on suggested approaches, advising clients on the merits of their Claims and / or the grounds to defend their case, liaising with opposing Solicitors, etc.

Briefly, specifically on Court matters — taking clients' instructions, advising clients, rendering legal opinions, issuing pre-action letters, serving documents and cause papers, drafting of legal documents including pleadings and affidavits, etc., instituting legal proceedings, the preparation ofthe Bundles of Documents and Bundles of Authorities, attending the Magistrates Courts, Sessions Courts and High Courts for hearings and trials as well as attending the Court of Appeal and Federal Court, negotiation of settlements and recording of Consent Orders etc.

For her excellence and pure dedication, our Madam Geeta Gnanarajah is a member of the Disciplinary Committee Panel ("Lembaga Tatatertib Peguam Bela & Peguam Cara") pursuant to Section 96 of the Legal Profession Act 1976.

SESSION CHAIRS

Dr. Anna Riana Suryanti Tambunan

Anna Riana Suryanti Tambunan is a fulltime lecturer at Universitas Negeri Medan, Indonesia. She obtained her doctoral degree in English Language Education, Universitas Pendidikan Indonesia, Bandung, Indonesia. Her research interests are Teaching English as A Foreign Language, writing feedback, intercultural communication, linguistics and literature.

Ms. Azwina Wati Abdull Manaf

Ms. Azwina Wati Abdull Manaf was called to the Bar in December 2005 and practice law as a Legal Assistant with Messrs. Mohamed Ridza & Co, Kuala Lumpur and later in several firms. She had experience in corporate, conveyancing as well as civil litigation matters before joined MMU in 2012. Currently she is a Chair for Centre of Shariah Law of the Faculty of Law, Multimedia University, Melaka.

Mr. Anak Agung Gde Satia Utama

Agung is Assistant Professor at Department of Accounting, Faculty of Economics and Business, Universitas Airlangga, since 2005. Currently, as PhD Student in Accounting. The research focus is accounting information systems, qualitative methods, sustainability, and Big Data. Expert in qualitative analysis data processing NVIVO Software. Active as a speaker and moderator at national and international seminars. More than 60 publications in international and national journals, as well as 7 book chapters. Associate Editor in several National Accreditation Journal, International Scopus indexed and national journal reviewers, and regular reviewers at various Top international conferences. Member of the Association Information Systems (AIS), Association of Qualitative Research Consultants (QRCA), Asian Qualitative Research Association (AQRA), British Academy of Management in the UK (BAM), Indonesian Qualitative Researchers Association (IQRA), BAFA, AFAANZ, Chartered Accountants, Southeast Asia Research Academy (SEARA), etc. Agung is still working on several research projects, international collaborations, Supervisors of several international students in the Nusantara Project-AIBPM and publishing books.

CONFERENCE PROGRAM

Day 1, Monday, June 21st, 2021

Time (UTC+8)	*Dur'*	*Dur'*	*Activity*
ICLD Room 1			https://us02web.zoom.us/j/82264689707?pwd=OTVLbXZkOVhTaFl1Q3ZlUVFFc1JhQT09 Meeting ID: 822 6468 9707 Password: DIFCON21
13:00 - 13:05	0:05	5'	**MC Welcoming**
13:05 - 13:45	0:40	40'	KEYNOTE I: SPEAKER: PROFESSOR DR. AIMAN NARIMAN BT. MOHD SULAIMAN
13:45 - 13:50	0:05	5'	Session Chair Introduction
13:50 - 15:20	1:30	90'	**Presentation Session 6 person** 15 minutes/presenter
15:20 - 15:30	0:10	10'	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
15:30 -			Break & Announcement to go to Main Room at 16.30

Day 2, Tuesday, June 22nd, 2021

Time (UTC+8)	*Dur'*	*Dur'*	*Activity*
ICLD Room 1			https://us02web.zoom.us/j/88107162071?pwd=VktuSWhpM0xWcmN0bFlKN1RmVXJpdz09 Meeting ID: 881 0716 2071 Password: DIFCON21
9:30 - 9:40	0:10	10'	**MC Welcoming**
9:40 - 10:20	0:40		KEYNOTE 2: SPEAKER: MADAM GEETA GNANARAJAH
10:20 - 10:25	0:05	5'	Session Chair Introduction
10:25 - 11:40	1:15	75'	**Presentation Session 5 person** 15 minutes/presenter
11:40 - 11:50	0:10	10'	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
11:50 -			Break & Announcement to go to Main Room at 16.30

Day 1: Monday - June 21, 2021

ICLD - Room 1

https://us02web.zoom.us/j/82264689707?pwd=OTVLbXZkOVhTaFl1Q3ZlUVFFc1JhQT09
Meeting ID: 822 6468 9707
Password: DIFCON21

Session 1: 13.50 - 15.20 (UTC+8)

Session Chair: Dr. Yang Chik Binti Adam & Dr. Anna Riana Suryanti Tambunan

Track Civil Law

Paper ID	Presenter	Paper Title
CLD21111	Dennis W K Khong	Liability from Artificial Intelligence Applications in Medical Practice: A Comparative Study Between English and Taiwanese Tort Laws

Track Sociology of Law

Paper ID	Presenter	Paper Title
CLD21101	Dr Tan Swee Leng	E-Commerce and Cybersecurity for the Elderly : A Participatory Action Research Study with Activity Centre for the Elderly (Pusat Aktiviti Warga Emas) Sepang

Track Law

Paper ID	Presenter	Paper Title
CLD21102	Eng Siang Tay	Statutory Lien after the 2016 Amendments to the Malaysian National Land Code
CLD21103	Su Wai Mon	Artificial Intelligence in Suppressing Piracy in High-Risk Areas: A Viable Solution?
CLD21104	Julia Farhana	The Liability of Artificial Intelligence's Moral Dilemma
CLD21105	Chee Ying Kuek	Legal Implications of Prenatal Diagnosis in Malaysia

Day 2: Tuesday - June 22, 2021

ICLD - Room 1

https://us02web.zoom.us/j/88107162071?pwd=VktuSWhpM0xWcmN0bFlKN1RmVXJpdz09
Meeting ID: 881 0716 2071
Password: DIFCON21

Session 1: 10.25 - 11.40 (UTC+8)

Session Chair: Ms. Azwina Wati Abdull Manaf & Mr. Anak Agung Gde Satia Utama

Track Corporate Law

Paper ID	Presenter	Paper Title
CLD21108	Yang Chik Adam	Digitalisation and Corporate Law: The Impact on Shareholders' Rights

Track Law

Paper ID	Presenter	Paper Title
CLD21110	Hua Siong Wong	Electronic Signature and Attestation in Conveyancing Practice: A Malaysian Legal Perspective
CLD21112	Manique AE Cooray	Internet Addiction among Adolescents in Malaysia: Legal Discourses and the Law of Juvenile Delinquency

Track Law and Economics

Paper ID	Presenter	Paper Title
CLD21106	Bahma Sivasubramaniam	The Unbearable Position of Being: Sexual Harassment at the Workplace
CLD21109	Gita Radhakrishna	Crowdfunding an Innovative Financing for Real Estate Transactions

Track: Civil law

Liability from Artificial Intelligence Applications in Medical Practice: A Comparative Study Between English and Taiwanese Tort Laws

Dennis W K Khong[1], Wan-Ju Yeh[2]

[1]Centre For Law And Technology, Faculty Of Law, Multimedia University, [2]Department Of Law, National Cheng Kung University, Taiwan

Abstract

Background - *Artificial intelligence technology is increasingly being used in medical practices, both for diagnostic and treatment purposes. As with any technological application, mistakes leading to harm and injuries are inevitable, although certain strategies may be used to minimise such mistakes. This study compares English and Taiwanese laws' approaches to tort liability for artificial intelligence applications in medical practice, as a representation of a Common Law and a Civilian Law approach.*

Purpose - *The purpose of this research is to comparatively investigate how tort law in English law and Taiwanese law are similar and different in the treatment of liability for artificial intelligence applications in medical practice.*

Design/methodology/approach - *The methodology employed is doctrinal legal studies involving the investigation of relevant English and Taiwanese laws on damages from artificial intelligence application in medical practice.*

Findings - *One of the questions in tort liability is to identify the parties who have a duty of care. In the case of artificial intelligence applications in medical practice, the potential parties include the medical personnel, healthcare institutions, manufacturers, and software and artificial intelligence developers. In English tort law, the default standard of liability is the negligence rule, although special considerations are applied when it concerns professionals' decision-making and actions. Unlike English tort law, Taiwanese law treats product liability as a special form of tort liability. Due to the application of this product liability, the standard of strict liability becomes the predominant standard of liability in Taiwanese tort law for medical systems using artificial intelligence technology.*

Research limitations - *The study is confined to tort liability and does not include liability from contractual relations. Also, only English tort law and Taiwanese law are studied.*

Originality/value - *This study provides a new perspective on how English law and Taiwanese law treat the issue of tort liability from the use of artificial intelligence technology in medical practice.*

Keywords : Tort liability, Artificial intelligence, Medical practice, English law, Taiwanese law

Track: Sociology of law

E-commerce and Cybersecurity for the Elderly: A Participatory Action Research Study with Activity Centre for the Elderly (Pusat Aktiviti Warga Emas) Sepang

Dr Tan Swee Leng[1], Rossanne Gale Vergara[2], Dr Shereen Khan[3]

[1,2,3]Multimedia University

Abstract

Background - *The Dasar Komuniti Negara (DKN) Malaysia or National Community Policy was formulated to improve the lives of the B40s or bottom 40 percent income group. The DKN is part of the National Housing Policy/Dasar Perumahan Negara 2018-2015 with eight clusters. The first cluster is caring for the needy, elderly , women , children and disabled. The other is for entrepreneurship and social business. Currently, the elderly in Malaysia need assistance in becoming more self sustainable. Hence, digitalizing the elderly ie. e-commerce will also require cybersecurity awareness training due to potential cybersecurity threats when conducting an online business. This study presents the phases in developing a framework to digitalize the elderly in Activity Centre for the Elderly or Pusat Aktiviti Warga Emas (PAWE) Sepang, resulting from a Participatory Action Research study. The stakeholders received coaching in e-commerce and cybersecurity, which is also in line with the DKN, IR4.0, Personal Data Protection Act 2010, and Computer Crimes Act 1997.*

Purpose - *This research will help PAWE Sepang to increase the online visibility of their handmade products and to enable them to live with dignity and become self sustainable, as 15% of Malaysia's total pupulation will be age 60 and above or reach an "aged nation" status by 2030.*

Design/methodology/approach - *This Participatory action research was conducted with members in PAWE Sepang through focus group discussions. Each focus group consisted of 6-8 people per meeting. After identifying the problems in the focus groups, an e-commerce platform was developed for the elderly to commercialise their existing products. The dissemination of e-commerce training and cybersecurity awareness was also conducted as part of the migration to online transactions.*

Findings - *The findings show that PAWE Sepang members were interested in participating in e-commerce and commercialise their products online. A website was created for them to showcase their products to conduct e-commerce.*

Research limitations - *Due to Covid-19 pandemic, scheduling focus group meetings with the elderly was the main challenge.*

Originality/value - *This study contributes to empowering the elderly community in PAWE Sepang. Thus, enabling them to be self-sustainable, live in dignity and be independent.*

Keywords : Online social entrepreneur, Cybersecurity, Technology, Elderly

Track: Law

Statutory Lien after the 2016 Amendments to the Malaysian National Land Code

Eng Siang Tay[1], Ging Yee Ling[2], Kwok Whee Chung[3]

[1]Faculty Of Law, Multimedia University, [2]Gordon Conveyancing, [3]David Allan Sagah & Teng, Advocates (bintulu Branch)

Abstract

Background - *A statutory lien is a non-registrable security dealing under the National Land Code ("NLC"). A lien over the land is usually used as a short-term collateral for a repayment of debt by the proprietor. Prior to the 2016 Amendments ("Act A1516"), section 281(1) of the NLC provides that a proprietor may create a lien over his land by deposting the original title with the lender, as security for a loan; and by entering a lien-holder's caveat under section 330(1). Cases show that judges have expanded the meaning of "proprietor" to include equitable owner; and section 281 allows the creation of a third-party loan with the proprietor's consent or authority. The amendment may seriously affect the proprietor's interest.*

Purpose - *The Act A1516 has deleted the phrase "for a loan" in ss 281(1) and 330(1) which trigger the analysis on the purposes of creation of the lien.*

Design/methodology/approach - *The research methodology adopted is by way of doctrinal legal research. Relevant sections and case law together with the Bill and Parliament's Hansard record are examined to find the intention of the legislature and Parliament.*

Findings - *The amendments allow the lien not merely as security for a loan but also for other purposes (Explanation Note 47 to the Bill). Such deletions create ambiguity in interpretation. These may include any other purposes such as Islamic financing, licensed or unlicensed moneylending, or for even no purpose. This may allow the manipulation if the land title is in the wrong hand. It is unclear if analogy can be drawn from the registered charge, another recognised security transaction under the NLC. Section 241(1) specifies that the land may be charged for the repayment of debt, non-debt, or payment of annuity or periodic sum.*

Research limitations - *This research is only confined to the scope of lien within the Peninsular Malaysia and not the States of Sabah and Sarawak which have their respective Sabah Land Ordinance and Sarawak Land Code. A future comparative study could be made amongst the legislations.*

Originality/value - *The research output may be useful for the draftman to clear up the ambiguity in the relevant provisions.*

Keywords : lien, title, purpose, for a loan, dealing

Artificial Intelligence in Suppressing Piracy in High-Risk Areas: A Viable Solution?

SU WAI MON[1]

[1]Multimedia University

Abstract

Background - *Artificial Intelligence generally refers to the computer systems performing "intelligent" tasks such as "visual perception, reasoning and decision making." The use of AI technology in naval operations has grabbed the attention of strategic planners worldwide. Apart from the conventional maritime security threats such as naval warfare, other non-tradition security threats such as piracy are also a great concern for global maritime security. Therefore, the role of AI technology in suppressing piracy could be considered.*

Purpose - *This research aims to argue that the use of AI technology is the viable solution to suppress maritime security threats particularly the crimes of piracy by law enforcement authorities in more efficient manner by identifying the possible patterns of suspicious activities from the pirates and other criminals in the seas.*

Design/methodology/approach - *In this research paper, the piracy high risk areas and existing challenges of law enforcement authorities in identification of potential attacks are examined and it also accesses the viability of the use of AI technology to reduce the piracy incidents by using proactive measures with the assistance of modern technology.*

Findings - *It is noteworthy that piracy is the most rampant maritime crime endangering global economies and the safety of lives of seafarers traversing through the High-Risk Areas such as Gulf of Aden, Indian Ocean, Sulu Archipelagoes etc. In most cases, suppression of maritime security threats is executed by the navies or other maritime law enforcement authorities such as coastguard agencies. As for the ships passing through the piracy prone areas, it is important that they are equipped with modern technology such as AI based radar systems for them to be able to detect the potential pirate attacks and maritime anomalies in advance and thus, giving them sufficient time to re-route avoiding the threats or call for an assistance in countering the attacks.*

Research limitations - *This research does not cover the technological perspective such as specific AI technologies to be used in suppression of maritime security threats.*

Originality/value - *This research contributes the literature in the field of maritime security by recommending the AI technology as the viable solution for more efficient counter piracy operations.*

Keywords : maritime security, piracy, law enforcement, AI, navy

The Liability of Artificial Intelligence;s Moral Dilemma

Julia Farhana[1], Saidatul Nasuha binti Jamaludin[2]

[1,2]Multimedia University

Abstract

Background - *Artificial Intelligence (AI) represents the fundamentals of the Fourth Industrial Revolution. Its advancement in technology has brought benefit to mankind over the years which helps to amplify our daily lives in numerous ways. Among the technologies that have been innovated are Artificial Intelligence Lawyers (AI Lawyers), autonomous vehicles, Judge AI, augmented drafting services and delivery drones which are slowly taking over the market. Although AI has brought a lot of advancements in our lives, concerns are raised with regards to the moral implication of AI.*

Purpose - *The purpose of this paper is to examine the situation where tools which incorporate AI would have to face a moral dilemma situation or in situations where A had acted beyond what was instructed or programmed by the manufacturers. Thus this paper discusses whether torts theory of liability on negligence is applicable in such situations.*

Design/methodology/approach - *A qualitative approach is adopted in this research by using a doctrinal research in analysing the legal rules and existing literature in relation to AI and negligence principle to develop a critical analysis of the literature. A comparative analysis is also adopted in other countries, particularly in the United States. The comparative analysis is to examine how the liability theories concerning AI are considered nd delat with in other countries.*

Findings - *The findings of the research suggested that the question of liability of AI is still at its infancy as policy makers or regulators have yet to decide on the liability of AI. However, the findings also suggested that theories of liabilities such as product liability and strict liability are possible to adduce liability on AI.*

Research limitations - *The research limitation is the scarce amount of literature available*

Originality/value - *This research is novel where AI machines might be liable in the event of negligence.*

Keywords : Artificial Intelligence, Ethical Issues, Moral dilemmas, Negligence, Liability

Legal Implications of Prenatal Diagnosis in Malaysia

Chee Ying Kuek[1]

[1]Faculty Of Law, Multimedia University

Abstract

Background - *Prenatal diagnosis enables detection of any disease or disability of the fetus during the pregnancy of a woman. Parents whose fetus is found to have serious disorder from antenatal testing may terminate the pregnancy or continue with the pregnancy to term. There are possible legal implications for this procedure.*

Purpose - *The purpose of this research is to examine the possible legal implications of prenatal diagnosis in Malaysia.*

Design/methodology/approach - *This study adopts doctrinal legal research in which the researcher examines statutes and decided cases in Malaysia, the United Kingdom (UK) and Singapore relating to abortion, wrongful birth and wrongful life claims. Statutory provisions of the Penal Code, Abortion Act 1967 (UK), Infant Life (Preservation) Act 1929 (UK), Termination of Pregnancy Act (Chapter 324)(Singapore), and case law are analysed to explore the possible legal liabilities of medical practitioners in Malaysia as compared to their counterparts in the UK and Singapore.*

Findings - *In Malaysia, abortion following a prenatal diagnosis is only legally possible if the statutory criteria in the Penal Code are met. Abortion is illegal if it is not done for therapeutic purpose. A wrongful birth action brought by a woman who claims to be deprived of the opportunity to terminate her pregnancy may not be successful in Malaysia, unless it can be proven that a legal abortion could have been performed if not because of the prenatal negligence of the medical practitioner. However, a wrongful life action brought in the child's name for being allowed to be born with disability may not be viable since the claim of being harmed by being born could hardly be established and it is against the public policy.*

Research limitations - *The research is limited by the lack of decided cases in Malaysia in this related field.*

Originality/value - *The research on the legal implications of prenatal diagnosis in Malaysia is relatively scarce and this study can contribute to the body of knowledge on this aspect.*

Keywords : Abortion, prenatal diagnosis, termination of pregnancy, wrongful birth, wrongful life

Electronic Signature and Attestation in Conveyancing Practice: A Malaysian Legal Perspective

HUA SIONG WONG[1]

[1]Multimedia University

Abstract

Background - *The Corona Virus Disease 2019 ('COVID-19') pandemic brought about an unprecedented disruption to the global business activities. Physical face-to-face activities have to be restricted due to movement control order (MCO). The clients are required to sign the documents physically in the presence of the solicitor who will subsequently attests the signature of the clients. The issue arises whether electronic signature and attestation are permissible under the laws of Malaysia.*

Purpose - *The purpose of the research is to study the legality of electronic signature and attestation in conveyancing practice in Malaysia and subsequently to propose recommendations to overcome these issues.*

Design/methodology/approach - *This is qualitative study and not an empirical study and it is via library study from various primary and secondary data sources, including decided cases by the courts in Malaysia, written statutes, publication of journal and article.*

Findings - *The Digital Signatures Act 1997 (DSA) and the Electronic Commerce Act 2006 (ECA) have legalised electronic signatures. The DSA is the law governs the digital signatures in Malaysia. ECA has listed few documents which cannot be signed or executed electronically, namely Power of Attorney, the Wills and codicils, the trusts, and negotiable instruments. However, with regards to the issue of attestation of these documents, there is no clear laws which govern the attestation. The legal issue arises when the lawyers who attested these documents will be liable to be called as witness under the Evidence Act 1950 to testify his or her signature if these documents are tendered as evidence in any court proceedings. Thus, it is suggested that the need for unique legal framework for electronic signature and attestation in Malaysia due to lack of specific laws which govern the issues of electronic signature and attestation.*

Research limitations - *Time constraints and not able to go for fieldwork study and difficult to fix an appointment with targeted interviewers.*

Originality/value - *A new legislation to govern the issue of electronic signature and attestation in Conveyancing Practice.*

Keywords : Attestation, Conveyancing Practice, Electronic Signature, Malaysia.

Internet Addiction among adolescents in Malaysia: Legal Discourses and the Law of Juvenile Delinquency

Manique AE Cooray[1]

[1]1Multimedia University

Abstract

Background - *Recent work conducted explain the three main aspects of the Internet that makes it addictive.They are its affordability, anonymity and convenience. To address the question of whether the Internet could be a cause for juvenile delinquency it is necessary to understand the nature of juvenile delinquency. Kratcoski, and Lucille states, "juvenile delinquency" could refer to any behaviour by those socially defined as "juveniles" that violate the norms set by the controlling group.*

Purpose - *The research proposes to address the question whether the Internet is another cause for juvenile delinquency within the above mentioned legal definition and whether it could be understood with reference to the existing theories on the Law on Delinquency.*

Design/methodology/approach - *The methodology employed is a doctrinal research to analyses the various sociological explanations of juvenile delinquency which includes social strain theories; cultural transmission theory; social learning theories; labeling theories; radical or conflict theories and social control theories.*

Findings - *The findings indicate that a number of delinquency theorists have regarded sociological and psychological factors as contributing in combination to the occurrence of delinquency and that the Internet is a cause for juvenile delinquency.*

Research limitations - *This research proposes that since etiological theories often merge, overlap, and are built upon each other the social control theory would be more suitable to address the issue of Internet addiction as a cause for juvenile delinquency. However, the limitation of the work is such that it on only concentrates on the social control theory.*

Originality/value - *This study proposes that certain issues must be addressed. Firstly, it is necessary to identify the categories of children depicting the most delinquent behaviour, secondly, to study the theories that offer the best explanation of the causes of delinquency, thirdly, to understand what programmes are effective in controlling delinquency and finally to determine the perception of the society towards delinquency. And a more specific legal definition of juvenile delinquency focuses upon the act committed by a youth. As explained by Bynum, and William, delinquency is determined according to the acts committed by those under a specific age and is mainly under those of 18 years of age.*

Keywords : Internet; Children; Family Law; Online safety

Track: Corporate law

Digitalisataion and Corporate Law: The Impact on Shareholders' rights

Yang Chik Adam[1], Norazuan Binti Amiruddin[2], Rebecca Mathan[3]

[1,2,3]Multimedia University

Abstract

Background - *Based to the Malaysian Businesses Report states that 78% of Malaysian businesses are either moderately or extremely affected by the COVID-19 pandemic. Companies are exploring all avenues to mitigate the impact of the pandemic. Companies Act 20016, s 327 states that a company may, subject to there being no express prohibition in its constitution, convene a meeting of members at more than one venue using any technology or method. The company should ensure that (i) the technology or methods utilised enables its members to participate and exercise their right to speak and vote at the meeting; (ii) the main venue of the meeting is in Malaysia; and (iii) the chairperson shall be present at that main venue of the meeting. The question arises as to the shareholders right to information and participation as part of corporate's best practice.*

Purpose - *This research provide solution regarding the law regulating shareholders' meeting as shareholders' meeting is important but relatively at times been neglected as shareholders' involvement in corporate decision making.*

Design/methodology/approach - *The methodology approach is qualitative with respondents from corporate Regulators, public-listed companies, Malaysian Institute of Corporate Governance. Focus group discussions and interviews will also be conducted with these Respondents.*

Findings - *The findings provide solutions to Corporate Regulators and companies in ensuring that proper order and preserving shareholders' rights at the meeting are maintained and they will always be given the opportunity to participate in meetings. This will also enhance best practice for shareholders under the Malaysian Code on Corporate Governance 2017.*

Research limitations - *The limitations are in the difficulties in discussions with Companies directors which involved corporate confidential information.*

Originality/value - *The novelty will provide the shareholders' rights are safeguarded and the positive experiences are gained via the virtual shareholders meeting and indicate an increase in financial performance.*

Keywords : Companies, Shareholders, virtual general meetings

Track: Law and economics

The Unbearable Position of Being: Sexual Harassment at the Workplace

Bahma Sivasubramaniam[1]

[1]Multimedia University

Abstract

Background - *Sexual harassment is a thorny issue globally. A 2019 survey has found that 36% Malaysian women have faced sexual harassment. Another survey conducted by Vase.ai in collaboration with Women's Aid Organisation (WAO) on position of women in the workplace found that the over 70% of women interviewed opined that the sexual harassment is an issue.*

Purpose - *The purpose of this paper is to highlight the weaknesses in employment law in addressing sexual harassment complaints by female employees. Digitalisation has made sexual harassment even more dangerous, as there is no need for the harasser to carry out his or heinous acts physically.*

Design/methodology/approach - *The paper has a doctrinal approach. It will study the existing legal situations relating to sexual harassment at the workplace and a critique of it. A study of the Employment Act 1955 will be embarked.*

Findings - *There is no proper legal protection for the harassed employee. The Code of Practice on the Prevention and Eradication for Sexual Harassment in the Workplace issued in 1999 has its weaknesses, the main one being it is soft law. It serves merely as guidelines to employers and does not have the force of law, thus making it a toothless tiger. It is further argued that whilst the amendments to the Employment Act 1955 in 2012 were admirable, in reality they do not provide the desired protection for the harassed employee. It will examine critically the duties imposed by the Act on the Employer to address complaints of sexual harassment and and appraise whether such duties are effective.*

Research limitations - *The main limitation of this research is that there are no comprehensive previous studies on this aspect. Since this is a doctrinal paper, data is not relevant.*

Originality/value - *The paper will recommend stronger safeguards for the harassed employee and detailed obligations on the Employer to deal with complaints of sexual harassment.*

Keywords : Sexual harassment, workplace harassment, Employment Act 1955 (as amended 2012), protection of victims, duties of employers

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CONFERENCE CHAIR MESSAGE

We are delighted to welcome you to International Conference on Technology and Innovation Management 2021 (ICTIM 2021) by Multimedia University (MMU), Research Synergy Foundation (RSF), and Canadian University, Dubai (CUD) that held virtually on June 21-23, 2021.

The Centre for Knowledge and Innovation Management (CEKIM), Faculty of Management, Multimedia University is set to hold its first conference titled `International Conference on Technology and Innovation Management 2021 (ICTIM 2021)' which carries the theme `Humanizing Innovation'. This conference will bring together academic researchers, industry players, policymakers and civil society leaders to engage and share the latest trends and development in technology and innovation management.

It has been our privilege to convene this conference. Our sincere thanks, to the conference organizing committee; to the Program Chairs for their wise advice and brilliant suggestion on organizing the technical program and to the Program Committee for their through and timely reviewing of the papers. Recognition should go to the Local Organizing Committee members who have all worked extremely hard for the details of important aspects of the conference programs and social activities.

We welcome you to this conference and hope that this year's conference will challenge and inspire you, and result in new knowledge, collaborations, and friendships.

Best regards,

Dr Arnifa Asmawi

ICTIM Conference Chair

CONFERENCE CHAIR

Dr Arnifa Asmawi

Dr Arnifa Asmawi is the Deputy Director of Strategy and Quality Assurance, Multimedia University (MMU). She oversees the implementation of university-level strategies and performance management via Balanced Scorecard. She is also a Senior Lecturer at the Faculty of Management, MMU. She received her B.A (Hons) Industrial Relations and Human Resource Management from the University of Kent, UK. She then completed her Master of Philosophy and PhD from MMU.

Dr Arnifa teaches management subjects (Research Methodology, Human Resource Management, Leadership, and Organizational Behaviour) at the undergraduate and postgraduate level. In addition, she actively supervises Phd, DBA and MPhil students. 31 MBA students have also graduated under her supervision.

Prior to her academic career, she was a strategy analyst at Telekom Research & Development Sdn. Bhd. (TMR&D), the R&D arm of Telekom Malaysia Berhad. In TMR&D, she specialised in strategic HRM and performance management (managing enterprise-level process of Balanced Scorecard and Key Performance Indicators). Her current research interest is on the organizational issues in R&D management such as R&D culture, transformational R&D leadership, high performance work practices (HPWP) and university-industry R&D alliances. She has written and published various articles in international refereed journals and conferences.

KEYNOTE SPEAKER

MOHD ISKANDAR BIN ILLYAS TAN, PhD

Dr Iskandar conducts R&D at the university and transforms the results into successful commercialised products and services. He is very passionate of understanding the industry challenges; and developing innovative solutions to solve them. To be directly involved within the complete commercialisation ecosystem from the university to industry, Dr Iskandar has been working with Universiti Teknologi Malaysia since 1997 and created his own technology start-up company known as HOLISTICS Lab Sdn Bhd in 2015. Apart from conducting research and development, he is also actively engaged with the halal industry domestically and internationally. Through this collaboration, HOLISTICS Lab successfully commercialised several products and services namely:

- Halal Masterclass - http://training.holisticslab.my/
- Halal Technology - http://quikhalal.com/
- Halal eLearning - https://hacademy.my/
- Halal Consultation - http://holisticslab.my/

In UTM, Dr Iskandar is a subject-matter expert on New Venture Creation, Commercialization for Innovation, Technopreneurship, Business Modelling, Information Systems, Database and many more.

Ms. Yew Jian Li

Envisioning a world where knowledge, action and capital complement, Jian dedicates her career to the impact sector. She is the Managing Director of Citrine Capital, a profit with purpose investment company, and co-founder of Social Innovation Movement, a think tank that focuses on research impact and community development. She is also an Associate Practitioner of Social Value International and a Global Reporting Initiative professional. Previously, Jian was involved in several impact-orientated institutions, including non-profit entities, social enterprises and research centres. Her Masters' Degree is in International Development at King's College London, United Kingdom, and her Bachelors' Degree is in Biochemistry at the University of Melbourne, Australia.

SESSION CHAIRS

Dr. Andry Alamsyah

Andry Alamsyah is a researcher/data scientist, a faculty member at the School of Economics and Business - Telkom University, the head of Social Computing and Big Data (SCBD) Lab. - Telkom University, and also the Chairman of Indonesian Data Scientist Society (AIDI). He was Director of Digital Business Ecosystem Research Center, Telkom University from 2018 - 2020. His research interest encompasses three major latest technological advancements: Big Data, Artificial Intelligent, and Blockchain Technology. With his SCBD Lab, he focuses on the study of quantification of human/social behavior using their digital trace on the internet. He holds a Ph.D. degree from STEI-ITB - Indonesia in Social Network and Big Data topics, Magister of Informatics from Universite Picardie Jules Verne - France, and a Bachelor from Mathematics ITB. He has been involved in several Big Data and Data Analytics projects in Telkom Indonesia, Telkomsel, Ministry of Finance, Ministry of Foreign Affairs, Ministry of ICT, Bank Indonesia, OJK, and many more.

Assoc. Prof. Rovena I. Dellova, DEM

Dr. Wheng Dellova is a licensed teaching professional who is eager to provide education based on real-life examples and innovative learning styles. She is a Fulltime Faculty handling tourism and hospitality subjects at Lyceum of the Philippines University, Manila.

She is a graduate of Doctor in Education Management at Polytechnic University of the Philippines. She handled the Practicum placement for hospitality programs for eight (8) years in LPU and served as Operations Head at Palm Group of Hotels School for three (3) years, where she is hands-on in the placement of Interns. She also joined various food industry and businesses prior engaging in the teaching profession. Her Research endeavour covers education, management and hospitality topics.

Dr. Sheryl H. Ramirez

Dr. Sheryl H. Ramirez is a Registered Nurse and a Licensed Professional Teacher from the Philippines with advanced degrees in Nursing from the University of the Philippines and a Ph. D in Educational Policy and Administration. Her career evolved from clinical practice as an ICU Nurse with US RN recognition as a 'Magnet Nurse' by the American Nurses Credentialing Center to teaching practice as Nursing Faculty and Professor at the Graduate School of Education at Universidad De Manila where she is currently the Research Director.

Her research areas of interest are innovative pedagogy, resilience, and transformation across health and education to respond to the global pandemic challenges. A researcher, a research collaborator, and a reviewer of the International Journal of Africa Nursing Sciences published by Elsevier with previous works on Emotional Quotient and Leadership; Organizational Climate, Organizational Learning, and Research Efficacy of Teachers.

Dr. Sita Deliyana Firmialy

Sita is a professional lecturer from Telkom University in Indonesia. Her research and teaching area of expertise are mainly focused on the Risk Management field, Sustainability Risk, Entrepreneurial Finance, Business Ethics in Finance, Education Economics, Financial Technology and Housing in Finance. Sita has been involved with several academic collaborations projects as well as communities engagement program focused on the development of communities with several private companies and Government Institution in Indonesia, especially in relate to the topic of SDGs. Before join the Telkom University, Sita is a part of faculty member in Institut Teknologi Bandung for over six-years, with focused of expertise lies mainly on the multi-disciplinary topics in finance. Sita has published quite a number of academics journals as well as attended quite numerous number of international conferences and she has also been quite active as reviewers for several international conferences and international academic journals.

Prior to the academic world, Sita served as professional practitioners in the Banking and Insurance industry for more than eight years. Her industry expertise mostly focused on the areas of banking services specialist, credit management, financial investment specialist, banking management, and insurance and bancassurance specialist.

Dr. Joycelyn Dayrit

Dr. Joycelyn Sicat- Dayrit is experienced in Education and Corporate Consultancy with a demonstrated history of working in the education management industry. She has a Bachelor of Science in Commerce (BSC) major in Business Administration degree from the University of Santo Tomas and Post graduate degrees at Angeles University Foundation, she is currently taking her second Doctorate at the University of the Visayas Philippines.

She is a currently a Guest Lecturer at the Graduate school of Business of Holy Angel University, Northwestern University and University of the Visayas. Programme Consultant of Families for Tomorrow Service and Business development consultant of F Mag Singapore, Project Consultant of Global Professional Advancement, Philippines.

She is an Accredited Reviewer for Junior Achievement Philippines for RMP and RBP and is a Member of the Regional Quality Assessment Team (RQAT) of the Commission on Higher Education Region 3. She is the corporate secretary of Pampanga Research Organization (PREO), blind Peer Reviewer of 5 international 3 local journals. Dr. Dayrit considers herself a neophyte in the field of Research, thus she continues to upskill. Her paper on Work Life Balance and Employee Engagement received a best paper/ presentation award and was published thereafter in a Scopus indexed journal.

Dr. Mageswari Ranjanthran

Prior to joining the education industry in 2009, Dr Mageswari's work experience involved mainly corporate marketing for events and Meetings, Incentives, Conferencing, Exhibitions (MICE). She is a full breed of University Science Malaysia. Her bachelor's degree was in communication, where she majored in persuasive communication and minored in management, whereas her master's degree was in Tourism Development. Her PhD dissertation was titled "The Effects of Environmental Quality on Revisit Intention among European Tourists to Malaysia". She was involved as a consultant for several tourism projects. Her research interest focuses on repurchase intention, tourism marketing, holistic well-being, healthy ageing and small-scale sport tourism

Dr. Prameshwara Anggahegari

Wara, as Prameshwara Anggahegari is known, is a lecturer in the School of Business and Management. She holds her Doctoral of Philosophy from Institut Teknologi Bandung, Indonesia. She teaches courses in social entrepreneurship, community project management, corporate social responsibility, and environmental management systems, all of which are closely related to her research interests in triple bottom line and blended values. She is also the Community Engagement Specialist at teras Hijau Project, an empowerment movement located in Indonesia. This movement attempts to decrease food insecurity in Bandung by promoting urban farming, which is driven by low-income housewives living in high-density areas. She also participates in numerous government initiatives as a member of the Social Expert Team. Under the Research Synergy Foundation, Wara is also the director of Reviewer Track, a hub for empowering other academicians and reviewers all around the world. Her current interest is about gender, social entrepreneurship and empowerment.

Ms. Amelynn B. Corpuz

Ms. Amelynn B. Corpuz is a candidate for the degree of Doctor of Philosophy in Management at Saint Louis University in Baguio City under the CHED Graduate Studies K12 Transition Program Scholarship. She is currently working on her dissertation which examines extended producer responsibility and circular economy among MSMEs in Pampanga. She also completed her Master's in Business Administration at Angeles University Foundation with research work on green marketing and green economy. Her undergraduate preparation is also on Business Administration major in Marketing Management taken at Saint Louis University, Baguio City. Prior to her stint in the academe, she was an HR team leader in a Korean company in Clark Freeport Zone. Presently, she is teaching subjects on human resource management, economics, marketing subjects, and. Her research is focused on green innovation in business and sustainability.

Ts. Dr. Magiswary Dorasamy

Dr. Magis received her PhD from Multimedia University, Malaysia in the year 2013 under the supervision of Prof. Dr. Murali Raman, MMU. Her PhD research was in the area of Information Systems for Disaster Management. Currently, she is a Deputy Dean (Research and Innovation), a Senior Lecturer in the Faculty of Management. To date, she has had a distinguished corporate career and academia career spanning over 23 years. She has also obtained several national research grants, awards, and copyrights in the area of information systems for disaster management, knowledge management systems and has published extensively in international journals and conference proceedings.

She is also a member of Association of Information Systems (AIS), Malaysian Association of Information Systems (Life Member), Qualitative Research Association of Malaysia (QRAM - Life member) and Association for Information Systems for Crisis Response and Management (ISCRAM). She is also known for her NVivo analytical software hands-on training, action research, and qualitative research method. Thus far, she has written 2 books on an easy guide to use NVivo. Her specific area of expertise is Management Information System (MIS) especially on IS success factors, adoption of technology, knowledge management systems, IT and disaster management, cybersecurity, IR4.0 education eco-system, and IT innovation. iCEMAS, an integrated community emergency management, and awareness system, a prototype developed as one of her PhD output was selected as top 10 finalists in National Innovation Award 2013 (Malaysia) for service category, and top 3 finalists at the APICTA Award 2015 for Best e-Government Solution category. In the year 2019, along with Prof Murali Raman, she won the best Knowledge Management and Intellectual Capital Excellence Award at the 20th European Knowledge Management Conference in Lisbon, Portugal. She also received Highly commended Finalist for National Outstanding Educator Award 2019 from Private Education Cooperative of Malaysia.

Dyah Nirmala Arum Janie

Dr Dyah Nirmala Arum Janie is the Director of Scientific Publication in Semarang University Indonesia since 2018 and a member of the RSF Scientific Board since 2019. She received her PhD in 2014 from Diponegoro University, Indonesia. Three words that describe her are inquisitive, philomath and polymath. Despite her challenging daily routines as a mother of four children, she has been involved in various research in accounting, e-commerce, SMEs, computer and information system, finance, and social/organizational psychology. She holds several publications, such as in the Humanities & Social Sciences Reviews, International Journal of Multidisciplinary Research, and Economics & Business Solutions Journal. She is very open to research opportunities from other fellow researchers and is currently seeking research partners globally.

Dr. Yeo Sook Fern

Dr Yeo Sook Fern is a Lecturer at the Faculty of Business, Multimedia University, Melaka. She is currently holding the position as of the Deputy Dean for Research & Industrial Collaborations. She commenced her career as a lecturer, with 19 years of teaching experience. She teaches marketing for bachelor degree programmes as well as Master degree. She supervises BBA, MBA and PhD students. Apart from teaching, she is also active in research.

She has secured international, national and university grants both as the principal researcher and project members for several researches. She has published 36 internationally refereed conference papers, 57 journal articles and 2 book chapters. Apart from her impressive list of published research work in international refereed journals, Dr. Sook Fern has also won many awards throughout her academic and career journey.

Dr Sook Fern can be contacted at: yeo.sook.fern@mmu.edu.my

CONFERENCE PROGRAM

Day 1, Monday, June 21st, 2021

Time (UTC+8)			*Dur'*	*Activity*
ICTIM Room 1				https://us02web.zoom.us/j/81920531612?pwd=dUhlQmJEbEJOUERyVXI0V29kRzV0UT09 Meeting ID: 819 2053 1612 Password: DIFCON2021
14:00	-	14:05	0:05	**MC Welcoming**
14:05	-	14:45	0:40	KEYNOTE 1: SPEAKER: MOHD ISKANDAR BIN ILLYAS TAN, PHD TOPIC: ACADEMIC ENTREPRENEUR: MYTH AND REALITY
14:45	-	15:25	0:40	KEYNOTE 2: SPEAKER: MS. YEW JIAN LI TOPIC: SOCIAL INNOVATION THROUGH RESEARCH IMPACT
15:25	-	15:40	0:15	Break
15:40	-	16:25	0:45	**Networking Session**
16:25	-			Break & Announcement to go to Main Room at 16.30

Day 2, Tuesday, June 22nd, 2021

Time (UTC+8)	Dur'	Activity
ICTIM Room 1		https://us02web.zoom.us/j/83484272325?pwd=WmNDQ25relJjVmtwZFRhOWVYanQwdz09 Meeting ID: 834 8427 2325 Password: DIFCON2021
9:30 - 9:40	0:10	**MC Welcoming**
9:40 - 9:45	0:05	Session Chair Introduction
9:45 - 12:45	3:00	**Presentation Session 12 person** 15 minutes/presenter
12:45 - 12:55	0:10	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
12:55 - 13:10	0:15	**Break**
13:10 - 13:15	0:05	Session Chair Introduction
13:15 - 16:15	3:00	**Presentation Session 12 person** 15 minutes/presenter
16:15 - 16:25	0:10	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
16:25 -		Break & Announcement to go to Main Room at 16.30

Day 3, Tuesday, June 23rd, 2021

Time (UTC+8)	*Dur'*	*Activity*
ICTIM Room 1 & 2		***ICTIM Room 1** https://us02web.zoom.us/j/85281503681?pwd=cVB0R0xXakNMQXFFL29WZVlrT2phQT09 Meeting ID: 852 8150 3681 Password: DIFCON2021 ***ICTIM Room 2** https://us02web.zoom.us/j/89336128611?pwd=MGpCVzdvTUhJQ1ZkbGw3MzBMVlpjdz09 Meeting ID: 893 3612 8611 Password: DIFCON2021
9:30 - 9:40	0:10	**MC Welcoming**
9:40 - 9:45	0:05	Session Chair Introduction
9:45 - 12:45	3:00	**Presentation Session 12 person** 15 minutes/presenter
12:45 - 12:55	0:10	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
12:55 - 13:10	0:15	**Break**
13:10 - 13:15	0:05	Session Chair Introduction
13:15 - 16:15	3:00	**Presentation Session 12 person** 15 minutes/presenter

Time (UTC+8)			Dur'	Activity
16:15	-	16:25	0:10	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
16:25	-			Break & Announcement to go to Main Room at 16.30

Day 2: Tuesday - June 22, 2021

ICTIM - Room 1

https://us02web.zoom.us/j/81920531612?pwd=dUhlQmJEbEJOUERyVXI0V29kRzV0UT09
Meeting ID: 819 2053 1612
Password: DIFCON2021

Session 1: 09.45 - 12.45 (UTC+8)

Session Chair: Dr. Andry Alamsyah & Dr. Rovena I. Dellova

Track Data Analytic

Paper ID	Presenter	Paper Title
TIM21112	Rathimala Kannan	Customized Economic Stimulus Package Recommender System to Cushion the COVID-19 Impact
TIM21154	Manar Abushosheh	Do the COVID-19 Vaccines Boost Market Efficiency? The Case of the US and the UK

Track Entrepreneurial Economics

Paper ID	Presenter	Paper Title
TIM21115	Tan Sin Yin	Online Food Delivery Services: Consumers' Perceptions and Attitude During and Post COVID-19
TIM21117	Nahariah Jaffar	Data Analytics Competencies and Religiosity Influences on External Auditors' Performance in Malaysia

TIM21118	Kamarulzaman Ab. Aziz	Social Entrepreneurship for Community Development: Ensuring the Ummah's Well-being
TIM21160	Noor Shahaliza Othman	Measuring the Motives of Informal Entrepreneurs in Malaysia
TIM21137	Davide Contu	COVID-19 Pandemic and Volatility in Merging Stock Markets: The Case of GCC Countries
TIM21142	Nurbani Md Hassan	Micro-Franchise Business Models in Malaysia : A Franchisees Perspective
TIM21162	Noor Shahaliza Othman	Social Entrepreneurship Intention among Undergraduate Students
TIM21152	Oluwayomi Toyin Ojo	Can Frugal Innovation be a Game-Changer for Academic Entrepreneurial Engagement to Create Sustainable Education Eco- System? A Research Gap Analysis
TIM21165	Nurbani Md Hassan	Mobile Entrepreneur Programme by Zakat Institution: A Proven Programme for Poverty Eradication
TIM21172	Yee Wan Lee	Can Synchronous TL during MCO Sustain Student Engagement, and Interest

Day 2: Tuesday - June 22, 2021

ICTIM - Room 1

https://us02web.zoom.us/j/83484272325?pwd=WmNDQ25relJjVmtwZFRhOWVYanQwdz09
Meeting ID: 834 8427 2325
Password: DIFCON2021

Session 2 : 13.15 – 16.15 (UTC+8)

Session Chair: Dr. Sheryl H. Ramirez & Dr. Sita Deliyana Firmialy

Track Human Resources Management

Paper ID	Presenter	Paper Title
TIM21102	Tan Xin Yee	HR Practices and Turnover Intention: The Mediating Role of Organizational Commitment
TIM21104	Venny, Sin-Woon Chong	Human Capital on Mutual Fund Performance and Characteristics in Malaysia
TIM21106	Yeow Jian Ai	Work-from-Home: Workplace Ergonomics Problems and Solutions
TIM21140	Darshana Darmalinggam	Proactive Measures to Eradicate Poverty in Malaysia: A Shared Prosperity Vision.
TIM21175	Nur Muzdalifah Mohd Mudzar	Skill Shift of the Workforce in the Fourth Industrial Revolution

Track Information System

Paper ID	Presenter	Paper Title
TIM21156	Rathimala Kannan	Bank Employees' Satisfaction with Anti Money Laundering System

Track Knowledge and Innovation

Paper ID	Presenter	Paper Title
TIM21129	Jayamalathi A/p Jayabalan	Forecasting Private Higher Education Institutions Sustainability Through Frugal Innovation
TIM21150	Wei Ling Kwan	Digital Taxation to Promote Frugal Innovationin IHL: Research Gap
TIM21127	Tung Soon Seng	Knowledge Creation for Digital Innovation: Systematic Literature Review
TIM21138	Junainah Mahdee	Green Campus University: Problems and Prospects
TIM21168	Kalaivani A/p Jayaraman	Environmental Management System and Organisational Performance in Malaysian Manufacturing Industries: Mediating Role of Green Innovation

Track Knowledge Management

Paper ID	Presenter	Paper Title
TIM21164	Aznur Hajar Abdullah	Asian Culture in Online PBL: Revisiting Old Assumptions?
TIM21167	Thein Oak Kyaw Zaw	The Necessity of Real Contact Tracing Rather Than Proximity Tracing in Combating Human-to-Human COVID-19 Infection – A Systemic Study

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Session 1: 09.45 - 12.45 (UTC+8)

Session Chair: Dr. Joycelyn Dayrit & Dr. Mageswari Ranjanthran

Track Organizational Studies

Paper ID	Presenter	Paper Title
TIM21143	Kok Wai Chew	Antecedents and Outcomes of Strategic Decision Making Processes in a High Velocity Environment: A Conceptual Framework
TIM21153	Arasu Thangaveloo	Confidence in Cooperative Corporations: A Systematic Literature Review
TIM21157	Shamima Raihan Manzoor	Investigating the Impact of University Image on International Students' Participation Behaviour

Track Project Management

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TIM21119	Jamaludin Jupir	An Exploratory Study on the Determinants of Successful Collaborative Project Management in the Construction Industry
TIM21163	Nor Hazleza Mohamad	Social Learning through University Social Responsibility Programme

Track Social Innovation

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TIM21116	Abdullah Sallehhuddin Abdullah Salim	Corporate Social Responsibility and the Impact on Dividend Payout among Malaysia Financial Institutions
TIM21120	Sharmini Gopinathan	Curbing Mental Health Issues among Malaysian Youth using Mind Reframing Techniques
TIM21131	Ezatul Faizura Mustaffa Kamal	Humanizing Smart City for Improved Performance
TIM21133	Lai Ming Ming	Determinants of Age-Friendly Environment for Social Connectedness
TIM21136	Junainah Mahdee	Expanding Foodbank Impact on Food Security
TIM21135	Lai Ming Ming	Assessing Retirement Resources and Subjective Well-Being of Retirees in Malaysia
TIM21151	Noor Ashikin Mohd Rom	Mental Illness Due to Extreme Poverty: A Case Study

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Session 2: 13.15 - 16.15 (UTC+8)

Session Chair: Dr. Prameshwara Anggahegari & Ms. Amelynn B. Corpuz

Track Social Innovation

Paper ID	Presenter	Paper Title
TIM21145	Noor Ashikin Mohd Rom	Desired Support System to Eradicate Vagrancy
TIM21161	Noor Shahaliza Othman	Determinants of Agricultural Development in Malaysia

Track Technology and Innovation Management

Paper ID	Presenter	Paper Title
TIM21148	Qingnan Li	Improved Back Test of Magic Formula in Malaysian Stock Market using Applied Programming and Online Quantitative Platform
TIM21101	Kar Hoong Chan	Is Generation Z Ready for Digital Revolution? A PLS-SEM Analysis

TIM21103	Saravanan Muthaiyah	Task Delegation and Risk Ordering Relation for Autonomous Banking
TIM21114	Nabilah Kamaruzaman	Development of Alliance Capabilities Measures in University-Industry R&D

Track Social Network Analysis

Paper ID	Presenter	Paper Title
TIM21159	Aznur Hajar Abdullah	Social Media Supporting Business Experts' Thinking and Reasoning with Future Graduates

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Meeting ID: 893 3612 8611
Password: DIFCON2021

Session 1: 09.45 - 12.45 (UTC+8)

Session Chair: Ts. Dr. Magiswary Dorasamy & Dr. Dyah Nirmala Arum Janie

Track Technology and Innovation Management

Paper ID	Presenter	Paper Title
TIM21108	Lan Thi Phuong Nguyen	Preliminary Study on the Awareness of P2P Lending Platforms in Malaysia
TIM21123	Jeen Wei Ong	Technology Adoption Journey Map for Facilitating Mass Adoption of Agriculture Technology
TIM21110	Arnifa Asmawi	High Performance Work Practices in R&d Organizations: Myth or Reality
TIM21121	Sharmini Gopinathan	Enhancing Innovative Delivery in Schools using Design Thinking
TIM21122	Jeen Wei Ong	The Effect of Green Value Chain on Company's Performance
TIM21109	Lan Thi Phuong Nguyen	P2P Lending Platforms in Malaysia: Opportunity or Risk
TIM21130	Mohammad Nurul Hassan Reza	The Implications of Industry 4.0 on Supply Chains Amid the Covid 19 Pandemic–A Systematic Literature Review

TIM21173	Dr. Junainah Mahdee	Search Engine Optimization (SEO) Strategy as Determinants to Enhance the Online Brand Positioning
TIM21132	Thai Siew Bee	An Examination of Factors That Affect the Adoption of E-Wallet in Malaysia
TIM21134	Lai Ming Ming	The Role of Technology Readiness and UTAUT2 in E-Wallet Adoption in an Emerging Asian Economy
TIM21139	Mo'men Awad Al Tarawneh	Factors Affecting the Adoption and Usage of Mobile Banking among Generation Y Consumers in Malaysia

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ICTIM - Room 2

https://us02web.zoom.us/j/89336128611?pwd=MGpCVzdvTUhJQ1ZkbGw3MzBMVlpjdz09
Meeting ID: 893 3612 8611 - Password: DIFCON2021

Session 2: 13.15 - 16.15 (UTC+8)

Session Chair: Dr. Yeo Sook Fern

Track Technology and Innovation Management

Paper ID	Presenter	Paper Title
TIM21141	Anushia Chelvarayan	Cashless Transactions: A Study on E-Wallet Acceptance among University Students
TIM21144	Sharbani Bin Harun	Enterprise Resource Planning (ERP) Implementation on Organizational Performance: Case Study of a Science and Technology Park (STP) Organization in Malaysia
TIM21147	Chinnasamy Agamudainambhi Malarvizhi	Efficiency Improvement in IoT Use for Elderly NCD Patients in Malaysia: Extending the Practical Implementation of Theory of Planned Behaviour
TIM21149	Hazlaili Hashim	Factors Influencing the Usage of E-Wallet among Students in Malaysia
TIM21155	Junainah Mahdee	Stakeholders' Readiness in the Development of an Islamic Smart City
TIM21158	Saravanan Muthaiyah	Fintech What Should be Taught Really?
TIM21126	Siti Kuni Taibah Imam Syafii	Prediction of Emergency Triage System on Machine Learning using Emergency Severity Index (ESI)

Track: Entrepreneurial Economics

Online Food Delivery Services: Consumers' Perceptions and Attitude During and Post Covid-19

Tan Sin Yin[1], Lim Su Yin[2]

[1,2]Multimedia University

Abstract

Background - *Due to the Covid-19 pandemic, consumers are more inclined to have food ordered online and delivered to their doorstep. Many eateries are forced to provide OFDS to sustain their business. Unsurprisingly, the OFDS industry accelerated rapidly in these 2 years but will consumers continue to use it even after the pandemic?*

Purpose - *From literature review, most researchers studied consumers' behaviour towards OFDS with the aid of technology. However, limited work was done towards continuance intention after the pandemic. Hence, this study aims to investigate consumers' perceptions such as the motivation of Perceived Ease of Use (PEOU), Time Saving Orientation (TSO), Price Saving Orientation (PSO) and Convenience Motivation (CM) that influence their attitude towards continuingly using OFDS after Covid-19, which are the crucial factors in supporting OFDS industry in future.*

Design/methodology/approach - *To reduce Covid-19 transmission, non-probability sampling method is applied to observe consumers' perceptions and attitude towards OFDS. An empirical analysis was carried out based on demographic background in tabulation form with graphical presentation. Then, a comparative analysis among the consumers' perceptions and attitude was conducted to reveal the significant factors that affected the continuance intention after this pandemic. Eventually, appropriate statistical tests were applied to ensure result reliability.*

Findings - *The study revealed that PEOU is not the main contributor towards CI as most consumers already have prior online purchase experience. However, TSO has a positive correlation with PEOU as online food ordering is literally easy with just a click away. PSO is also associated with TSO, especially when consumers can compare price on the website or ordering platform. PEOU, TSO, PSO and CM positively influence consumers' intention to continue using OFDS even after Covid-19.*

Research limitations - *The engagement of consumers in rural areas is limited due to poor internet coverage and out of delivery range. The urban tech-savvy young adults are more responsive. Future study may focus on specific areas and ethnicities for more detailed findings.*

Originality/value - *Several studies were done on investigating consumers' behaviour towards OFDS before and during Covid-19 but the novelty of continuance intention in using OFDS after the pandemic provides a valuable prospect for food merchants to retain customers.*

Keywords : Online Food Delivery Services, Continuance Intention, Perception, Attitude

Data Analytics Competencies and Religiosity Influences on External Auditors' Performance in Malaysia

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[1,2]Multimedia University, [3]University Of Malaya

Abstract

Background - *In auditing, data analytics tools can be used to support the external auditors' judgements. While data analytics may enhance audit quality, however, little is known about the external auditors' data analytics competencies, particularly in Malaysia. In addition, role of religiosity in enhancing the external auditors' performance within the context of data analytics competencies is also not adequately investigated in the auditing literature.*

Purpose - *The aim of this study is twofold. Firstly, it attempts to investigate the effect of data analytics competencies on the external auditors' performance. Secondly, it examines the moderating effect of religiosity on the relationship between data analytics competencies and external auditors' performance.*

Design/methodology/approach - *Survey was conducted on 201 external auditors. Questionnaire was developed based on data analytics competencies, religiosity and external auditors' performance literature. Pilot test was conducted to 50 respondents whom were drawn from the sample. Four dimensions of data analytics competencies, that were personal capabilities, professional expertise, technical skills, technologies and tools expertise, were examined. Religiosity was measured by level and dimension. The dimensions of religiosity were faith, virtue and optional.*

Findings - *Data analytics competencies (in terms of personal capabilities) is significantly positively affect the muslim external auditors' performance. However, none of the data analytics competencies dimensions affect the performance of non-muslim external auditors. Level of religiosity has significant moderating effect on the relationship between data analytics competencies (in terms of technologies and tools expertise) and muslim external auditors' performance. For the non-muslim external auditors, however, the level of religiosity does not moderate the relationship between data analytics competencies and their performance. Religiosity (in terms of virtue) has significant moderating effect on the relationship between data analytics competencies (in terms of personal capabilities) and muslim external auditors' performance. Meanwhile, reliogisity (in terms of faith) has significant moderating effect on the relationship between data analytics competencies (in terms of technologies and tools expertise) and non-muslim external auditors' performance.*

Research limitations - *Data analytics is a new concept in auditing, therefore, a few respondents may not be familiar with a few of the questionnaire terms.*

Originality/value - *This study demonstrates the need for audit professionals to address the emerging challenge of data analytics.*

Keywords : Data analytics competencies, religiosity, external auditors, performance, Malaysia

Social Entrepreneurship for Community Development: Ensuring the Ummah's Well-being

Kamarulzaman Ab. Aziz[1]

[1]Multimedia University

Abstract

Background - *Studies have recognised the need for further enhancements in the Malaysian community development approaches. The good from community development initiatives may become undone due to disruptions that occur due to various hazards, natural or man made. Severity of the impacts from the hazards can be significant and protracted. Arguably the community development agenda in Malaysia may not only need enhancements but diversification beyond subsidy and charity. Through effective community development initiatives, community members can become more empowered, such that they can increasingly recognise and challenge conditions and structures which are leading to their disempowerment or negatively impacting their wellbeing. This is definitely has become more pertinent given the world is currently gripped by the Covid-19 pandemic.*

Purpose - *The purpose of the research, is to review the common strategies in addressing community development agenda and specifically to review the current landscape of community development in Malaysia with emphasis on those targeted for the Muslim community (Ummah). Then, emerging alternatives for community development initiatives will be reviewed for recommendation and implementation.*

Design/methodology/approach - *The paper employ the systematic literature review methodology as the main research design.*

Findings - *It is proposed that Social Entrepreneurship (SE) has the potential to be a viable alternative solution for addressing community development needs that is beyond government subsidies and incentives. SE may allow for higher levels of engagement and ownership amongst the communities for their own development which may lead to resilience.*

Research limitations - *The limitations arise from the hypothetical nature of the propositions which need further practical testing.*

Originality/value - *The paper will propose a conceptual framework suitable for studies to promote community development agenda via social entrepreneurship by the Muslim community. It is envisioned that the ultimate findings from the studies will be the foundations for effective policy measures empowering the Ummah through sustainable social entrepreneurs and enterprises.*

Keywords : Social Entrepreneurship, Community Development, Well-being, Ummah

COVID-19 Pandemic and Volatility in Merging Stock Markets: The Case of GCC Countries

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Abstract

Background - *The external shocks caused by the COVID-19 pandemic coupled with the sharp decline in oil prices had an intense effect on the volatility of the stock markets of the GCC countries. The shocks increased volatility and risk that led to a huge sell off of stocks. This event provides the opportunity to investigate stock market integration within GCC and between GCC and other countries, for which limited research is available.*

Purpose - *This research assesses the overall trends and volatility of the GCC markets caused by both COVID-19 and the substantial decline in oil price. Moreover, it compares its intensity to the US market's volatility. The paper also examines whether and when the GCC markets volatility has returned to its pre-crisis level.*

Design/methodology/approach - *This study considers stock market data from the following indexes, for the whole 2020: DFM for Dubai, ADX for Abu Dhabi, Bahrain All share for Bahrain, MSM 30 for Oman, FTSE NASDAQ 15 Kuwait for Kuwait, QE all share for Qatar, Tadawul All share for Saudi Arabia, and S&P500 for US. Across these markets, we measured and compared market volatility, which is measured using the standard deviations of daily stock market returns.*

Findings - *Results indicate that the volatility of the GCC stock markets was higher compared to the US market volatility. Moreover, the findings suggest that volatility of the markets of Saudi Arabia, the UAE, and Qatar has returned to their pre-crisis levels in July 2020.*

Research limitations - *This research focuses on the assessment of changes in volatility in GCC stock markets, and in comparison with the US market; however, the study of the determinants of volatility for these markets is left for future research.*

Originality/value - *While research has been conducted around sudden surge in volatility in emerging stock markets, scant is the availability of studies that assess how the coronavirus pandemic impacted stock market volatility in the GCC countries, and whether the impacts are aligned with those experienced by the US markets. This study aims to bridge this gap.*

Keywords : COVID-19 pandemic; Oil price fluctuations; GCC emerging stock markets

Micro-Franchise Business Models in Malaysia : A Franchisees Perspective

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[1,2,3]Multimedia University, Cyberjaya

Abstract

Background - *Micro franchise is a business model that applies to small or micro businesses and can be in various forms or formats. There are various micro franchise business models adopted by the micro businesses all over the world and the adoption of the model creates advantages to the business. However, the micro franchise model adopted and preferred by the micro businesses were hardly discussed and explored. In exploring the above issue, this study aimed to investigate the micro-franchise business formats in the business model adopted by small or micro businesses in Malaysia, particularly in the State of Selangor.*

Purpose - *The purpose of the research is to provide an insight on the most prevalent micro franchise business model embraced by the small and micro businesses.*

Design/methodology/approach - *The exploratory case study method was used in this research because the micro franchise industry is yet to be fully explored, especially in Malaysia. A semi-structured interview guide was used to collect the date from 15 research participants involved in micro franchise business. Content analysis was used to analyze the interview transcripts, which resulted in generating coding and themes for the research*

Findings - *The micro franchise business model adopted was a business format franchise with some modifications on the business scales. In addition, it was also discovered that few of the business owners adopted a simple franchise business format which allows them to only invest in the initial capital in exchange for equipment and recipes for the product, with no other obligation to the franchisor.*

Research limitations - *This research is limited to one geographical area, which is State of Selangor and does not apply to any other States in Malaysia.*

Originality/value - *This research focuses on micro franchise business model which has received little attention and has yet to be fully explored, particularly of the type of business format used in the model.*

Keywords : business model, franchise, format, micro franchise

Can Frugal Innovation be a Game-Changer for Academic Entrepreneurial Engagement to Create Sustainable Education Eco-System? A Research Gap Analysis

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Abstract

Background - *Institution of higher learnings (IHLs) are faced with challenges associated with dwindling resource, rising operating cost, pressure to increase global ranking, outbreak of Covid-19 pandemic, drop in students' enrolment, and need to contribute to the economy and social development. Therefore, academics are expected to go beyond their traditional job responsibilities of research, administrative tasks, and teaching activities and to engage in entrepreneurial activities (EA). Through their engagement in EA, the IHLs can enhance frugal Innovation (FI).*

Purpose - *Little is known on how academic engagement in EA contribute to frugal innovation. Accordingly, this study investigates the determinants of academic entrepreneurial engagement (AEE) and the effects of their engagement archieve frugal innovation through a systematic literature review.*

Design/methodology/approach - *This study integrates literature on (AEE) for FI within the last twenty years from major international databases, particularly concerning in pre-selected keywords, inclusion and exclusion criteria, extraction process and themes identification based on Transfield's five phases strategy is adopted.*

Findings - *We highlight the limited emphasis on AEE for FI, and discusses the role of academic entrepreneurial engagement for FI to facilitate IR 4.0 education eco-systems. The expected findings will enable IHLs prioritise the factors essential to supporting academic entrepreneurial behaviour, thereby enhancing their FI by doing more with less. We believe that the findings warrant the attention of the research community.*

Research limitations - *The study is limited to major indexed journals and conference proceedings. Other documents such as dissertations and books are not included in our search.*

Originality/value - *This study advances the literature on the interplay between AEE, FI and IR 4.0 education eco-systems. The contribution of this paper is the review that will serve as an insight on academic entrepreneurial engagement for FI.* *Acknowledgement: We thank the Malaysian Ministry of Education for awarding a Fundamental Research Grant Fund (FRGS/1/2020/SS02/MMU/02/3) to conduct this research. The findings shared in this paper is part of this project.*

Keywords : academic entrepreneurial engagement, frugal innovation, institution of higher learnings

Measuring the Motives of Informal Entrepreneurs in Malaysia

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Abstract

Background - *Handling the non-observed activities poses major challenges to the governments and other stakeholders. Non-observed activities refer to underground activities, illegal activities, informal sector and any other activities which outcome in goods or services where can be consumed by the household. From these non-observed activities, the impact shows that the volume of people who are involved in informal sector will rapidly increase. Informal economy activities are technically illegal yet are not "antisocial in intent" thereby remaining acceptable to many individuals within society.*

Purpose - *The purpose of the research are to identify the factors leading to entrepreneurial necessity and opportunity and to access the relationship between the factors and engagement while refinement mediates.*

Design/methodology/approach - *To accomplish the purpose of this research, a total of 100 questionnaires were distributed to a people who are employed as informal entrepreneurs in Klang Valley areas by using convenient and proportionate sampling techniques. The data was analyze using SPSS software.*

Findings - *Two major factors leading to informal entrepreneurial activities are necessity and opportunity. Necessity driven can be expressed by cannot find a formal job. For opportunity driven can be expressed by they want to work independently. The refinement are mediates between necessity and engagement. Many times necessity and opportunity may not lead to successful entrepreneurship; it requires further refinement in terms of exploring market potential, technology usage, location preferences and capital requirement. The better refinement leads to better engagement in entrepreneurship.*

Research limitations - *The coverage of respondents can be in broader size in order to get better perspective to cover the Malaysia's population. Ample time is needed to ensure the data collection can be tarely done.*

Originality/value - *The outcome of the research will give a clear picture of why people choose informal entrepreneurship and how they get engaged with it in the long run. This outcome will be useful to the Government while framing policies on entrepreneurship.*

Keywords : necessity driven, opportunity driven, motives, informal entrepreneur

Social Entrepreneurship Intention among Undergraduate Students

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Abstract

Background - *Social entrepreneurship has become a global phenomenon and has captured the attention of parties including policymakers, businesses, civil society groups, academics as well as financial institutions. Social entrepreneurs in social enterprises provide innovative or exceptional leadership that treats complex social problems while at the same time has the ability to create community wealth. Promoting youth social entrepreneurship will not only highlight to the younger generations that they have viable alternative options beyond employment, but it will also help to reduce societal issues such as poverty. Thus, awareness and cultivation of relevant characteristics with university students would arguably increase the potential for them to lean towards social entrepreneurship as their career choice. Increasing the rates of social entrepreneurship from the younger generation will then ensure a sustainable critical mass of social enterprises within the country that will create impact and drive community development agenda.*

Purpose - *The purpose of the research is to investigate the level of awareness and intention for social entrepreneurship among university students in Malaysia.*

Design/methodology/approach - *The study use quantitative analysis. Survey conducted among students in institutions of higher learning provider. Sampling technique that will be used is convenience sampling. And finally, the data will be analyzed using partial least squares structural equation modeling (PLS-SEM) to examine and test the model.*

Findings - *This study is expected to provide insights for the motives to be socially responsible as well as formation of ideas for solving societal problems or issues in entrepreneurial manner.*

Research limitations - *This study was limited to student among universities in Malaysia.*

Originality/value - *A review of the body of work on entrepreneurial intention among the youth in Malaysia had recognised a research gap on the determinants for social entrepreneurship intention. Thus, with this study, expected outcome will be a set of recommendations for better policy interventions and programs to encourage the Malaysian youth to become social entrepreneurs.*

Keywords : intention, social entrepreneurship, youth

Mobile Entrepreneur Programme by Zakat Institution: A Proven Programme for Poverty Eradication

Nurbani Md Hassan[1], Noor Ashikin Mohd Rom[2]

[1,2]Multimedia University, Cyberjaya

Abstract

Background - *The rapid and complex development, high living costs coupled with Covid-19 pandemic has left our Government grapple with poverty and income inhequality. However, the existence of Zakat Institutions with its poverty eradication programmes has reduced the burden of the Government in combating the poverty isues, particularly among Muslims. Mobile Entrepreneur Programme (MEP) developed by the Zakat Institution in Selangor has been hailed as one of the most promising programmes for assisting participants (Asnaf) in generating income. Nevertheless, the MEP remains to be explored fully and empirical research is still lacking to address the ability and the achievement of the program in eradicating poverty.*

Purpose - *To investigate the success of the Mobile Entrepreneur Program in eradicating poverty among its recipients (Asnaf). The successful of the program is evaluated in terms of the ability and the achievement of the programme in increasing the income of the participants.*

Design/methodology/approach - *An empirical research using case study method, consisting of semi-structured interviews was conducted on 12 participants who have participated in the program for more than 1 year. Content analysis was used to analyze the interview transcripts, which resulted in generating of coding and themes from the research.*

Findings - *The results reveal the MEP succeeded in eradicating poverty among its participants since the majority of the participants managed to break-free from the 'Asnaf' status just after 1 year of participating in the programme. However, this programme requires huge amount of investment by the Zakat Institution as compared to the other economic programme. It was also discovered that he participants were able to record a commendable income, ranging from RM2,000 to RM20,000 per month as a result of participating the programme.*

Research limitations - *This research is confined to qualitative method and the geographical area of the research covers the State of Selangor only.*

Originality/value - *The research provides new insight on the unique programme by the Zakat Institution in eradicating poverty which has been successfully embraced by the participants.*

Keywords : Mobile Entrepreneur, Programme, Poverty, Zakat Institution

Can Synchronous TL during MCO sustain Student Engagement, and Interest

Yee Wan Lee[1], Dr Magiswary Dorasamy[2], Dr Abdul Aziz Bin Ahmad[3]

[1,2,3]Multimedia University

Abstract

Background - *Online learning is a common learning mode for adult learners but may not be the case for Malaysian undergraduate students especially before Covid-19 pandemic. This is because most of the mainstream universities in Malaysia offer physical learning to her full-time undergraduate students because their infrastructure, facilities and course programs are built for such learning. However, the introduction of movement control order (MCO) in the time of pandemic has interrupted this setting. Therefore, synchronous online learning (SOL) is introduced as a temporary solution to ensure continuity in learning. Nevertheless, promoting and sustaining students' interest and engagement is not an easy task. Therefore, how to promote students' interest and sustaining their engagement are two key questions.*

Purpose - *To investigate how to promote and sustain undergraduate students' interest and engagement in SOL during MCO.*

Design/methodology/approach - *Qualitative research method will be employed to gain in-depth understanding of this new phenomenal. Single case study i.e., a local private university will be selected and online focus group discussions with 50 Malaysian full-time undergraduate students from business studies will be collected as primary data. Next, offical documents collected from relevant government agencies and forum of experts from the university will be collected as secondary data. Lastly, thematic analysis using Nvivo computer software will be used to identify the emerging patterns and themes for this study.*

Findings - *Engagement and interest are two inter-linked elements in physical learning or synchronous online learning. Interest in SOL may increase student engagement and likewise, engagement will further increase interest to learn in SOL.*

Research limitations - *Exclusion of (i) science students, (ii) post graduate students, (iii) students from different nationalities and cultural background that may have different perspectives and experience with SOL. Future researchers may consider to include these stakeholders in order to have a more holistic view.*

Originality/value - *This paper is original and contributes towards developing theories or models with the acadmic community to promote interest and sustain engagement in SOL during MCO environment.*

Keywords : Synchronous online learning, Engagement, Interest, Movement Control Order

Track: Organizational Studies

Antecedents and Outcomes of Strategic Decision Making Processes in a High Velocity Environment: A Conceptual Framework

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Abstract

Background - *In a high velocity environment, the changes in technology and market are rapid and discontinuous and any decisions that require massive resources should take into account various factors. Telecommunication is an industry operating in a high velocity environment. For example, the Malaysian telecommunication organisations are feeling the effect of rapid changes in technologies, variations in customers demand and increased in competitions for a bigger share of the market. As the changes in technologies, products, and market requirements occur frequently in a high velocity environment, any position taken by telecommunication companies and advantage resulting from such positioning will be transitory and unsustainable. A different kind of competitive advantage that is sustainable over a length of time is required for industries in a high velocity environment.*

Purpose - *The purpose of this paper is to propose a conceptual framework for strategic decision making process that can be used by organisations in a high velocity environment. In this paper, the process of making a strategic decision is put forward as an internal organization capability. Strategic decision making process as an internal organization capability is posited to have a relationship with decision outcomes of competitive advantage.*

Design/methodology/approach - *A conceptual framework for strategic decision making process is developed for organisations in a high velocity environment based on literature review.*

Findings - *There are relationships between antecedents (perception of opportunity, perception of threat, positive affect, and negative affect) with strategic decision making process (rationality, political behaviour, intuition, participation, flexibility, and rule formalization). There are also relationships between strategic decision making process and decision outcomes (strategic decision effectiveness, speed of strategic decision, and technological innovation performance).*

Research limitations - *The proposed conceptual framework is limited to strategic decision making process for organisations in a high velocity environment.*

Originality/value - *From literature review, a conceptual framework for organisational strategic decision making process in a high velocity environment has not been found yet.*

Keywords : strategic decision making process, high velocity environment, conceptual framework

Confidence in Cooperative Corporations: A Systematic Literature Review

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[1,2,3]Multimedia University

Abstract

Background - *This study sets out to understand and evaluate the factors of shareholders confidence in cooperative corporation optimism regarding the risk and expected return; and confidence in future investment possibility. It employs qualitative methodology and therefore involved interpretative research paradigm. Confidence factors such transparency, trustworthiness, integrity and good governance, are the key factors in cooperatives confidence to ensure the organizations remain competitive.*

Purpose - *The purpose of the research, is to provide deeper understanding on the focus topic which is confidence in cooperative corporations towards effective corporate governance.*

Design/methodology/approach - *The study used face to face questions interview schedule as primary data collection methods complemented by documentary data analysis as a secondary method. Transfield's 5 phases was used to rigorously identify papers and analyse them.*

Findings - *The findings of this study will contribute to the agency theory in the context of shareholders' confidence within corporate governance. A complete systematic review on confidence in corporative setting is not available.*

Research limitations - *The limitations of this study are that the investors of cooperative corporation were not specified by the principles of the code such as no specific rules for how and where their management practices can be increased and no prior planning, where done, to act together with other investors.*

Originality/value - *The study would be significant to the cooperative corporation sector in Malaysia especially as the shareholders utilize the findings of this research for knowledge improvement on governance in investment portfolios and practical solution to shareholders especially to the IB40 (Indian Below 40 Group). The research gap predicted in this study is that there are many studies on the corporate governance, so far there has been no study focused on the impact of poor corporate governance and shareholder's confidence.*

Keywords : cooperative, corporate governance, shareholders ib40, confidence factors, agency theory.

Investigating the Impact of University Image on International Students' Participation Behaviour

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Abstract

Background - *The intense competition among the higher education institutions around the world coupled with the rising international postgraduate student mobility has made things very challenging for the universities to ensure their advantage. There is continuous emphasis from the higher education administrators and Governments for internationalisation and creating global prominence in this sector*

Purpose - *Realising this need for the current situation, the present study has attempted to analyse the impact of university image on international students' participation behaviour. The study has focused on the international students as this group of students' participation is crucial particularly during the time of COVID 19 due to the restrictive global mobility.*

Design/methodology/approach - *The sample of this study comprised 150 international students of HEI's in Malaysia. Purposive sampling was employed to select the respondents. The study adopted a two-phase analysis procedure. Firstly, for the university image dimensions and value cocreation behaviour dimensions, Principal Component Analysis (PCA) was applied to identify university image characteristics for the international students in the higher education institutions. The hypothesised relationships were examined using Partial Least Square-based Structured Equation Modelling (PLS-SEM).*

Findings - *The study has resulted in identifying three university image dimensions external communication and value, economic value and national-international awareness and facilities that were considered consensual even in the case of international students with multiplicity. The hypothesis result shows that the positive relationship between university image and information seeking, information sharing, personal interaction, and responsible behaviour.*

Research limitations - *This study is based on the responses from the international students studying in HEI's in Malaysia. However future studies can analyse the participation behaviour among the local students.*

Originality/value - *The outcome of this research has evidenced that the university image can lead them to students' participation behaviour such as information seeking, information sharing behaviour that can be perceived as positive behavioural outcomes towards their respective HEI's.*

Keywords : International Students, Higher Education, Students' Participation Behaviour

Track: Social Network Analysis

Social Media Supporting Business Experts' Thinking and Reasoning with Future Graduates

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Abstract

Background - *The inclusion of business experts in scaffolding students in problem-based learning (PBL) has been acknowledged as able to help students to see the practicality of experts' decisions to solve real business problems when students engage in reasoning process with the experts. However, studies that evaluate the process of the experts' thinking and how they deliver the know-how in scaffolding students online (PBL) especially when the experts resided in the students' personal learning environment (PLE) are scantly documented in the extant literature.*

Purpose - *The purpose of this study was to explore the business experts' thinking, specifically evaluating the degree of flexibility versus rigidity that the experts portrayed on Facebook.*

Design/methodology/approach - *This study employed a within-subject experimental design conducted towards three closed Facebook groups with 12 management students and six business experts and one instructor. The experts invited by the students from the students' PLE (e.g Facebook, Linkedin, family ties) to scaffold them. Hinges on the Theory of Fluid and Crystallized intelligence (Horn & Cattell, 1966) and the Strength of Weak Ties Theory (Granvotter, 1973), this study used thematic analysis of ATLAS.ti qualitative data analysis software to map the experts' comments on Facebook.*

Findings - *The findings showed business experts available in PLE demonstrated a more accommodating yet firmer approach rather than showing an expert-rigidity approach (anchoring decisions based on own past experiences and assumptions) when reasoning with the students. When comparing the type of PLE where the students invited the experts, this study refuted the previous findings that show both weak ties and strong ties provide equal strength in granting information to students in problem-solving solving activities.*

Research limitations - *This study was based on three Facebook cases. Future studies could replicate this study to test the inclusion of experts from students or instructor's PLE in other contexts to affirm the findings.*

Originality/value - *This study contributes to PBL literature on the roles of expert scaffolding derived from the students' PLE to strengthen the weak and strong ties when placing the students for collaborative PBL.*

Keywords : scaffolding, social media, business, experts, PLE

Track: Knowledge Management

Asian Culture in Online PBL: Revisiting Old Assumptions?

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[1,2,3]Multimedia University

Abstract

Background - *Asian students were described as passive and have reticence attitudes in collaborative learning. Most studies on problem-based learning (PBL) have acknowledged similar findings when placing Asian students in PBL. However, studies that confirm the validity of these claims when placing Southeast Asian (SEA) students such as Malaysia in the context of online PBL through social media are scarce.*

Purpose - *The purpose of this study was to describe the attitudes of university students in Malaysia when placing them on Facebook. The attitudes were then mapped following similarities and differences with past studies on Asian culture in PBL.*

Design/methodology/approach - *This study employed a within-subject experimental design conducted towards 84 final year management students with 23 Facebook groups were created (comprised of between four to five students per group). In each Facebook group, two business experts and an instructor joined and offered scaffolding to the students in an eight-week experiment to solve a decision-making problem. Applying the Structural Empowerment Theory (SET), this study evaluated the students' attitudes with regards to the empowerment structure (access to resources, information, opportunity, and support) received from peers, instructor, and business experts.*

Findings - *A congruence piece of evidence in this study with the extant PBL studies in Asia such as some students did not challenge or refute suggestions made by the experts. However, a few students were seen as more vocal to express conflicts openly on Facebook. Although students viewed their PBL experience on Facebook as empowering, Facebook was mainly used for clarifying learning issues that limit the full potentials of online scaffolding. On positive notes, the students were able to invite the business experts available in their personal learning environment (PLE) to scaffolded themselves, master, and coordinate their works well using technology-related tools on Facebook.*

Research limitations - *Data for this study was collected from a single class in a private university in Malaysia. Future studies may replicate this study to attest the results in other learning settings or other online platforms.*

Originality/value - *This study contributes to PBL literature on the roles of culture in shaping students' acceptance towards the structural empowerment of peers, business experts and instructor.*

Keywords : Asian learning culture, scaffolding, online PBL, the Structural Empowerment Theory

The Necessity of Real Contact Tracing Rather Than Proximity Tracing in Combating Human-to-Human COVID-19 Infection A Systemic Study

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Abstract

Background - *Many of contact tracing solutions (if not most) developed to contain Covid-19 pandemic are in the area of proximity tracing (rather than contact tracing) as it does not enable them to identify correctly the close contacts. As the world continually keeps on implementing proximity tracing to manage the pandemic, results have not been effective as intended and something needs to done to close the gap. Thus, this study will dissect the necessity of correct contact tracing solution required for Covid-19 rather than proximity tracing so that improvements and changes can be executed.*

Purpose - *This study will dissect the necessity of correct contact tracing solution required for Covid-19 rather than proximity so that better contact tracing solutions can be developed or changes can be made to the current solutions.*

Design/methodology/approach - *Methodology used in this study is the systematic study while the construction of comprehensive contact tracing characteristic framework (in order to proof which contact tracing will be better suited for Covid-19) utilises meta-analysis. Systematic study basically will cover all the related literitures focusing on Covid-19 contact tracing solutions published in journals and current available solutions. While so, meta-analysis will be the analysis on the gathered information towards making a conclusion on the necesscity of real contact tracing needed in combating Covid-19 infection.*

Findings - *From this study, a finding was made that Covid-19 requires bi-directional human-to-human type of contact tracing solution in order to effectively curb the pandemic and not proximity tracing that has low accuracy. This is because, bi-directional is able to identify correctly the source of infection and also the people whom a patient has spread.*

Research limitations - *No validation from team of experts on the framework yet, as it will be an additional study later on.*

Originality/value - *The research is unique because it addresses a problem that the whole world is facing while at the same time, proposes a solution as many of the current solutions if not most, are not able to do effective contact tracing.*

Keywords : Contact Tracing, Proximity Tracing, Covid-19

Track: Social Innovation

Corporate Social Responsibility and the Impact on Dividend Payout among Malaysia Financial Institutions

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Abstract

Background - *Corporate social responsibility (CSR) is getting more attention with the aspiration of the United Nations Sustainable Development Goals 2030. As a developing and trading nation, Malaysia aims to adopt the best practices of CSR in attracting and maintaining sustainable responsible investment (SRI). One of the main actors in Malaysian socioeconomic development is financial institutions. On one hand, financial institutions have economic responsibilities towards shareholders, and on the other hand, financial institutions are getting more pressure to meet the environmental, social, and governance (ESG) responsibilities towards stakeholders. In balancing the two expectations, Bursa Malaysia as a regulator introduced CSR's framework of reporting covering four dimensions: environment, community, marketplace, and workplace. The reporting compliance serves as a barometer of financial institutions' commitment towards CSR while delivering shareholders' dividend payout. It is hypothesized that an entity discloses more CSR information to boost its reputation, improving the earnings; hence, it positively contributes to a higher dividend payout. Additionally, it is also postulated that the entity reports more CSR information to reduce asymmetric information and capital, which shall increase the dividend payout.*

Purpose - *The purpose of the research is to examine the relationship of four dimensions of CSR and dividend payout among financial institutions in Malaysia.*

Design/methodology/approach - *The research deploys the annual report of financial institutions to capture the four dimensions of corporate social responsibility and the dividend payout. Besides, the research uses statistical analysis to evaluate the relationship of the four dimensions of corporate social responsibility towards dividend payout.*

Findings - *The research findings indicate that the community and the workplace responsibility of financial institutions have a positive relationship with dividend payout. Nevertheless, the environmental and marketplace responsibility of financial institutions has an adverse relationship with dividend payout.*

Research limitations - *The study omits other factors that may impact the dividend payout by financial institutions such as size assets, profitability, liquidity, and commitments.*

Originality/value - *The value of the research embedded in its purpose to assess the relationship of corporate social responsibility and dividend payout as financial institutions around the world are struggling to position themselves as light-bearers of sustainability in line with the aspiration of UN's SDG 2030.*

Keywords : Corporate Social Responsibility, Corporate Social Responsibility Disclosure, Dividend Payout, Financial Institutions, Malaysia.

Curbing Mental Health Issues among Malaysian Youth using Mind Reframing Techniques

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Abstract

Background - *According to the National Health and Morbidity Survey 2017, suicidal behavior was highest among Form 1 students who are around 13 years of age. Most instances it is the fear of being judged by their peers and society that they are suffering from such issues and mocked in school is one of the reasons of them not seeking help. Drawing on the issue of seeking out, mind reframing techniques could be used to enhance the use of such tests that gauge the mood and behavior of a person suffering from mental health and depression.*

Purpose - *The purpose of the research, is to use mind reframing techniques such as directive questioning and redirecting the reticular activating system (RAS) to positively motivate youth against suicidal thoughts and depressive behaviour.*

Design/methodology/approach - *The study will be conducted on Malaysian Youth between age 13 - 23 years old. This study will employ quantitative study. Survey will be used to collect primary data from youths on the use of mind reframing techniques as an alternative to gauge their mental and emotional behavior.*

Findings - *The framework will allow initial tests and ensure strong mental health among youth in Malaysia. This will uncover new insights on how DC Psychology developed by Arthur Carmazzi can be used to curb and reframe the mind to positivity. The findings will be able to fulfil the Health and Wellbeing Sustainable Development Goals and the 2nd Pillar of the 11th Malaysian Plan which focuses on enhancing inclusive development and wellbeing.*

Research limitations - *The study is limited to youths between the age of 13 23 years of age who are students of secondary schools and universities. Study will focus on primarily using Directive Questionning and reframing the RAS.*

Originality/value - *There has been limited studies in this area predominantly using Arthur Carmazzi's DC Psychology.*

Keywords : mind reframing, directive questioning, reticular activating system, mental health

Humanizing Smart City for Improved Performance

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Abstract

Background - *Malaysia is embarking into sustainable, resilient, and prosperous living conditions initiatives. As such, cities are embracing the smart city aspiration through the respective Pihak Berkuasa Tempatan (''PBT''). However, PBTs face challenges on funding allocated for smart city implementation. PBTs primarily operate on conventional business model. Most PBTs receive federal government funding. In 2018 only 45% of PBTs managed to record revenue exceeding RM1 million. Based on the current revenue profile, it is unlikely for PBTs to sustain any smart city initiatives. A more viable business model is required by PBT to embark onto smart city initiative.*

Purpose - *This paper presents a literature review in relation to the business models adopted by PBTs to implement smart cities, which in turn will present ideas on potential business models that PBT can adapt to implement smart city initiatives. This study will give impact to national agenda under the Fiscal Sustainability enabler of the Shared Prosperity Vision 2030 and Smart Cities and Transportation of the Socio-economic drivers of 10-10 MySTIE Framework.*

Design/methodology/approach - *Syntesis of researches on smart city business model for improved performance in PBT within the last twenty years from major international databases, particularly concerning pre-selected keywords, inclusion and exclusion criteria, extraction process and themes identification based on Transfield's five phases strategy. The research will cover local as well as international local councils, but to be adapted to Malaysian PBTs.*

Findings - *The study revealed that there are hardly any in depth reseach that provides the crucial elements for a successful smart city business model. We present a conceptual model based on the findings consisting 5 key elements of a successful smart city: needs, persona, sustainability, inclusivity and technology.*

Research limitations - *The study is limited to major indexed journals and conference proceedings. Other documents such as dissertations and books are not included in our search*

& nbsp;Originality/value - *This study linking smart city for PBT to improve performance in contribution towards one of the 10 priority areas of the national strategy 10-10 MySTIE framework.. The contribution of this paper is the review that will serve as an insight and way forward for smart city knowledge community.*

Keywords : smart city, PBT, business model

Determinants of Age-Friendly Environment for Social Connectedness

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Abstract

Background - *There was an urgency to restructure policies for the ageing population that addressed the forthcoming health and social needs. The ageing of population in Malaysia has created unprecedented challenges to policy makers, scholars, families and business organisations*

Purpose - *This study adapted the framework of features of age-friendly cities of WHO in 2007 in examining the age-friendly environment constructs from the perspective of Malaysian self-care middle-aged and older adults and subsequently linking these constructs to social connectedness*

Design/methodology/approach - *A survey was conducted via purposive sampling method on 402 self-care middle-aged and older adults. Firstly, features of age-friendly cities were explored through exploratory factor analysis involving 82 respondents. Subsequently, structural equation modelling was performed by employing 320 respondents.*

Findings - *The second-order confirmatory factor analysis evidenced the significant constructs of age-friendly environment were built environment, community support and health services, civic participation and employment as well as communication and information. Meanwhile, the structural model showed positive relationship between age-friendly environment and social connectedness, indicating the importance of age-friendly environment in promoting social connectedness among self-care middle-aged and older adults. This study found that not all WHO (2007) age-friendly features were significant from the perspective of self-care middle-aged and older adults in Malaysia. Implementing age-friendly initiatives in the area of built environment, community support and health services, civic participation and employment as well as communication and information allow ageing adults to improve their social connectedness*

Research limitations - *The findings may only applicable to self-care adults.*

Originality/value - *This study empirically modelled an age-friendly environment and social connectedness model through the structural equation modelling method. Structural equation modelling provided higher accuracy in predicting the research model as validity of the model was statistically evidenced through the assessment of goodness-of-fit indices. By creating an age-friendly environment that supports active and healthy living for self-care middle-aged and older adults allow them to continue to share their experiences, knowledge, and wisdom. All these are helpful and beneficial for social and economic development of the society as well as for the future generations.*

Keywords : age-friendly, social connectedness, aging, Malaysia, environment

Assessing Retirement Resources and Subjective Well-Being of Retirees in Malaysia

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Abstract

Background - *Retirement leads to the transition of the economic, psychological and social status of a retiree. Maintaining adequate retirement resources allow them to stay healthy and active that leads to greater subjective well-being. Nonetheless, in the absence of social security protection in Malaysia, to what extent retirees can meet living expenses especially with the rising cost of living have been growing concern.*

Purpose - *The purpose of this study is to assess the influences of age, gender and state residing factors that may affect retirement resources and subjective well-being of retirees in Malaysia.*

Design/methodology/approach - *A total of 649 retirees with aged more than 45years old were collected via face-to-face survey in Malaysia. Exploratory factor analysis and structural equation modelling (SEM) via partial least square were used. Split age analysis was performed on retirees from 45 years to 60 years old, and aged 60 and above to gauge in-depth insights. The variables involve financial, health, emotional, cognitive, motivational, social connectedness and social support resources.*

Findings - *Split age analysis (N=143, aged <60, N=338, aged ≥60) through SEM-PLS results showed that 41.3% aged<60retireeshave lower subjective well-being when compared to retirees aged ≥60. This might be due to they need more financial resources to support children and aging parents despite retired.Retirement resources might not adequate with rising cost of living which subsequently increase the feeling of insecure but also detriment the subjective well-being among retirees aged<60. Retirees, aged ≥60 preferred to live with spouse and children, protected from decreasing retirement resources that supported the fulfilment of their needs in later life. It is interesting to point out that retirees from Penang state indicated the highest subjective well-being among others which warrant further investigation. There is no mean differences between male and female retirees in terms of retirement resources and subjective well-being.*

Research limitations - *The findings may not able to generalisable to retirees population with different environment and cultural settings.*

Originality/value - *This paper adds new evidence by integrating multidimensional retirement resources framework which fills the research gap of current literature. Seven retirement resources and four constructs of subjective well-being were identified through second-order factors in SEM-PLS.*

Keywords : Retirement Resources, Subjective Well-Being, Retirees, SEM-PLS, Age

Expanding Foodbank Impact on Food Security

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Abstract

Background - *'Food bank' is rather a new term in Malaysia, although it has long been a feature of advanced countries such as in the UK and United States of America. Recent debates show that many scholars suggested food banks as a solution to the global economic crisis, poverty and welfare provisions. Many non-profit and religion-based organisations have also taken part to combat these issues.*

Purpose - *This study aims to carry out a market survey on food banks in Malaysia. It also examines the impact of food banks on food security.*

Design/methodology/approach - *Data collection will be carried out using quantitative survey and convenience sampling in Klang Valley. The sampling size will be based on statistical theory by Krejcie and Morgan (1970). Each survey will be administered accordingly to ensure genuine feedback from respondents as well as to avoid error or any missing data.*

Findings - *Based on the findings, it is hoped to introduce a strategic framework as a guide to establish a policy of food banks in Malaysia. Data from the market survey will be used for future research project to develop an apps namely "Food Bank for Malaysian".*

Research limitations - *The study focuses on Klang Valley area due to high population living in the area. Future research may expand the sample size to other part of Malaysia or other countries.*

Originality/value - *A new knowledge of the food bank implementation in Malaysia and as a means to contribute to the food security.*

Keywords : food bank, impact, food security, strategic framework, policy

Desired Support System to Eradicate Vagrancy

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[1,2]Multimedia University, [3]Srihana Mohamad & Partners

Abstract

Background - *Most vagrants are no longer seen as being almost exclusively male, alcoholic, drug addict and transients. The new increasing vagrants lately consist of women, children, youth, the elderly and marginalized ethnic or migrant groups. Some of them are working and earn salaries, however, the income is not sufficient to live modestly.*

Purpose - *The purpose of this research is to establish a desired support system to eradicate vagrancy issues in the country.*

Design/methodology/approach - *This is a mixed method study which integrating quantitative and qualitative techniques. The study employed a social ecological model to investigate behavior of vagrants via multiple levels of influences including intrapersonal, interpersonal, organizational, community and public policy. Surveys have been conducted on sixty-five vagrants. Qualitative method employed face-to-face interviews with key personnels of non-government organizations have been conducted for this study.*

Findings - *It was found that support systems and structures should be derived from the whole streams from communities, rulers, non-governmental organizations and agencies. Employment opportunities with adequate salary to survive in the city is not only the solution to the vagrancy, but they also in high need of certain highly demanded skills to improve their living condition.*

Research limitations - *This study is only focus on socio-economic structures of the vagrants in a capital city.*

Originality/value - *This is an empirical research using social ecological model for vagrancy in Kuala Lumpur area. Research on vagrancy study has received little attention and has yet to be fully explored.*

Keywords : Vagrants, social ecological model, government policy, support system

Mental Illness Due to Extreme Poverty: A Case Study

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[1,2]Multimedia University, [3]Srihana Mohamad & Partners

Abstract

Background - *Extreme poverty has led people to live under barely living standard, even some of them force to live on the streets. This group of people have limited access to health care and services, clean environment thus making them more vulnerable and living in fear. This highly stressful situation has linked to mental illness such as depressive disorders, anxiety disorders, psychological distress and many more.*

Purpose - *To investigate possible factors that lead to mental illness on people who are under extreme poverty and living on streets.*

Design/methodology/approach - *This is a qualitative case study which employed face-to-face interviews with keys informants and management of Pertubuhan Kebajikan Villa Harapan Melaka (PKVHM). PKVHM is a licensed care taker by Department of Welfare, Melaka that take care street people who suffered mental illness. The study applied stucturalist theory which deliberating human behaviour in the context of the social system. The tendency of the dispossessed to isolate themselves is seen as a symptom of dysfuntional, abnormal or even deviant behaviour.*

Findings - *Living under bare necessities and on the streets are extremely harmful to human's emotional well-being. They suffer distressing disturbances due to losing their homes, loss of their family members, separated from their children and other form of trauma, such as seeing violance and abusive action. They often ignorant to seek mental health care treatment due to the social stigma that sufferring from depression, anxiety and addiction. Non-supportive family relationship is also causing stress that lead to mental illness.*

Research limitations - *The study is focussing on mental illness of dispossessed people who were brought to PKVHM by Welfare Department.*

Originality/value - *This is an empirical case study on mental illness people due to extreme poverty in an organization, PKVHM. The strategies suggested may improve existing social welfare by developing healthy and fulfilled basic necessities to these extreme poverty citizens towards modern Malaysia.*

Keywords : Mental illness, extreme poverty, health care, living on streets

Determinants of Agricultural Development in Malaysia

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Abstract

Background - *Agribusiness, a product of commercial intensive agriculture practices, is a large-scale business operation that involves farming, processing, and manufacturing and may also include the packaging and distribution of food products that will ultimately lead to economic growth. Still, the amount of Gross Domestic Product (GDP) contribution by the Malaysian agriculture sector has diminished over the years as our economy moves towards more-developed secondary and tertiary sectors.*

Purpose - *The purpose of the research is to investigate the relationship of the determinants of agricultural development in Malaysia.*

Design/methodology/approach - *The data used in this study are foreign exchange rate and factor of production as independent variables which were secondary data obtained from different solid sources primarily from such as the World Bank, the Department of Statistics Malaysia (DOSM) and the International Monetary Fund (IMF). Time series data from 1980 to 2017 in annual basis that sums up to 37 observations has been used, and cointegration and causality tests have been utilized to examine on the long run and the causal relationships between the variables involved and vector auto regression method have been used to investigate the relationship between the variables.*

Findings - *The findings show that both independent variables are negatively related on the agriculture development. There are also no long-run causal relationship exists between all the variables. Based on the Granger Causality test, there are no short run relationship between all the variables, and no variables can be forecasted by the other variables.*

Research limitations - *One of the limitations found from this research, the possibility of the variables to have different relationships on different crop types are not been considered. Therefore, future research on agricultural development is to be done at different agriculture method and capital expenditure to grow different crops.*

Originality/value - *The agricultural sector in Malaysia is very dependant on the policies enforced by the government. Usually, policies targeted at directly improving the agriculture sector are more often than not lack in effectiveness and are not favoured compared to industrial-centric policies due to urban biases.*

Keywords : foreign exchange rate, factor of production, agricultural development

Track: Human Resources Management

HR Practices and Turnover Intention: The Mediating Role of Organizational Commitment

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Abstract

Background - *The renewable energy (RE) industry is recognized both as a technological- and knowledge-based industry by which its employees play a vital role in sustaining its competitive advantage. However, the RE companies in Tehran have been experiencing high employee turnover due to the high demand and the shortage of the relevant knowledge workers. As employees are the key asset for learning organization, predicting the commitment level and intention to leave is critical for organizational sustainability.*

Purpose - *The main purpose of this quantitative study is to assess the role of organisational commitment in mediating the relationsgip between the influence of Human Resource (HR) practices with the employee turnover intention among the Renewable Energy organizations in Tehran.*

Design/methodology/approach - *Self-administered questionnaire was used to collect the data by using purposive sampling mehod. Knowledge workers who have been specially trained and gone through some specific courses were identified and a total of 90 complete questionnaires were returned. The questionnaire was piloted on 30 individuals to achieve the reliability and face validity. This study adopts both descriptive and inferential analyses using SPSS.*

Findings - *The findings show that HR practices have direct influence with organizational commitment besides having indirect influence on employee turnover intention. Employee commitment was found to have indirect influence on the turnover intention. Multiple regression results indicated that the most significant influence on commitment and employee turnover intention was training and development factor.*

Research limitations - *Small sample size due to RE is a new field in Tehran and the issue fo generalizability.*

Originality/value - *This research provides insights that not all HR practices are important to the organizations. Management level should focus on those relevant HR practices in order to enhance the organizational commitment and thus to reduce the turnover issue. Hence, it is critical for managers in Tehran Renewable Energy to identidy the right HR pratices. This research may servce as one of the limited research to study the mediating tole of employee commitment in the relationship of HR practices and employee turnover intention in Tehran.*

Keywords : HR practices, employee turnover intention, organizational commitment , learning organizations, renewable energy industry

Human Capital on Mutual Fund Performance and Characteristics in Malaysia

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Abstract

Background - *Mutual fund performance has long been a well-documented in the finance literature in the past. Nevertheless, the evolution of mutual funds investment industry has changed the investors' perspective. Instead of just focusing on which funds return performances are better than another, investors pay great attentions on who are managing and delivering superior return or also known as "alpha" in their investment portfolios.*

Purpose - *It is also very scant of studies concern on human capital managerial characteristics that link with mutual funds' performance. Hence, this study integrates the fund performances, fund characteristics and human capital managerial characteristics on single, multiple and simultaneous equations asset pricing models.*

Design/methodology/approach - *Using a sample of Malaysian fund managers, drawing on data from fund management companies, Thomson One database and mutual fund master prospectus over the periods of January 2001 to December 2014, the fund performance was measured by single factor model (CAPM), and multifactor model (Fama and French, 1993). The examination was further carried out by employing the ordinary least squares (OLS) and three-stage least squares (3SLS) methods.*

Findings - *The results suggested that fund managers' possession with business degree was the key factor to determine the fund performance, while master degree was not the primary concern. The study finds that fund performance and risk behavior vary across fund managers of different gender. This study reports the expense ratio, turnover ratio, and fund objective were significant with fund performance. Taken together, these results provide the significant implications to the research study in this field, regulatory bodies and as well as mutual fund industry, contributing to a more competent mutual funds market in Malaysia. Specifically, by strengthening the fund industry policies, the typical agency problem, such as too high managerial expenses, excessive risk taking can be alleviated. Fund management companies can hire the potential fund managers based on the specific human capital characteristics.*

Research limitations - *There is restricted data availability for fund managers and Malaysian mutual funds. Hence, all data was hand collected from fund management companies.*

Originality/value - *This research highlights fund managers' human capital managerial characteristics and fund characteristics matters for fund performance model.*

Keywords : Human Capital, Fund Characteristics, Fund Performance

Work-from-Home: Workplace Ergonomics Problems and Solutions

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[1,2]Multimedia University, [3]University Tunku Abdul Rahman

Abstract

Background - *The health related issues on sprain and strain and back are recorded as the highest total direct cost paid by the Social Security Organization of Malaysia (SOCSO) to Malaysian workers since the year of 2009. This shows that the musculoskeletal diseases are no joke and involved a huge amount of financial lost. This situation has worsen after the global pandemic of Covid-19. According to Bench, (2021), work-from-home will resulting some health issues among the employees. She added that ergonomics experts and clinical professors received numerous complaints on employees are having upper back discomfort, stiff and neck issues and severe eyes strain. The downward flexion and rigid chair puts a lot of stress on cervical spine and neck. Since work-from-home may implies in several workplace for long term, it is necessary to find solutions for employees to work-from-home with proper ergonomic office equipment.*

Purpose - *This research helps to determine the causes of ergonomics problems among employees who work -from-home and to suggest several solutions n to have better ergonomics work-from–home environment.*

Design/methodology/approach - *A focus group between 4 experts from education, health care, human resources and an employee with ergonomics issues were called for an online meeting. The discussion was done approximately 2 hours discussing on the ergonomics problem and solutions for work-from-home employees during the covid-19.*

Findings - *The most common ergonomics issues tat being identified and agreed by the panels, which including chairs and wrong sitting posture, irregular key objects arrangement, laptop/keyboards/mouse distance, poor de sk posture, lack of foot-rest, distortion/noise, poor lighting and poor work ambient. Several solutions such as work-from-home ergonomics and wellness checklist is needed for every employee, webinar session on work-from-home ergonomics, meet-up session with ergonomics or HR experts, co- working space renting, 20/20/20 rules by Robin Sharma's Theory, sharing job tasks among all workers and many more*

Research limitations - *Due to movement control order, the focus group was done via online and too many participants may cause some technical issues.*

Originality/value - *Although several researchers had identified the causes of workplace ergonomics, the studies on work-from-home appears to be the new norms.*

Keywords : work-from-home, ergonomics, focus group, occupational safety and health

Proactive Measures to Eradicate Poverty in Malaysia: A Shared Prosperity Vision.

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Abstract

Background - *Malaysia aspires to uplift the bottom 40% household income group (B40) in their shared prosperity vision 2030 through addressing wealth and income disparities. By 2030, the nation seeks to eradicate poverty via provision of employment opportunities and career progression plans.*

Purpose - *To explore the rationale of strategic government intervention in managing B40 talent in IR4.0 era.*

Design/methodology/approach - *A qualitative methodology, namely semi-structured interviews with multi-stakeholders were carried out. Ten representatives from the policy makers' end, training providers, and trainees were approached in gaining insights on the nation's strategic initiatives towards the B40 group upliftment.*

Findings - *There appears to be a grey area between the nation's aspirations and actions in practice. Despite umpteen efforts aimed at the upliftment of B40 group, the goals have not been achieved. The nation is still way behind its targeted outcomes in spite of various policies being drawn out which is attributable to the mismatch between government policies with that of organisational practice.*

Research limitations - *Unavailability of statistical representation disables generalisability.*

Originality/value - *The study contributes to existing literatures as well as to practitioners in that it highlights the gap present in Malaysia's aspirations versus organisational practice. It is then suggested that all stakeholders come up with proactive strategies to ensure the right trainees are matched with the right training providers and government policies. A linkage between government policies and industry requirements need to be established as opposed to the present discontinuity. A structured training needs analysis (TNA) plan needs to be in place via collaboration between industries and governments. However, organisations should be empowered to decision making instead of constant government reliance to ensure continuous professional development for all within the organisation is embraced. B40 individuals commonly found in lower-level positions can then be pooled into the career pathway towards a shift into M40.*

Keywords : Malaysia, poverty, equality, training needs analysis, multi-stakeholder.

Skill Shift of the Workforce in the Fourth Industrial Revolution

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Abstract

Background - *The Fourth Industrial Revolution involves the evolution of technology to more automated means as well as making use of the Internet of Things. With this change in technology, jobs will also be affected. Some jobs will be obsolete, while new ones will be created. Therefore, the workforce should adapt themselves with this change in technology. The workforce will need to acquire new skills to survive in the Fourth Industrial Revolution.*

Purpose - *The purpose of this literature review is to determine new skills that are required by the workforce in the Fourth Industrial Revolution.*

Design/methodology/approach - *This study involves reviewing relevant literature such as scholarly articles and organisational reports. Literature review will be done to identify skills that are recommended based on the themes of "Fourth Industrial Revolution" or "Skills shift".*

Findings - *High level cognitive skills is required by the workforce for the Fourth Industrial Revolution. Skills such as creative thinking, decision making and critical thinking will be needed, as machines do not possess these skills. Physical based skills and average level of cognitive skills are not entirely obsolete, as they will form the basics for the new skills needed.*

Research limitations - *While this literature review covers a general deduction of what skills will be required for the Fourth Industrial Revolution, it does not necessarily apply to all organisations. An external variable such as education standards may influence skills that are required by different firms.*

Originality/value - *This paper will assist employees' supervisors, as well as training providers on the types of skills required for the workforce in the Fourth Industrial Revolution. Suitable training courses for employees to prepare them for the Fourth Industrial Revolution can be developed.*

Keywords : Skills, Fourth Industrial Revolution, Workforce

Track: Project Management

An Exploratory Study on the Determinants of Successful Collaborative Project Management in the Construction Industry

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Abstract

Background - *Project Management has become a prominent industry with significant consideration by the business. However, the fast-paced societal, environmental, economic, and technological changes prompt a revisit of the traditional project management approach. Collaborative Project Management (CPM) is a new paradigm in managing projects that respond to an agile and volatile business environment's needs by being more iterative and adapting to incremental processes in an environment that requires all project stakeholders to work together actively.*

Purpose - *This research aims to document and evaluate the gaps in the inter-disciplinary collaboration's expectations and capabilities in managing deliveries of diverse components from multiple stakeholders, using the construction projects as the study environment. The research objective is to develop a framework for successful collaborative project management within the context of the Malaysian construction industry.*

Design/methodology/approach - *This research uses sequential mixed methods to collect and analyze data in acquiring the practical meaning of knowledge in the context of construction project delivery. Mixed-method optimizes the strengths of the quantitative or qualitative method and adds rigor to the research. The exploratory stage of the study uses the semi-structured interview to identify and understand the collaborative nature of construction organizations.*

Findings - *The study suggests project management maturity, decision-making process, and knowledge management system are the variables required to deliver a successful collaborative project. Coordination among project teams explains the relationship of decision-making and knowledge management to project success, while the organizational culture and project management certification moderates the linkage of project management maturity and decision-making system towards an organization achieving successful projects.*

Research limitations - *This study interviewed project practitioners in Malaysia only. Further study on Social Cognitive Theory focuses on the dynamic interplay between person, behavior, and environment could shed more light on coordination among project teams in contributing to the project's success.*

Originality/value - *The study captures the insights of experienced, various-level construction project practitioners and translates the input into a conceptual collaborative project management model.*

Keywords : Collaborative Project Management, Knowledge Management, Construction, Coordination

Social Learning through University Social Responsibility Programme

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Abstract

Background - *University social responsibility (USR) is creating commitment to give back to society and organizational's stakeholders. Students are to be involved in such activities to expose them to the real Corporate Social Responsibility (CSR) in an organization.*

Purpose - *There is a need to look into what are the factors for student's learning while doing the activities to understand how they come out with the proposal and what are the change in their behavior after the project. This study aims to observe students learning through observation and modelling of current situation in developing a proposal and implementation process of USR.*

Design/methodology/approach - *Taking Baron's social learning theory, we observed how student think and what factors determine their behaviour and decision. Students were observed and undergo the process that determined by a three-way relationship between 1) cognitive factor 2) environmental influences, and 3) behaviour factors. The study is looking at social learning activities through the university social responsibility organized by the undergraduate students in Faculty of Management, Multimedia University*

Findings - *Using social issues in the current society as the class project provide new insights and perspective for management students. Students able to use data from research based on the cognitive and environmental factors to identify the problems and proposed an innovative solution for their target audience and at the same time learned the importance of making group decision. This activity helps students to nurture their empathy and responsibility when proposing the programme and handling the programme to meet the objectives. The students organized a cancer awareness programme and fundraising for students and staff by having various activities such as cancer awareness talk and games.*

Research limitations - *Though the students learned from the real setting of their field of study, it could be beneficial if activity can be a sustainable activities and be taken over by any unit of the University*

Originality/value - *This study used social learning theory (SLT) to produce a good USR proposal, implementation and result. The same process can enables the future batch of students to design a creative perspective on USR programme to solve social problem of the stakeholders.*

Keywords : Social Learning, University Social Responsibility, Project Management

Track: Information System

Bank Employees' Satisfaction with Anti Money Laundering System

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Abstract

Background - *Crime proceeds will infiltrate banks in the form of large cash deposits, making banks and financial institutions susceptible to money laundering. Improved process and systems in Financial Crime Compliance helps the Anti-Money Laundering(AML) analysts to place longer time and importance in case investigation and process quality works which in turn reduces the financial risks by reporting suspicious activities on a timely and effective manner.*

Purpose - *The purpose of the study is to identify the critical factors affecting employees' satisfaction with the AML system.*

Design/methodology/approach - *This study applied Job Characteristics Model to explore the critical factors affecting employee satisfaction with the AML system. Job diagnostic survey instrument was adopted to measure the five core job features of job characteristics model. Purposive sampling method was used to select the sample population and the respondents were bank employees who work in the anti money laundering department. 100 usable responses were collected and further analysed by applying various statistical techniques. Also based on the five core job features, a potential motivational score was calculated for each employee to identify the critical factors affecting employees' satisfaction with AML.*

Findings - *The results showed among the five core job characteristics task significance was highly recognized followed feedback and task identity. However, skill variety and autonomy are lacking which need to be improved in order to enhance employees' satisfaction with AML system.*

Research limitations - *The limitations of this study is the data which was collected from one specific bank employees in Malaysia.*

Originality/value - *This study addresses the knowledge gap in the anti money laundering system process and the bank employees' satisfaction.*

Keywords : Anti money laundering system, employees' satisfaction, Job characteristic model, Job diagnostic survey.

Track: Technology and Innovation Management

Is Generation Z Ready for Digital Revolution? A PLS-SEM Analysis

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Abstract

Background - *The Covid-19 pandemic has spurred business to the new height of technology innovation. Looking ahead, financial institutions have begun to transform financial services digitally by leveraging the use of artificial intelligence. Hence, users' willingness to accept artificial intelligence's adoption will significantly affect the financial services' efficiency.*

Purpose - *This study proposes a research framework based on the technology acceptance model theory to understand generation Z's perceptions and behavioural intentions to accept artificial intelligence adoption in financial services.*

Design/methodology/approach - *To analyse the data collected from 150 survey questionnaire, this study employed partial least squares analysis to test the proposed hypotheses.*

Findings - *The findings showed that perceived ease of use and attitude positively influence Gen Z's acceptance of AI's adoption in financial services.*

Research limitations - *Nonetheless, one of the limitations faced is the distribution of questionnaire. Due to the pandemic, the distribution is done through the digital platform, which we have ignored the face to face distribution of questionnaire where it may lead to a better interpretation of questionnaire.*

Originality/value - *This study could benefit the financial institutions in identifying significant factors in influencing AI's adoption and improving users' experience by filling the gap between information technology and financial services.*

Keywords : Technology Acceptance Model (TAM), intentions to adopt artificial intelligence in financial services (INT), perceived usefulness (PU), perceived ease of use (PEoU), attitude (ATT)

Task Delegation and Risk Ordering Relation for Autonomous Banking

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Abstract

Background - *Digital transformation is changing the structure and landscape of future banking needs with much emphasis on value creation. Autonomous banking solutions must incorporate on-the-fly processing for risky transactions to create this value. In an autonomous environment, Role based access control (RBAC) has been proven relevant for this principle to work.*

Purpose - *The primary objective is to provide a working solution for autonomous banking using task delegation use cases with the aid of risk graphs, risk bands and finite state machines.*

Design/methodology/approach - *This paper highlights a step by step task delegation process using a risk ordering relation methodology for autonomous loan approvals.*

Findings - *A Risk Based Access Control (RkBAC), technique implemented upon access controls classifications to eliminate barriers for autonomous transaction processing. Task delegation with risk ordering relation is illustrated using an automated loan approval use case.*

Research limitations - *Time constraint did not experimentation and testing to be extended to all types of loan approval cases.*

Originality/value - *Novelty of this study is that it highlights how delegation of task policies can be autonomously executed for FinTech platforms akin to the idea of federated ID (Liberty Alliance). The paper introduces application of risk graph and risk ordering relation with reference to delegation of a role which is nonexistent in RBAC.*

Keywords : FinTech, RkBAC, RBAC, task delegation, risk ordering relation

Preliminary Study on the Awareness of P2P Lending Platforms in Malaysia

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Abstract

Background - *The availability of internet and the common use of mobile phones in Asia in recent years has open doors for various types of FinTechs platforms, including P2P lending. Since 2016, the Securities Commission (SC) in Malaysia has given licenses to only 11 P2P lending platforms. Such lending platforms are expected to disrupt lending services of traditional lenders in the coming years. However, being still in their infant stages, it is important to know the extent to which such platforms are made known to potential investors out there.*

Purpose - *This study aims to examine the extent to which the 11 P2P lending platforms in Malaysian are aware by potential investors.*

Design/methodology/approach - *Using non-probability sampling method, a sample of 70 university students, majoring in Finance, were asked to answer a questionnaire, consisting of three main parts: demongraphic, financial literacy and P2P lending awareness. A well-established financial literacy questionnair from Global Financial literacy Excellence Center (GFLEC) is incorporated into our questionnaire. To test the awareness of P2P lending platforms in Malaysia, questions related to main characteristics of P2P lending were asked.*

Findings - *As expected, the majoriy (82%) of respondents in the sample have good (36%) and very good (46%) financial literacy. However, 72% of them is not aware that P2P lending is a direct lending from lenders to borrowers. One third of respondents agree that obtaining loans from P2P lending platforms is easier as compared to that of banks. There are always about more than half of students in the sample appear to have no ideas about the potential high default risk (52%), no or less collateral requirement (56%), higher interest rate (44%), and shorter loan approval time (40%). As a result, one may expect a lesser awareness about P2P lending found for university students, who are not majoring in finance.*

Research limitations - *A small pilot sampe is used in this study for exploratory purpose. The study was conducted with university students majoring in finance.*

Originality/value - *Findings of the study shred lights on the current awareness of P2P lending platforms in Malaysia among university students who are potential investors of such platforms in the coming years.*

Keywords : P2P lending, financial literacy, Malaysia college students, awareness, preliminary study

P2P Lending Platforms in Malaysia: Opportunity or Risk

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Abstract

Background - *With the recent evolution of Fintech, 11 peer-to-peer (P2P) lending platforms are regulated by the Securities Commission (SC) in Malaysia, since 2016. P2P lending platforms offer new investment opportunities to individual investors to earn higher rates of return than what traditional lenders normally offer. However, individual investors may face higher potential risks of default from their borrowers. Therefore, to make an effective investment decision, it is essential for individual investors to understand the potential exposure to such P2P lending platforms.*

Purpose - *This study aims to explore potential exposures that individual investors may experience at the 11 licensed P2P lending platforms in Malaysia.*

Design/methodology/approach - *Various information is collected from the 11 P2P-lending platforms. Comparative analysis will be made across those platforms in various areas, such as credit rating, interest rates, loan purposes, loan duration, collateral requirement, default risks, etc.*

Findings - *The findings of the study show that credit ratings are done differently by the 11 P2P lending platforms. This means one borrower may obtain different credit ratings from different platforms. Information related to the credit analysis about individual borrowers is not available to investors. Financial information of individual borrowers is not available or limited to individual investors on many platforms. The average interest rate offered by each platform is ranging from 9% to 14%. However, information on how interest and principal payments are to be repaid is not clearly communicated to individual investors. Each loan campaign is listed for a short period of time, leaving investors very little time to make a rational investment decision, especially to those whose financial literacy is limited. All platforms only offer loans to SMEs and not individual borrowers. It is made clear to all investors by all platforms that they are not responsible to their investors in covering default loans. Commonly, investors are advised to diversify their investment across various borrowers.*

Research limitations - *The analysis is made to only P2P lending in Malaysia, and solely based on the information observed from the 11 platforms at the time data is collected.*

Originality/value - *This study provides the very first and original insights into the current P2P lending platforms in Malaysia.*

Keywords : P2P lending platforms, default risk, SMEs, individual investors, credit rating

High Performance Work Practices in R&D Organizations: Myth or Reality

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Abstract

Background - *Despite the existing number of R&D talents, R&D in Malaysia has yet to become the main driver of the country's competitiveness. As R&D becomes a designated economic enabler, the Eleventh Malaysia Plan greatly emphasized the necessity to build high quality R&D talents. To support this aspiration, this study recognized the importance of high-performance work practices (HPWP) to stimulate innovative R&D performance.*

Purpose - *This study aimed to investigate the implementation of innovation-enhancing HPWP in different types of Malaysian R&D organizations- government research institutes, private R&D companies, R&D units and universities. This study also sought to identify dimensions of HPWP that have significant influence on R&D project performance.*

Design/methodology/approach - *A survey was adopted to measure the perception of R&D project leaders and members. The questions measure various aspects of R&D project performance and six dimensions of HPWP, namely, HPWP-oriented employee recruitment, training and development, performance appraisal, rewards and compensation, employee participation; and job design.*

Findings - *Different business models and operating environment contribute to a variation in the nature of R&D projects and the subsequent performance measures across these R&D organizations. It was also found that, to a certain degree, innovation-enhancing HPWP are already in place although the patterns of implementation differ across organizations. While each HPWP dimension has a positive relationship with R&D project performance, all six HPWP dimensions influence only a small percentage (8%-20%) of R&D project performance. This finding concurs with the view that most HPWP do not have significant effect in project performance as oppose to operational business environment. As R&D projects are temporary, HPWP implementation might not be financially feasible.*

Research limitations - *The questionnaire conducted in this study was not preceded by qualitative expert interviews with HR managers from these R&D organizations. Therefore, this study was not able to accurately identify whether these organizations strategically designed and implemented a formal innovation-enhancing HPWP program. Regression analysis also indicated the need to identify other factors that can influence R&D project performance.*

Originality/value - *Despite the limitations, these findings can become a guide for managers to develop a cohesive set of HR practices which will stimulate researchers to be innovative.*

Keywords : high-performance work practices, HPWP, R&D project performance, innovation, Malaysia

Development of Alliance Capabilities Measures in University-Industry R&D

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Abstract

Background - *Based on the literature, alliance capabilities studies have long emerged since year 1990s, whereby the studies mostly accrued on firm-to-firm collaboration. On the other hand, the discussion on university-industry alliances slowly emerged from year 2000s.*

Purpose - *Alliance capabilities have been portrayed as a crucial quality in any collaborations in order to achieve the targeted outcomes and sustainable relationships. As most of alliance capabilities studies are focusing on firm-to-firm collaboration, the study on university-industry R&D alliance is still scarce. Thus, the measurements items for alliance capabilities in the context of university-industry R&D collaboration are still hard to find. In order to investigate how alliance capabilities affecting the R&D performance of university-industry R&D alliances in Malaysia, the measurement items of alliance capabilities must be defined.*

Design/methodology/approach - *As a precursor of the main study, this paper intends to properly define the measurement items for alliance capabilities in the context of university-industry R&D alliances. The measurement of alliance capabilities has been adapted from various literature to accommodate both university and industry perspectives. In finalizing the measurement, in-depth pre-testing has been done with five strategic management subject matter experts in ensuring face and content validity.*

Findings - *This paper identifies alliance management capability measurement as goal setting, process configuration, alliance structure, coordination, management support, and alliance evaluation. The second dimension is alliance integration capability that further measured as relational capabilities, inter-organizational communication, relational capital, and project team effectiveness. Meanwhile, the last dimension is alliance learning capability that can be measured through alliance experience, knowledge articulation, knowledge sharing, knowledge codification, internalization, and relationship learning.*

Research limitations - *Although this study has been able to come up with a set of measurement items for alliance capabilities that can be fit into university-industry R&D alliances, further statistical analysis is required to validate this scale.*

Originality/value - *Up to this point, it is possible to conclude that quantitative measurement items for alliance capabilities in the context of university-industry R&D alliances are still in an infancy stage. Although the measurements are yet to be statistically analyzed, they can be used as a benchmark for future university-industry R&D alliances studies.*

Keywords : alliance capabilities, university-industry, alliance management capability, alliance learning, alliance relationship

Enhancing Innovative Delivery in Schools using Design Thinking

Sharmini Gopinathan[1], Anisha Haveena Kaur[2], R Kanesaraj Ramasamy[3], Murali Raman[4]

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Abstract

Background - *The pandemic has created masses of challenges in all sectors of the economy and education is no exception. Traditional approaches to teaching seems futile in the new context, thus the need to constantly reinvent the delivery to suit the fast-paced changes in the education domain. Hence, Design Thinking (DT) may be an alternative solution and approach that might be useful in the given context. DT is known to be a human-centric approach and an innovative problem-solving process rooted in a set of skills. This approach may be employed in the delivery process to develop the twenty-first century skills and enhance creativity and innovation. DT redefines problems in an attempt to identify alternative strategies and solutions.*

Purpose - *The purpose of this research is to introduce teachers to fundamentals of design thinking, and its application in enhancing and facilitating innovative content delivery by leveraging on creativity.*

Design/methodology/approach - *This study will provide teachers in Malaysian schools with the fundamental knowledge and application of the DT steps. In addition, a comparative data will be collected and analysed to see the transformation in the delivery of content by teachers. This data will be further analysed to seek co-relations between the DT steps and successful transformation of content delivery by teachers.*

Findings - *This research establishes a framework to the application of design thinking for teachers as the primary support in developing activities for their students*

Research limitations - *This research will be limited to schools that allow permissions for our research team to provide training and obtain necessary data.*

Originality/value - *This research seeks to fill the gap towards creating a more interesting method of delivery in schools in addition to constantly innovating the methods to suit the evolving generation.*

Keywords : Design Thinking, Innovative Teaching, 21st Century Teaching, Malaysian Schools

The Effect of Green Value Chain on Company's Performance

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Abstract

Background - *Researchers have studied the green initiatives by companies, including the use of the value chain. Nonetheless, limited studies used the complete value chain developed by Porter (1985) and most of them are conceptual or qualitative in nature. There is a lack of efforts to examine the impact of the company's initiatives in greening the value chain on the performance using quantitative research design.*

Purpose - *The purpose of the study is to examine the construct of the green value chain developed in Ong, Goh, Goh and Yong (2019) on company's performance. This is to validate if the companies' commitment to greening their value chain leads to superior performance.*

Design/methodology/approach - *This study further analysed data in Ong et al.'s (2019) study to examine the effect of the nine green value chain activities on the company's performance of the Malaysian corporations. The sampling frame of the study consists of the companies in Bursa Malaysia and the Federation of Malaysian Manufacturer Directory. 207 responses were collected and analysed using the multiple-linear regression analysis.*

Findings - *The results show the R-square is 0.255. This means 25.5 percent of the changes in company performance are explained by the green value chain activities. Among the nine green value chain activities, only green technology development ($B=0.257$; $p<0.05$) is significant in explaining the company's performance. The results indicate that the visibility of the green activities and commitment towards green technology development is crucial for the companies to achieve superior performance. Unfortunately, based on the mean score, the companies commitment to developing green technology is the lowest among all the value chain activities.*

Research Limitations - *The instruments used in the study needs to be further validated and the research can be replicated in different contexts*

Originality/Value - *This study extended the study of Ong et al. (2019) to fill the research gap of lack of quantitative research to examining the nine green value chain activities of company's performance. The findings of the study is crucial for companies to develop initiatives to greening their value chain and achieve superior performance.*

Keywords : Green Value Chain, Company's Performance, Malaysian Corporations

Technology Adoption Journey Map for Facilitating Mass Adoption of Agriculture Technology

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Abstract

Background - *Modernisation of agriculture through the adoption of modern technology is crucial to ensure the sustainability of the food supply and to spur economic development. Thus, both the public and private sectors are willing to invest in the research and development of modern agriculture technology. Nonetheless, the transformation of the agriculture sector requires the mass adoption of modern technology.*

Purpose - *This article intends to propose a framework to facilitate modern agriculture technology adoption among agriculture-based businesses. The framework should comprehensively cover the complete journey of technology adoption, instead of a single point evaluation by the businesses.*

Design/methodology/approach - *This study reviews the Diffusion of Innovation theory and adapts the customer journey map to develop the framework to aid the mass adoption of modern agriculture technology. A key focus in Diffusion of Innovation theory is the uneven rate of adoption of innovation or technology among the users, namely the innovator, early adopter, early majority, late majority and laggards. In addition, the users have to go through different stages of the adoption process in technology adoption. On the other hand, the customer journey map focuses on the total experience of customer management.*

Findings - *The study envisioned to provide the technology adoption journey map to help advance mass adoption of modern agriculture technology among agriculture-based businesses. The development of technology adoption journey map helps to guide and advance the numbers the early adopters reaching critical mass for adoption of technology in agriculture. The technolody adoption journey map should consist of vital touch points with the key stakeholders, actions required by adoptors and key stakeholders, expected risk and recovery actions. The planned technology adoption journey is crucial to eliminate or minimise the undesirable experience or pain points experienced by the innovators and early adopters paving way for mass adoption for the latter adopters using the technology adoption journey map.*

Research limitations - *The proposed technology adoption journey map needs to be further validated through empirical study.*

Originality/value - *This study looks at adoption as an experience journey instead of a single-point evaluation on adoption decision through the technology adoption journey map.*

Keywords : Diffusion of Innovation, Technology Adoption Journey Map, Agriculture Technology, Customer Journey Map.

The Implications of Industry 4.0 on Supply Chains Amid the Covid 19 Pandemic–A Systematic Literature Review

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Abstract

Background - *The recent global pandemic, COVID 19, causes significant disruptions in supply chains. The increased demand for products and the decreased supply of raw materials interrupted the production processes amid the pandemic. The emerging technologies of Industry 4.0 has the potential to streamline the supply chains by improving time sensitive customized solutions during this emergency.*

Purpose - *Epidemic impacts have been widely explored in humanitarian logistics literature; however, the case of the effects of pandemics in industrial supply chains has not been adequately addressed. To fill this gap, the current study presents a comprehensive analysis of the impacts of epidemic outbreaks on supply chains and how these impacts can be mitigated through employing Industry 4.0 technologies.*

Design/methodology/approach - *An extensive literature review using the "Preferred Reporting Items for Systematic Review and Meta-Analysis" (PRISMA) method is done on the impact of COVID 19 pandemic on supply chain, and Industry 4.0 technologies. The systematic literature was undertaken by selecting keywords validated by experts and conducted search in the Scopus, Web of science, the ProQuest, and the Google Scholar databases, selecting the publications from leading journals on the topic. The bibliographical search resulted in 6630 articles followed by multiple layers of filtering and finally selected the most pertinent articles for reviewing and analyzing totalling 36 articles.*

Findings - *This study discussed the massive impact of the COVID 19 pandemic on the supply chain and found how the emerging technologies of Industry 4.0, such as, Internet of Things (IoT), big data, cloud computing, and additive manufacturing can help manufacturers to ease the impact. These technologies will enhance the production system through the automation and optimization of production flow convergence enabling efficiencies and improvements in communication among the suppliers, manufacturers, and consumers, including the human and the machine in COVID 19 situation.*

Research limitations - *As the COVID 19 pandemic is developing, changing its patterns and growing. Novel theoretical developments and large-scale empirical studies are needed but the current context is yet to allow such extended studies. The systematic literature review will help us to broaden the knowledge base, and explore new avenues for empirical research.*

Originality/value - *The study summarized the impact of the COVID 19 pandemic on supply chains and showed the potential of Industry 4.0 technologies to lessen the impact on manufacturing supply chains which is valuable for the policymakers and practitioners to get insights and take necessary actions.*

Keywords : Industry 4.0, emerging technologies, supply chain, COVID 19

An Examination of Factors that Affect the Adoption of E-Wallet in Malaysia

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Abstract

Background - *In the era of innovation in information technology, everything is embedded with technology. There is no exception in the financial sector as well. The term "FinTech" origins with "Financial Services Technology Consortium" in the late 19th century. It was initially applied at the back-end systems of financial and banking institutions. However, now Fintech has been shifted to a more customer-oriented way. Fintech can be explained as the combination of financial services and information technology where it provides financial services for consumers through technology and covers everything from cryptocurrency to mobile wallets application. E-wallet is one of the examples of Fintech in payments and infrastructure that can be freely adopted by everyone. High adoption of E-wallet can lead a country to move towards a cashless society and have a better economic growth and environment. However, the penetration of E-wallet usage in Malaysia is still on its early stages as compared to other countries.*

Purpose - *Therefore, this research is to examine the factors that affect the adoption of E-wallet in Malaysia based on 5 aspects: perceived ease of use, perceived usefulness, perceived risk, social influence and government support.*

Design/methodology/approach - *This research is carried out using questionnaire to a targeted group of 100 respondents of e-wallet user in Malaysia using convenient sampling method. The multiple regression analysis has been carried out to analyze the relationship of each factors towards the adoption of e-wallet among the respondents.*

Findings - *The result shows social influence has a significant relationship with adoption of E-wallet in Malaysia due to majority of the respondents are at their prime age and their behaviors tended to be influenced by the reference group.*

Research limitations - *The sample of the respondents is limited to the certain areas due to the Covid -19 pandemic even though it has been carried out using online questionnaire.*

Originality/value - *The results from this studry can be used by the SME in Malaysia in digitalized their business through the e-wallet adoption in transforming their conventional business to digital business and spur the digital economy in Malaysia.*

Keywords : E-wallet, Fintech, digital business, SME, digital economy

The Role of Technology Readiness and UTAUT2 in E-Wallet Adoption in an Emerging Asian Economy

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Abstract

Background - *One of the key agenda of ten-year master plan which is known as Financial Sector Blueprint of Bank Negara Malaysia is to lead the country towards a cashless society by 2020. To embrace the concept of a cashless society, the central bank has taken various steps to encourage the adoption of e-wallet. E-wallet plays a critical role in transformation of the payment system. Despite the seamless services offered by e-wallet and large growth potential, e-wallet is yet to reach high-scale adoption in Malaysia*

Purpose - *This study aims to investigate the role of technology readiness of Malaysians toward e-wallet, a new technology and their perceptions of e-wallet usage by employing Extended Unified Theory of Acceptance and Use of Technology (UTAUT2) model*

Design/methodology/approach - *A total of 309 usable data of Malaysian e-wallet users were collected using questionnaire and analysed with partial least squares structural equation modelling (PLS-SEM). Four key personality traits from technology readiness, namely optimism, innovativeness, discomfort, and insecurity are the exogenous variables and interrelated with performance expectancy and effort expectancy from UTAUT2.*

Findings - *The findings revealed that Malaysians are confident that the use of e-wallet will bring positive and desirable outcomes. The findings showed that the respondents were optimistic of the new technology and tended to believe that e-wallet was somehow useful for them. However, insecurity did not present significant influence on both performance expectancy and effort expectancy of e-wallet, suggesting that the feeling of uncertainty was not a concern when it comes to e-wallet adoption. The results also revealed that e-wallet adoption intention was significantly affected by performance expectancy, price value, facilitating conditions, and was followed closely by social influence.*

Research limitations - *The limitation stems from the cohort differences that arise from the e-wallet usage experience. Since the respondents have different e-wallet usage experience, their perceptions toward such payment tool might be somewhat different*

Originality/value - *This study holds a substantial contribution to technology acceptance studies by combining UTAUT2 with technology readiness to investigate the role of technology readiness of Malaysian and understand their perceptions toward e-wallet. Four human personality traits were looked into in e-wallet environment setting.*

Keywords : e-wallet, UTAUT2, cashless payment, technology readiness, Malaysia

Factors Affecting the Adoption and Usage of Mobile Banking among Generation Y Consumers in Malaysia

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Abstract

Background - *By 2018, the Malaysian mobile banking industry has the third largest amount (RM78.36 billion?) of banking transactions made, behind the internet banking (RM6075) and credit card (RM100 billions). The popularity of mobile banking has attracted many mobile phone users, resulting in 1,688.8 million transactions, surpassing those of internet banking (557.2 million) and credit card (366.4 million). Thus, mobile banking services in Malaysia appear to be under usage in Malaysia.*

Purpose - *This study examines factors affecting the intention to use and the actual use of mobile banking services in Malaysia.*

Design/methodology/approach - *In addition to the seven variables (performance expectancy, effort expectancy, social influence, facilitating conditions, hedonic motivation, price value, and habit) adopted from UTAUT2 ((Venkatesh et al., 2012), the study incorporates two more variables into its framework: perceived risk (Featherman and Pavlou, 2003) and interface design quality (Bharati & Chaudhury, 2004), to examine their impacts on the intention to use mobile banking and actual use of mobile banking among Malaysians. A questionnaire was designed based on the prosposed framework. Using the purposive sampling technique and Morgan's sampling table, a sample of 536 Malaysians from generation Y was targeted and interviewed in Klang Valey from June to March of 2018.*

Findings - *Findings show that common factors that affect significantly on the actual use and intention to use of mobile banking among Generation YMalaysians are: habit, facilitating condition, interface design quality. Perceived risk and intentional use are found to have significant impacts on only the use of mobile banking, while effort expectancy is found to have only significant impact on only the intention to use.*

Research limitations - *As qualitative method is employed in this study, the proposed model can explain 55% of actual use and 60% of intentional use. Thus, the use of additional variables as well as qualitative technique, may help to increase more explainarary powers for the actual use and intention to use.*

Originality/value - *Findings of the study provide significantnew knowledge in the area of mobile banking, from which potential solutions can be developed by mobile banking providers and interface designers to increase the usage of mobile banking services in Malaysia.*

Keywords : mobile banking, perceived risk, intention to use, interface design, UTAUT2

Cashless Transactions: A Study on E-Wallet Acceptance among University Students

Anushia Chelvarayan[1], Yeo Sook Fern[2], Han Hui Yee[3], Hazlaili Hashim[4]

[1,2,3,4]Multimedia University

Abstract

Background - *E-wallet is an application that enable users to download by using a mobile device. It is a new trend for consumers to use e-wallet application to replace the traditional payment method. With E-wallet, an user does not need to bring cash or credit card along with them. It makes users to purchase their needs and wants in a more convenient way. Due to the advancement of technology, there are a lot of E-wallet platforms that exist in the market such as Touch n Go, Boost and Grabpay. Consequently, this research aims to study the factors that affect the university students' intention to use e-wallet by adopting the Technology Acceptance Model (TAM)*

Purpose - *The research emphasizes on factors affecting university students' intention in using E-Wallet. It focuses on the following variables which are perceived usefulness, perceived ease of use, perceived risk and trust.*

Design/methodology/approach - *The Technology Acceptance Model (TAM) serves as the theoretical underpinning for this research A total of 140 people from a Malaysian private institution took part in this study. Convenience sampling was used to pick samples, and respondents completed the questionnaire using a Google form and a paper and pencil approach. The questionnaire was created using a nominal scale and a five-point Likert scale. Descriptive analysis, reliability analysis, and multiple regression analysis were utilised to analyse the data in this study.*

Findings - *All the independent and dependent variables were found to be reliable, and the model was also deemed to be fit. Based on the results, the researcher finds that the perceived usefulness, perceived risk and trust were significant with the intention to use E-Wallet among students. Meanwhile, perceived ease of use did not have a significant relationship affecting students' intention in using E-Wallet for their daily financial transactions. Students, supervisors, academics, researchers, learning institutions, commercial organisations, and the government will all benefit immensely from the data and information gathered in this study because we will be able to examine and understand the factors that influence students' decision to use an E-Wallet for their daily financial operations.*

Research limitations - *This study, however, has certain limitations in that it does not reflect the complete student population in Malaysian tertiary education and only examines four variables: perceived utility, perceived ease of use, perceived danger, and trust. Future study could focus on other impacting elements such as trust, risk, complexity, pervasive technology use, tech-savvy future generations, and so on.*

Originality/value - *This research is very useful for business organisations especially during these challenging times. The research focuses on tertiary students who will be the future consumers in the next five to 10 years. Hence, gauging their perception on E-wallet transactions will give us a glimpse of their future needs.*

Keywords : E-Wallet, Intention, University Students

Enterprise Resource Planning (ERP) Implementation on Organizational Performance: Case Study of a Science & Technology Park (STP) Organization in Malaysia

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Abstract

Background - *Enterprise Resource Planning (ERP) has long been recognised as a critical component of many businesses' overall success in today's rapidly changing market environment. ERP systems were created with the goal of integrating data and optimising production across functions and resources in order to boost organisational efficiency. ERP is critical for enhancing the ability to control commercial activities, which, when combined with an organization's existing competitive advantages, results in a competitive advantage. However, our practise review discovered that end users resist ERP implementation because the resulting changes will alter the current status quo. Implementing an ERP system in an organisation is complex, as it affects multiple areas of the business. Resistance to change is cited as a factor in ERP failure.*

Purpose - *The purpose is to analyse the factors that contribute to resistance of user, and more informed decision makers to have the information necessary to successfully complete the actions required to achieve success in the case of STP.*

Design/methodology/approach - *Through a systematic literature review using Transfield's 5 stages, the reasons for end users' resistance to change, issues and challenges in ERP implementation and way forward, will be investigated to uncover the missing piece of information that may illuminate the hidden reasons for such behavioural change and inform the knowledge community.*

Findings - *The result of this study is a conceptual framework for ERP system implementation based on three kernel theory/models namely the Social Technical System (STS) theory, the Balanced Scorecard (BSC), and the Accelerated SAP (ASAP) methodology.*

Research limitations - *The study is limited to Science and technology park context.*

Originality/value - *The study will help Malaysia achieve its vision of becoming a high-tech nation by 2030 and will benefit the scientific community of ERP practitioners and researchers. Additionally, it would focus on the end-user perspective and perspectives on the ERP system's post-implementation at the selected STP. Additionally, the study will broaden our understanding of the ERP's effectiveness, particularly in terms of an organization's operational performance.*

Keywords : enterprise resource planning (ERP), organizational performance, competitive advantage

Efficiency Improvement in IoT Use for Elderly NCD Patients in Malaysia: Extending the Practical Implementation of Theory of Planned Behaviour

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Abstract

Background - *The rapidly aging population in Malaysia is no more a surprise especially due to the sudden increasing rate of infertility and greater life expectancy creating an impact on the overall mortality percentage. Nearly half or 40% of healthcare expenses are expected to yield from the growing number of elderly people.*

Purpose - *The Theory of Planned Behavior (TPB) which analyses the behavioral intention, is incorporated into this study on the use of IoT among elderly NCD patients. According to TPB particular "cognitive-emotional" and "attitudinal" factors determine the behavioral intention of the consumer or user. It is assumed that intention is required for a particular behavior in any context. This theory also presumes, "every behavior is preceded by an intention even though not every intention is interpreted into action".*

Design/methodology/approach - *The conceptual framework developed in this study will evaluate the current attitude of such elderly patients in incorporating IoT technology, societal and environmental factors in influencing them to adopt to technology, along with the constraints leading to the intension behavior among the population. This, in turn, is expected to render developing efficient communication to all the stakeholders in increasing awareness among the targeted elderly NCD patients population*

Findings - *The outcomes of this study are expected to produce meaningful insights for regulators, healthcare institutions and IT technology enterprises to collaborate in designing meaningful campaigns disseminating true benefits of IoT devices, by aiming to change the attitudes of elderly patients, improve their confidence*

Research limitations - *The study was undertaken in a single country (Malaysia), which is a constraint on generalisability. This study only applied a quantitative method*

Originality/value - *Analysing the relational impacts of the constructs in the framework for this study will ultimately enhance the intention of IoT technology's use among elderly patients in Malaysia.*

Keywords : Theory of Planned Behaviour, NCD patients, IoT in Healthcare, Malaysia

Improved Back Test of Magic Formula in Malaysian Stock Market using Applied Programming and Online Quantitative Platform

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Abstract

Background - *Joel Greenblatt's Magic Formula has proven effective in the different stock market over the world. However, there is no academic research to investigate its effectiveness in the Malaysian stock market.*

Purpose - *To fill in the gap of apply Magic Formula in the Malaysia Stock Market. This study applied programming and quantitative finance method to backtest Malaysian stock data from 2004 to 2019. On the other hand, to propose an improved Magic Formula that is more suitable for the Malaysian market, different variables are also tested in this study.*

Design/methodology/approach - *This research uses a programming method and online quantitative platform to backtest the Magic Formula in the main stock market of Malaysia. Besides, this research tests different financial indicators, market capital and portfolio size for finding the optimal Magic Formula. CAPM model and t-test were applied to evaluate the performance and significance. Risk-reward of portfolios also considered.*

Findings - *The results showed that Greenblatt's original formula did not perform significantly in the Malaysian market. Also, as the result of the optimal formula test. Compared with Earning before interest and tax(EBIT), Gross profit (GP) is more suitable in the Malaysian stock market. Meanwhile, the market capitalization of a company has a significant impact on the rate of return.*

Research limitations - *The Magic formula we applied in this research ignore the timing. Thus, the result was only a theoretically return. On the other hand, the selection method of this research only basis on quantitative data analysis. It may result in logical or theoretical errors hidden.*

Originality/value - *This research is original. It is the first academic backtest of Greenblatt's Magic formula apply in the Malaysian stock market. Meanwhile, the improved Magic Formula for the Malaysian stock market proposed after tests with different variables. Even though the result of this research cannot be applied to the market directly. It serves as an attempt to quantify the value of stocks in the Malaysian market and provides ideas and methods for future value quantification researchers.*

Keywords : Magic Formula, Value investing, Programming, Investment strategy Back-test.

Factors Influencing the Usage of E-Wallet among Students in Malaysia

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[1,2,3]Multimedia University

Abstract

Background - *Nowadays, mobile payment systems (e-wallet) are becoming popular and have great potential to overta ke cash and become the most prominent means of completing transactions. Even, the government of Malaysia introduces an incentive award under its e-Tunai Rakyat and e-Belia programs to promote cashless society.*

Purpose - *The objective of the research is to study the factors affecting the usage of electronic wallets such as on food delivery platforms, independent platforms (TouchNGo) or any bank-based platforms. The independent variables used in this investigation were perceived ease of use, trust, perceived usefulness, perceived risk and social influence.*

Design/methodology/approach - *The theoretical foundations for this study are based on The technology acceptance model (TAM). The study used a non-probability convenience sampling technique to collect data from respondents. A sample of 379 participants were involved in this study. The research instruments used in this study was adopted and measured through a Likert-type scale with five items from several journals.*

Findings - *The study found that the trust, perceived usefulness, perceived risk and social influence have significant relationship with the intention to use e-wallet among students in Malaysia. The only variable that has no significant relationship is perceived ease of use.*

Research limitations - *The sample size is among the limitation of this study which is does not represent the population of students in Malaysia. This also boils down to the fact that due to the large differences in age groups, education levels and income levels, they cannot be evenly distributed in demographic data.*

Originality/value - *This study defined the variables influencing the propensity to use e-wallet. It will greatly assist the Malaysia's government to create more campaign to increase the adoption rate of e-wallet usage. Besides, this study can be used by entrepreneurs as a guide when determining if their businesses can run and provide e-wallet services. It will also help to accelerate the acceptance of e-wallet used in Malaysia and enable the digital payment (e-wallet) to be used by the public, small businesses and retail stores as well as proceed Malaysia to a cashless society.*

Keywords : e-wallet, intention, cashless society

Stakeholders' Readiness in the Development of an Islamic Smart City

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Abstract

Background - *Smart City integrates systems with the latest technologies to enable fast track of information and decision making by individuals, government, businesses, and public. Smart City connects people and information to manage public amenities, control crime rates, enhance services effectiveness, create vibrant, competitive, and innovative cities, and improve quality of life. Islamic Smart City can be defined as a smart city that incorporates the Islamic Syariah from Al- Quran and Hadith as way of life; and impart the main component of Islamic Syariah compliance in individual and organizational behavior aspects such as ethics, cleanliness, trust, security and others.*

Purpose - *This research is mainly to explore the stakeholders' readiness in four aspects of technology, human, institutional and Islamic factors, which are important in the development and implementation of the Islamic Smart City.*

Design/methodology/approach - *The research design is qualitative using interview with selected stakeholders. The finding shows that the stakeholders' readiness in the technology and are high; but is lacking in the institutional, and the Islamic factors.*

Findings - *The findings will provide government some insights of stakeholders' readiness which is crucial stage in development of any new projects such as the Islamic Smart City.*

Research limitations - *This research includes only main stakeholders in the interviews. Future research can be conducted using quantitative method with bigger samples, to enable the state government to design a long-term strategic framework that take into considerations of all the factors to ensure the success of the Islamic Smart City project.*

Originality/value - *Contributes new information on the establishment of smart cities globally, that imparts the Islamic values as way of life in the era of new technologies.*

Keywords : Islamic, Smart City, Stakeholders, Readiness

FinTech What Should be Taught Really?

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Abstract

Background - *Digital transformation is completely changing the landscape of education specifically in the content for teaching and learning as well as it's pedagogy for multiple courses in finance and accounting. Universities are now pressured to ensure that their graduates are equipped with skills necessary to fill in the void of digital technology skillsets in areas such as FinTech, Distributed Ledger Technology, Crypto assets and big data. Accounting and finance graduates aren't competent when real world applications and use cases are assigned to them and this is largely due to the lack of inclusion of digital topics in the design of the finance curriculum. With technological revolution being the core of IR4.0, graduates will not be able to meet relevant skill sets if curriculum is only focused on accounting information systems being the major element of our academic curriculum.*

Purpose - *To highlight the inclusion of digital Finance and Technology (FinTech) content into the teaching and learning curriculum and pedagogy that will make our graduates future ready*

Design/methodology/approach - *The approach used in this study is a combination of meta-analysis from a systematic literature review and expert consultation from the industry which includes inputs from the academic champions forum which is periodically organized by CIMA and AICPA.*

Findings - *Selective content inclusion into tertiary curriculum that can be used for curriculum updates by academic institutions that will also be recognized equally by the American Accounting Association (AAA) and Association to Advance Collegiate Schools of Business (AACSB) as well as professional accounting qualifications.*

Research limitations - *Time constraint did not permit the study to be extended towards country comparisons.*

Originality/value - *Novelty of this study is that it is inclusive of both academia and industry expectations. Given the speed of digital transformation this study is also timely.*

Keywords : Digital age, FinTech, Analytics, Pedagogy, Curriculum

Search Engine Optimization (SEO) Strategy as Determinants to Enhance the Online Brand Positioning

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[1,2]Multimedia University, [3]Mm Smart Earth Resources

Abstract

Background - *Marketers face evolution of online brand positioning marketing strategy due to changes of search engine algorithm that affect brands reach outs to best potential Internet users. Brand owners realise that to be relevant in modern market, they need to migrate and focus more on online market. However, many brand owners have ignored the power of search engine optimisation (SEO) strategy to attract online market rapid changes and tough competition. One brand can be considered as an oldfashioned if it does not utilise the SEO as their marketing strategy in penetrating the online marketplace. Various studies have been conducted on factors that can enhance the persistency of using SEO strategy, with gaps in studies on its relation with online brand positioning.*

Purpose - *The main purpose of this study is to identify the persistency of using SEO strategy inclusive using of the niche point of differentiation, valuable content, targeted keyword and scalable link building, as the determinants that enhance the success of online brand positioning.*

Design/methodology/approach - *This study applies quantitative design using survey to gather information from the online business entrepreneurs, and useful for online entrepreneurs to focus on the use of SEO as a new way to strategise in their online business.*

Findings - *Based on the findings, it is hoped that the online entrepreneurs will take into consideration of the SEO strategy in their brand positioning in the marketplace.*

Research limitations - *The study focuses only on the online entrepreneurs in Malaysia.*

Originality/value - *A new knowledge of brand positioning for online entrepreneurs using SEO strategy to capture and sustain its market.*

Keywords : SEO, online brand positioning, determinants, marketing, strategy

Prediction of Emergency Triage System on Machine Learning using Emergency Severity Index (ESI)

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[1,2,3]Multimedia University

Abstract

Background - *Triage is to reduce needless medical complications in life-threatening circumstances. Triage system are required in every hospital Emergency Department (ED). The most factor in triage patients are by receiving list of chief complaint or symptoms. Many existing algorithms used in triage system such as Australasian Triage Scale (ATS), The Canadian Triage and Acuity Scale (CTAS), The Manchester Triage System (MTS), and The Emergency Severity Index (ESI).*

Purpose - *To study the dynamic triage systems available, using ESI as the algorithm in triage system, and implement machine learning such as Decision Tree Classifier (DT) and Random Forest Classifier (RF) to predict the triage level based on the chief complaint or symptoms.*

Design/methodology/approach - *The performance of prediction triage using machine learning models are compared such as Decision Tree Classifier (DT) and Random Forest Classifier (RF). Study design and setting that will show the study dynamic triage system available in terms of terms of their conditions and limitations by conducting literature search.Study process and analysis will be explored to show the analysis in selecting the algorithm and triage algorithm to be used will be displayed. Machine Learning (ML) in triage system will show the model to be implemented and User Interface will show the developed dashboard. Finally, data preparation and data collection regarding dataset used and evaluation parameters are derermined fpr accuracy.*

Findings - *The findings show a fool-proof algorithm that the machine learning can predict the accurate result in triaging the patient and help the medical assistance or triage officer during triage assessment. In order to predict the dataset are required to provide an accurate result. The system successful to predict the level triage with the accuracy for Decision Tree Classifier (1.0, 100%) and Random Forest at (0.94, 94%).*

Research limitations - *Inaccuracy of information fed to the machine learning system will lead to inaccurate triaging.*

Originality/value - *This study is a good platform for further research study to develop a good triage system to show the reliability of the algorithm. A successful implementation will give a better approach to medical assistance or triage officer in their task field.*

Keywords : Triage, Emergency Department, Algorithm, Machine learning, multi-class classification

Track: Knowledge and Innovation Management

Knowledge Creation for Digital Innovation: Systematic Literature Review

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[1,2,3]Multimedia University

Abstract

Background - *Knowledge creation is a key component for digital innovation. The proliferation of technology has further accelerated the need for processing complex knowledge in the context of Information Technology project (IT) delivery, particularly for decision making based on new knowledge creation. Literature suggests that knowledge creation in IT projects can improve digital innovation. This study presents a systematic literature review and the result of our practice review that implies the importance of KC for the success of IT Projects based on five challenges pertaining to the current environment in Malaysia. Findings revealed the lack of research on knowledge creation in IT projects contributing to digital innovation and warrants greater academic attention.*

Purpose - *This study presents a systematic literature review using rigourous method to provide indepth insights on knowledge creation for digital innovation. The resulting findings will contribute to the understanding of the area of research.*

Design/methodology/approach - *Synthesis of researches on knowledge creation for digital innovation within the last twenty years from major international databases, particularly concerning in pre-selected keywords, inclusion and exclusion criteria, extraction process and themes identification based on Transfield's five phases strategy.*

Findings - *The study revealed the depth of knowledge creation for for digital innovation are hardly any. To date, digital innovation research is mostly concerning on three aspects covering challenges, concepts and practices. Our review presents two major findings. First, only limited work has been done in three knowledge creation-IT projects: (i) factors, (i) process and (iii) methods. Second, only limited research has been done in linking digital innovation with knowledge creation. We highlight role of knowledge creation to accelerate digital innovation towards achieving digital economy. We believe that these two findings warrant the attention of the research community.*

Research limitations - *The study is limited to major indexed journals and conference proceedings. Other documents such as dissertations and books are not included in our search.*

Originality/value - *This study linking knowledge creation to digital innovation in the context of Industry 4.0, ultimately to achieve digital economy. The contribution of this paper is the review that will serve as an insight on knowledge creation agendas for digital innovation.*

Keywords : Knowledge Creation, Digital Innovation, Digital Economy, Literature Review

Forecasting Private Higher Education Institutions Sustainability Through Frugal Innovation

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Abstract

Background - *This paper aims to present the findings of our investigation on the interrelationship between Intellectual capital (IC) and its effect on frugal innovation (FI). Using a knowledge-based view (KBV), the possible linkages was examined from the lens of Information technology (IT) capabilities as a mediator. Focus was on private Higher Education Institutions(PHEI) who are facing poor profitability, increased short-term debts with under-resourced cash flow, and insufficient funds that could lead to financial insolvency or at a high risk of financial failure. Frugal innovation can give light to these challenges.*

Purpose - *This paper was designed to present literature review, research gap analysis and insights gained to study the effects of intellectual capital on frugal innovation.*

Design/methodology/approach - *This paper presents a systematic literature review based on journal papers published in last two decades from major online databases. Pre-selected keywords, inclusion and exclusion criteria, extraction process and themes identification are included based on Transfield's five phases strategy. Pre-selected keywords, inclusion and exclusion criteria, extraction process and themes identification are included based on Transfield's five phases strategy.*

Findings - *The study revealed the depth of frugal innovation for PHEI is hardly any. The findings identified key constructs that is crucial towards determining technology capability that will influence frugal innovation in PHEI.*

Research limitations - *There are some limitations for new research to not only examining the role of intellectual capital but also to understand the application of new business model for PHEIs through frugal innovation.*

Originality/value - *Till to date, there are insufficient research that explores on the relationships between organizational IC dimensions, information technology capabilities and frugal innovativeness in the PHEIs in Malaysia. This study able to fill the gap by examining the effect of IC on frugal innovation through information technology capabilities dimensions. Acknowledgement: We thank the Malaysian Ministry of Education for awarding a Fundamental Research Grant Fund (FRGS/1/2020/SS02/MMU/02/3) to conduct this research. The findings shared in this paper is part of this project.*

Keywords : intellectual capital, frugal innovation, IT capabilities and higher learning institution

Green Campus University: Problems and Prospects

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[1,2]Multimedia University, [3]MM Smart Earth Resources

Abstract

Background - *Sustainability is a crucial social issue. Recently, many scholars suggested that somewhat the issue has to be exposed at universities. Universities act as world leaders in education, research and innovation, of which in good position to foster progressive action and address this global issue within current and future generations. As universities seek to create more sustainable campuses, the green campus approach can lead to opportunities to initiate a cultural paradigm shift, whereby universities become global leaders in sustainability.*

Purpose - *This paper intends to examine the problems and prospects of creating a green campus university.*

Design/methodology/approach - *Data collection will be carried out using qualitative method that includes observation via visits to the selected universities to gather information that relates with green campus practices such as UPM, UKM and UM; and interviews with the panels of experts in respective ministry and government agencies about the problems and prospects of going green in Malaysia including MOA, KeTTHA and SWCORP. The collected data will be analysed by using NVivo software.*

Findings - *Based on the findings, it is hoped to introduce a strategic framework as a guide to assist all sustainability initiatives in higher education setting of Malaysia.*

Research limitations - *The study focuses only on three oldest universities in Malaysia. Future research may expand it to other universities in Malaysia.*

Originality/value - *A new knowledge of creating green campus universities in Malaysia and as a means to create sustainability in higher education setting.*

Keywords : green campus, sustainability, university, problems, prospects

Digital Taxation to Promote Frugal Innovationin IHL: Research Gap

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[1,2]Multimedia University

Abstract

Background - *In facing the era of fourth industrial revolution (IR4.0), the idea of digital taxation has been arising to continue accelerate the economic growth in the country. While in the digital transformation of technology which high penetration of electronic devices, Malaysia government has introduced digital taxation aimed at creating a level playing field in the digital sector. On 2019 national budget, Malaysia government has announced digital tax will be carried out on January 2020. Singapore follo by Malaysia is the countries in Southeast Asia to introduce tax scheme for the digital sector.*

Purpose - *The purpose of this research is to study on the digital taxation for creating frugal innovation for institute of higher learning(IHL) educational ecosystem. In Malaysia, government had exempted online distance learning to fall within the definition of digital service, in order to encourage online distance learning, and it will be exempted from service tax. These changes have greatly impacted the tertairy education to deliver education service with lower costs. Thus, in this study, the theory of digital taxation will be discussed in contribution to frugal innovation in IHL.*

Design/methodology/approach - *The methodology for this paper is research gap analysis using major databases, keywords and categories of research in this field. Data was analysed to answer research question on the trend in digital taxation and how frugal innovation can play an important role. Data was analysed and presented.*

Findings - *Through the model of digital taxation for IHL to achieve frugal innovation, the result of this study will bring a significant impact on the financial control towards IHL. The theory of digital taxation, and also the tax policies, on the influence on IHL will be discussed in this study. A framework of analysis will also be developed that allow to highlight the main tax theory on contribution to frugal innovation in IHL. The research will come to light with ideas and ways to build frugal innovation in IHL educational ecosystem.*

Research limitations - *This study presents research gap analysis in the field to unearth the need for more research. However it is limited to IHL and digital taxation only between last 2 decades.*

Originality/value - *This study is novel as there is hardly any evidence of frugal innovation relating to digital taxation within the context of IHL.*

Keywords : digital taxation, frugal innovation, ihl educational ecosystem

Environmental Management System and Organisational Performance in Malaysian Manufacturing Industries: Mediating Role of Green Innovation

Kalaivani a/p Jayaraman[1], Jayashree Sreenivasan[2], Magiswary Dorasamy[3]

[1]UTAR, [2,3]Multimedia University

Abstract

Background - *Massive industrialization has brought magnificent growth to the Malaysian industry in the area of technology and science by boosting its production capabilities, however, this revolution has left a huge impact on the environment. Most pertinent being pollution and erosion of natural resources. Industries need to take corrective actions to overcome the pertinent issues and at the same time promote sustainability by adopting and implementing an Environmental Management System (EMS).*

Purpose - *The purpose of this study is to fill a gap in the literature on the use of EMS in the Malaysian manufacturing industry. The details further will warrant the development of a holistic model that can be adopted by industries certified with ISO 14000.*

Design/methodology/approach - *This research employs a positivism research paradigm. Based on theoretical aspects, this study will access whether green innovation mediates the relationships between determinants of the Environmental Management System (EMS) and organizational performance. Quantitative survey methods will be used to collect data drawn from Malaysian Manufacturing industries which are certified under ISO14000 EMS. Collected data will be analyzed using Structural Equation Modelling using SPSS AMOS version 26. Questionnaires comprised of closed-ended questions will be distributed using a simple random sampling method.*

Findings - *The effects of green innovation on EMS and organizational performance have been investigated by testing the proposed hypothesized structural model. The result showed the impact of green innovation as a mediator on the determinants of EMS towards organizational performance. The results can promote EMS growth and a holistic model in Malaysian manufacturing industries based on sustainable development initiatives of the 12th Malaysian plan.*

Research limitations - *The mediating relationship between green innovation and EMS can be investigated further in service industries in future studies.*

Originality/value - *While there has been a significant amount of research done to investigate the link between EMS and organizational performance around the world, little is known about the mediating effect of green innovation, particularly in the Malaysian Manufacturing Industries context as it is considered as one of the key contributors in Malaysian GDP.*

Keywords : EMS, Organisational Performance, green innovation.

Track: Data Analytic

Customized Economic Stimulus Package Recommender System to Cushion the COVID-19 Impact

Rathimala Kannan[1], Ivan Wang Zhi Wei[2]

[1]Faculty of Management, Multimedia University, [2]Multimedia University

Abstract

Background - *Malaysian government reacted to the pandemic's economic effect with Prihatin Rakyat Economic Stimulus Package (ESP) to cushion the Covid-19 impact of low-income households and others. The ESP consists of cash assistance, utilities discount, moratorium, EPF cash withdrawals, credit gurantee scheme and Wage subsidies. A survey conducted by Department of Statistics Malaysia (DOSM) shows that different households preferred different type of assistance. This forges the need to have a customized economic stimulus package in order to effectively manage the economic burden among low-income households (B40).*

Purpose - *The purpose of the research is to propose a customized ecomomic stimulus package recommender system by leveraging data analytics and machine learning techniques.*

Design/methodology/approach - *This study used secondary dataset obtained from DOSM titled as "Effects of Covid-19 on the Economy and Individual'- Round 2". This special survey was conducted online on the 10th to 24th April 2020. Dataset had 41,386 responses with 38 variables. Cross-Industry Standard Process for Data Mining (CRISPDM) is followed to develop machine learning models to classify ESP receivers according to their preferred assistance types. Machine learning techniques such as Neural Network, Decision Tree, Gradient Boosted Tree, Random forest and Support Vector Machine will be applied to build the predictive models for each of the assistance type offered in the ESP. The optimal model will be selected based on sensitivity, precision and F-score metrics.*

Findings - *The expected findings are machine learning models which can predict individual household's preferences from ESP. These models could be used to design customized economic stimulus packages which would be useful to effectively manage the ecomomic burden of low-income households.*

Research limitations - *This study used only secondary data obtained from the Department of Statistics Malaysia.*

Originality/value - *To our knowledge this is the first study which applied data analytics and machine learning techniques on survey data and proposed customized economic stimulus package recommender system.*

Keywords : Covid-19 survey, Economic Stimulus Package, Data Analytics, Machine learning

Do the COVID-19 Vaccines Boost Market Efficiency? The Case of the US and the UK

Manar Abushosheh[1], Shabbir Yusuf Bohara[2], Elgilani Elshareif[3], Davide Contu[4], Ilkhlaas Gurrib[5]

[1,2,3,4,5]Canadian University Dubai

Abstract

Background - *The COVID-19 pandemic has caused major public health and economic disruption; at the same time, these and related events, allow researchers to assess market efficiency. Namely, whether, to what extent, and how swiftly stock markets incorporated information around COVID-19. Soon after the outbreak of the pandemic, research on this front has been conducted, with a particular focus on the US market. However, new major events linked to the pandemic have unfolded: a number of vaccines were announced and authorized. In correspondence of such events, scant is the research available in relation to market efficiency.*

Purpose - *The aim of this study is to assess the market efficiency hypotheses with regards to the US and British markets, investigating the impact of the positive news of the vaccines' successful trials and, subsequently, their authorization.*

Design/methodology/approach - *This work considers data from the S&P500 for the US Market, and the FTSE100 for the British Market. The time interval considered ranges from the date of first positive results of vaccines' trials, 18th November 2020, until two months after the vaccines' authorization that happened later in the year (February 2021). For both markets, we analyze the daily returns, cumulative returns, standard deviation and average returns.*

Findings - *It emerges that in both markets, the US and the UK, there has been a positive effect of the vaccines' announcements in terms of increase in the daily returns. However, the standard deviation was not found to increase substantially notwithstanding the increase in the COVID-19 cases all over the globe and the potential lockdown in several countries as well as the fear from new versions of Coronavirus strains that the new vaccines might not be able to protect us from. Remarkably, a major difference emerges between the two markets considered: the UK market seems to reflect vaccines' announcements faster than the US Market.*

Research limitations - *This research focuses on general indexes (S&P500, FTSE100), whereas different magnitudes of impacts, and speed of reaction, might be found when considering specific sectors. This left for further research.*

Originality/value - *This study contributes to the understanding of the impact of vaccines' announcements on stock markets' returns.*

Keywords : Market efficiency, COVID-19, COVID-19 vaccines

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ICCM 2021

International Conference on Creative Multimedia

Virtual Conference
June 21-23, 2021

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CONFERENCE CHAIR MESSAGE

We are delighted to welcome you to International Conference of Creative Multimedia (ICCM 2021) by Multimedia University (MMU), Research Synergy Foundation (RSF), and Canadian University, Dubai (CUD) that held virtually on June 21-23, 2021.

Prospective authors are cordially invited to participate and help shape the conference through submissions of their research abstracts that are upgradable to Scopus indexed journal. We welcome high-quality research contributions dealing with original and unpublished results on fundamental, conceptual, empirical and experimental work in all areas of arts, design and creative media technologies.

It has been our privilege to convene this conference. Our sincere thanks, to the conference organizing committee; to the Program Chairs for their wise advice and brilliant suggestion on organizing the technical program and to the Program Committee for their through and timely reviewing of the papers. Recognition should go to the Local Organizing Committee members who have all worked extremely hard for the details of important aspects of the conference programs and social activities.

We welcome you to this conference and hope that this year's conference will challenge and inspire you, and result in new knowledge, collaborations, and friendships.

Best regards,

Dr. Fauzan Mustaffa

ICCM Conference Chair

CONFERENCE CHAIR

Dr. Fauzan Mustaffa

Fauzan Mustaffa is a lecturer and practicing designer in the area of communication design in the Faculty of Creative Multimedia at Multimedia University (MMU), Malaysia. He obtained his first degree in Graphic Design from University Technology MARA, Shah Alam in 1991 before gained his MFA in Communication Design at Central St Martins College of Art and Design, London in 1995. He worked as art director in advertising agency before pursuing his career as an academician. He is a lecturer at Multimedia University, since 1998, teaching Advertising Design related subjects.

KEYNOTE SPEAKER

Prof. Dr. Eugene Ch'ng

Assoc. Prof. Dr. Yoko Akama

Madam Juhaidah Joemin

SESSION CHAIRS

DR. ROOPESH SITHARAN

Roopesh Sitharan is an educator, researcher, curator, and an artist. His area of specialization is Malaysian contemporary art, New Media cultures, and curatorial practice. He often examines the boundaries of meaning and value in the production and interpretation of art and new media practice. Sitharan has been actively involved in several national and international projects and showcases such as APICTA, Petaling Jaya, Malaysia; Gwangju Biennale, Gwangju, South Korea; ISEA 2009, Singapore; and Siggraph 2005, California, USA. His writings have been published in several local and international journals and magazines such as Learnardo Electronic Almanac (LEA), “CTRL+P” Contemporary Art Journal from Philippines, Dokumenta 12, “Sentap” magazine, and many others.

Dr. Dennis O. Dumrique

Dr. Dumrique is a researcher and an educational manager who currently works as a full-time Associate Professor of Polytechnic University of the Philippines College of Education. He teaches both in the undergraduate level and in the graduate studies. His field of expertise includes Educational Management, Curriculum Development, Professional Education, Research, and Business Education.

He is also the former Associate Dean and Chairperson and also a former Chief of the Research and Accreditation Center of the said college.

Dr. Eric S Parilla, DBA, FBE

Currently the VP for Research and Community Extension and the dean of college of business education of northwestern University. He is a graduate of doctor of business administration and the current research interests are supplychain mgt, entrepreneurship and human resource mgt.

Dr. Lim Yan Peng

Dr. Lim Yan Peng a graduate from California College of the Arts, USA (1992) in Bachelor of Fine Arts (BFA)- Graphic Design and Master of Fine Arts (MFA)-Graphic Design (1995) from Yale University, School of Arts, USA. Doctor of Philosophy (Creative Multimedia) from Multimedia University. (2010).

She teaches undergraduate in Media Art and Post Graduate program in FCM cover the range from Digital Content for Graphical User Interface, Media Art, HCI, Usability and User Experience **.** Her extensive areas of research and publications in virtual education, cultural heritage and Interactive design in digital space have gained both local and International recognitions. Specifically, her interests in art and design has further enhanced her publications in conferences, International Journals and exhibitions, as well as made into a chapter of a book.

Dr. Silvia Catalan Ambag

Dr. Silvia C. Ambag is an expert in the field of education, research, publications and extensions. Currently Education Consultant in Quezon City University, and Editorial Board in International Journal of Theory and Application in Elementary and Secondary School Education (IJTAESE). Indonesia, Board Member and Finance Officer in Asia Pacific Consortium of Researchers and Educators (APCORE), Malaysia Management Committee.

Invitations as an expert in research made Dr. Ambag a recognized Senior Reviewer in the Fifth Annual Conference on Asian Studies, Japan and a member of the Royal Fellow Institute in Singapore. Journal reviewer in WASET Journal in New York. She is also member of the Association of Scholarly Editors and Association of Scholarly Reviewers of Philippine Association of Institutions for Research, Inc.

CONFERENCE PROGRAM

Day 1, Monday, June 21st, 2021

Time (UTC+8)			*Dur'*	*Activity*
ICCM Room 1				https://us02web.zoom.us/j/84463489011?pwd=SkdobzcrWWo3RllnbUxwajJNRW42UT09 Meeting ID: 844 6348 9011 Password: DIFCON21
13:45	-	14:00	0:15	**MC Welcoming**
14:00	-	14:30	0:30	OPENING INTRODUCTION BY DR FAUZAN
14:30	-	15:30	1:00	KEYNOTE 1: SPEAKER: PROF. DR. EUGENE CH'NG TOPIC: "Digital Transformation in Our Interpretation and Communication of Cultural Heritage"
15:30	-	16:30	1:00	KEYNOTE 2: SPEAKER: ASSOC. PROF. DR. YOKO AKAMA TOPIC: "What does it mean to design in uncertain worlds?"
16:30	-	17:00	0:30	**Break**
17:00	-	18:15	1:15	FLUTTER WORKSHOP MR. AHMAD SHAH Workshop 1: "Creating Cross Platform Mobile Apps Using Flutter, The New Google Development Tool" Google Meet link: linktr.ee/iccm21

Day 2, Tuesday, June 22nd, 2021

Time (UTC+8)	*Dur'*	*Activity*
ICCM Room 1		https://us02web.zoom.us/j/87001257950?pwd=alkrWlZDTHJEVGlySWwyelE3cW13Zz09 Meeting ID: 870 0125 7950 - Password: DIFCON21
9:50 - 10:00	0:10	**MC Welcoming**
10:00 - 11:00	1:00	KEYNOTE 3: SPEAKER: MADAM JUHAIDAH JOEMIN TOPIC: "The Future of Creative Business: Innovation, Inclusion and Sustainability"
11:00 - 11:05	0:05	Session Chair Introduction
11:05 - 13:35	2:30	**Presentation Session 10 person/room -** 15 minutes/presenter
13:35 - 13:45	0:10	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
13:45 - 14:15	0:30	**Break**
14:15 - 16:50	2:35	INDUSTRY FORUM (MODERATED BY MDM NADIA MAHMUD) Mr. NIZAM RAZAK, Mr. VJ ANAND, Mr. ZIKRI KHOLIL Forum Topic: "The Creative Industry Trends, Outlooks and Paradigm Shifts"
16:50 - 17:20	0:30	**Break & Go to Main Room**
17:20 - 18:40	1:20	UNITY WORKSHOP MR. AHMAD SHAH Workshop 2: “Build your own 3D Microgames using Unity LEGO” Google Meet link: linktr.ee/iccm21

Day 3, Tuesday, June 23rd, 2021

Time (UTC+8)			Dur'	Activity
ICCM Room 1				https://us02web.zoom.us/j/84572294908?pwd=bUNHYllJV2tTMU13N1E1V2V0Z0l0QT09 Meeting ID: 845 7229 4908 Password: DIFCON21
9:30	-	9:35	0:05	**MC Welcoming**
9:35	-	9:40	0:05	Session Chair Introduction
9:40	-	12:10	2:30	**Presentation Session 10 person/room** 15 minutes/presenter
12:10	-	12:25	0:15	Break
12:25	-	12:30	0:05	Session Chair Introduction
12:30	-	15:00	2:30	**Presentation Session 10 person/room** 15 minutes/presenter
15:00	-	15:10	0:10	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
15:10	-			Break & Announcement to go to Main Room at 16.30

Day 2: Tuesday - June 22, 2021

ICCM - Room 1

https://us02web.zoom.us/j/87001257950?pwd=alkrWlZDTHJEVGIySWwyelE3cW13Zz09
Meeting ID: 870 0125 7950 - Password: DIFCON21

Session 1: 11.05 - 13.35 (UTC+8)
Session Chair: Dr. Roopesh Sitharan & Dr. Dennis O. Dumrique

Track Art

Paper ID	Presenter	Paper Title
CCM21111	Siew Wai Kok	A Case Study of the Portrayal of Home in Short Films
CCM21126	Zainudin Bin Siran	Conceptual and Final Design Connectivity: Conceptual Framework Model

Track Communication Design

Paper ID	Presenter	Paper Title
CCM21115	Nor Alley Zulkafly	Design Thinking Process Towards User-centered Visual Communication for Social Media.

Track Creative Industries

Paper ID	Presenter	Paper Title
CCM21101	Suhazri Amrin Rahmad	Simulated Kalman Filter for Solving Travelling Salesman Problem Based on Numerical Ordering
CCM21108	Fauzan Mustaffa	Evolution of the Melaka Bridges Throughout Ages

CCM21116	Khor Jing Ying	Laser Scanning and Photogrammetry Techniques: A Review
CCM21117	Ban Pin Yao	Surface Reconstruction: Techniques and Applications
CCM21122	Siti Khadijah Ali	Forward Kinematics for 3D Human Tari Silat Movements
CCM21123	Fauzan Mustaffa	A Study Of Position And Orientation Of The Bridge Of Melaka Sultanate
CCM21128	Fauzan Mustaffa	Geo-mapping of the Grand Mosque of Melaka Sultanate
CCM21131	Sri Kusuma Wati Mohd Daud	Entrepreneurships Education for Design Project

Track Creative Multimedia

Paper ID	Presenter	Paper Title
CCM21102	Elyna Amir Sharji	Using Multimedia Gallery Framework Components to Understand Better the Process of Designing and Developing Multimedia Gallery Spatial Layout Environment
CCM21103	Cheng Kin Meng	A Qualitative Study of Online Gamified Learning for Recycling Intention

Day 3: Wednesday - June 23, 2021

ICCM - Room 1

https://us02web.zoom.us/j/84572294908?pwd=bUNHYllJV2tTMU13N1E1V2V0Z0l0QT09
Meeting ID: 845 7229 4908
Password: DIFCON21

Session 1: 09.40 - 12.10 (UTC+8)

Session Chair: Dr. Fauzan Mustaffa & Dr. Eric S Parilla, DBA, FBE

Track Creative Multimedia

Paper ID	Presenter	Paper Title
CCM21104	Erwin Jabbar	Reinventing the Contextualize Kelantanese Wayang Kulit Performance
CCM21106	Soon Hin Hew	A Study of Students' Satisfaction of Asynchronous Online Learning in Oman
CCM21113	Tenku Putri Norishah Tenku Shariman	Application of Instructional Design Towards the Creation of Multimodal Micro-Credential Upskilling Modules
CCM21119	Cavin Ramadhan	Utilizing Augmented Reality for Science Learning Experience
CCM21120	Ng Yi Kee	Sonification of Weather Data as a Non-Human-Centric Artistic Approach
CCM21121	Hossein Golshanbafghy	Using Mixed Reality to Improve Learning Experience of Entomology Students
CCM21105	Choon Hong Tan	Exploring eHealth model and its acceptance for mental wellness among digital talents

Day 3: Wednesday - June 23, 2021

ICCM - Room 1

https://us02web.zoom.us/j/84572294908?pwd=bUNHYllJV2tTMU13N1E1V2V0Z0l0QT09
Meeting ID: 845 7229 4908
Password: DIFCON21

Session 2: 12.30 - 15.00 (UTC+8)

Session Chair: Dr. Lim Yan Peng & Dr. Silvia Ambag

Track User Experience Design

Paper ID	Presenter	Paper Title
CCM21107	Ng Seng Beng	Alphabet Learning Through 3D Hologram for Slow Learners
CCM21112	Muhamad Irfan Bin Rosli	Perceptions and Learning Evaluation of a Non-Immersive Virtual Reality Application for Children with Autism Spectrum Disorder
CCM21118	Muhammad Asyraf Mhd Pauzi	Rapid Prototyping in the Era of COVID-19 in Malaysia
CCM21110	Ng Seng Beng	Colour Combination System Based on Colour Theory
CCM21124	Natalya Rudina Shamsuar	Co-Shaping for Social Impact: The PIBKS#PBL@Sekolah Initiative Experience
CCM21125	Md Najib Osman	An Approach Towards a Paradigm Shift in Adaptive Character Design for Ambient Learning Environments

Track Visual Arts

Paper ID	Presenter	Paper Title
CCM21114	Khairun Niza Mohammad Radzi	Intelligible Approach to using the ‘Art and Design Analysis' of Form, Content and Context
CCM21129	Roopesh Sitharan	Beyond Taxonomy: Art Collection in the Realm of Instantaneous Connectivity
CCM21130	Mohd Hafizuddin Mohd Yusof	Aesthetics of Data Objectification by Artificial Intelligence
CCM21109	Fauzan Mustaffa	Reconstruction Studies of the Street Market of Melaka Sultanate

Track Creative Industries

Paper ID	Presenter	Paper Title
CCM21127	Fauzan Mustaffa	The Case of Floating Market of Melaka Sultanate

Track: Art

A Case Study of The Portrayal of Home in Short Films

Siew Wai Kok[1]

[1]Multimedia University

Abstract

Background - *Be it fiction, documentary or experimental films, the portrayal of 'home' as its central subject is no stranger to filmmakers. Home can be understood as a physical living space - the house, the city and the country. It can also be understood as a social setting - the family, the community and the society with its particular customs, system of values and politics. What is more precious about home is its psychological and mental effects on human beings - the memory and the state of mind of being "at ease", a state that one feels comfortable, secure and can reveal one's true self. These personal, societal and psychological circumstances of home are depicted by filmmakers of different genres.*

Purpose - *To study films of different genres in presenting a diverse perspective of how versatile film language can be to portray subjects surrounding the notion of 'home'.*

Design/methodology/approach - *This paper consists of analysis on short films with the portrayal of home and related issues as subject matters. Four short films are selected for the study, with two of them fall under the "fiction film" category, and another two in the "experimental films" category. The study investigates aspects of film language such as cinematography, sound design, editing and storytelling, in order to learn the differences in application in fiction and experimental films respectively.*

Findings - *Through this study, it is evident that 'home' is a significant subject to explore by filmmakers across different genres as it stimulates the investigation on various essential topics in the human society such as nationalism, urbanization, humanitarian issue, familial love, individualism, mental health and so on.*

Research limitations - *The film choices are limited as a starting point in this case study. In the future, more films from different genres and cultures will be further studied to learn about the different perspectives from various societies.*

Originality/value - *In light of the current outbreak of the coronavirus pandemic where "staying home" has become a new normal, the study of the notion of home and its sustainability seems timely. This case study contributes to the contemplation and re-evaluation of issues surrounding home through the artistic eyes of the filmmakers from different genres and cultures, presenting home as a physical place, a social setting and a state of mind.*

Keywords : Home portrait, film, self, society, storytelling

Conceptual and Final Design Connectivity: Conceptual Framework Model

ZAINUDIN BIN SIRAN[1], Rusmadiah Anwar[2], Nur Farrah Najwa Misnan[3]

[1]Multimedia University, [2,3]University Teknologi Mara, Shah Alam, Selangor,

Abstract

Background - *Often inconsistent design elements exist between the conceptual design stage and the final product in New Product Development (NPD) process. Some new product features were eliminated at different stages of NPD process where each of them was controlled by different knowledge expertise including the basic form, parts detailing, or new product function. Meanwhile to structure such strategic conceptual design requires a big effort, resources, expertise, time, and cost. However, due to unclear concern factor from various stages was changing the final design to a different direction.*

Purpose - *This paper presents a theoretical framework model on how to perform design research, purposely to study the inconsistent elements and factors contributed from different domains in the NPD process.*

Design/methodology/approach - *An in-depth interview to three expert levels (each) from product designer and design ehat ngineer clarifies the specific influence factors on product development. It's followed with the design experiment through Design Protocol Analysis (DPA) methodology which involves ten novice level designers and engineers, in order to profiling the specific pattern of thinking character of influence factor, contribute to decision for the conceptual and final design of the particular product.*

Findings - *The findings from data analysis are expected to be benefit to industry and academia as a guideline for them to improve the NPD process toward optimizing the consistency design elements for design concept and final product.*

Research limitations - *This research scope is uncovering the conceptual and final product design stages only, which involved expert and novice level of product designer and design engineer as respondents, which mainly involve in NPD process.*

Originality/value - *The study will clarify the influence factors from the expert level of designer and engineer on developing the conceptual design till final product. As well as the design experiment will profiling a specific character of concern factor from junior designer and engineer. The triangulation of data collection from literature review, interview and design experiment will establishing the specific character of designer and engineer for to achieve the objective of NPD.*

Keywords : Conceptual Design, Final Design, New Product Design Process (NPD

Track: Communication Design

Design Thinking Process Towards User-Centered Visual Communication for Social Media.

NOR ALLEY ZULKAFLY[1]

[1]Multimedia University

Abstract

Background - *Creating brand experiences and engaging the consumers on a more personal level in social media required an iterative process that demands the designer to undergo series of experimentation. Visual communication produce is no longer aesthetic of commercial problems but problem-solving of a social issue.*

Purpose - *Therefore, there is a need for a learning design process of problem-solving based on social-based communication that help designer to bring back to the human-centric point of view. This study aims to approach complex problems from a human perspective by developing a new brand of a hobby kit as therapeutic activities during this pandemic*

Design/methodology/approach - *Standford's design thinking methodological framework was implemented to solve real problems and improve learning/life quality with innovative solutions through visual communication. Students undergo the process of design thinking through the 5 phases of 1) empathize by understanding the target audience and what they need, 2) define the problem statement, 3) ideate the solution, 4) develop the prototype, and lastly 5) test the design using Instagram. The participants of this study were 28 students from Multimedia Advertising Programme.*

Findings - *Using social issues in the current society as the class project provide new insights and perspective for visual communication design students. Students able to use data from research to identify the problems and proposed an innovative solution for their target audience and at the same time learned the importance of being sensitive to the environment. This activity helps students to nurture their empathy and responsibility when creating visual communication works for social media. The students created the prototype and applied the design solution in front of their target audience on Instagram. Testing the prototype allows them to gather feedback through comments and engagement also analyze data from Instagram Analytics*

Research limitations - *Though the students learned from the real setting of their field of study, it could be beneficial if activity such as retail transaction which is the goal of marketing in advertising could be performed.*

Originality/value - *This study used design thinking to produce a user-centered visual communication design for Instagram. The results show that the process enables the students to design a creative perspective for social problem.*

Keywords : Visual Communication, Design Thinking, Creative Process, Advertising Design.

Track: Creative Industries

Simulated Kalman Filter for Solving Travelling Salesman Problem based on Numerical Ordering

Suhazri Amrin Rahmad[1], Zuwairie Ibrahim[2], Zulkifli Md Yusof[3]

[1,2,3]Universiti Malaysia Pahang

Abstract

Background - *Combinatorial optimization is a problem that consists of finding the optimum combination of each component from a finite set of objects. Most meta-heuristic algorithms are designed for continuous optimization problem. Modification or enhancement is needed for continuous algorithm to solve combinatorial optimization problem.*

Purpose - *The purpose of the research is to solve Travelling Salesman Problem (TSP) using Simulated Kalman Filter (SKF) algorithm and single-solution SKF (ssSKF) algorithm based on numerical ordering technique.*

Design/methodology/approach - *The aim of the TSP is to find the optimal path between the starting city to the end city. The solution of TSP can represent into a sequence of permutation number where each number act as a city. In this research, each solution is encoded as n-number vector, each within the [-1,1] range, where n refers to the number of cities. The encoded solution is sorted in an ascending order to decide the travel series. The city with the smallest number will be visited first. The travel sequence is defined by this ordered sequence.*

Findings - *The results of both SKF algorithm and ssSKF algorithm will be compared with each others to determine which algorithm is superior in solving this type of problem. The findings obtained from the experiment conclude that performance of SKF algorithm is better than ssSKF algorithm for solving TSP.*

Research limitations - *The experiment of this research only uses 15 types of TSP function which are TSP functions that are evaluated using Euclidean distance.*

Originality/value - *Numerical ordering technique is one of the method that still has not been applied yet to SKF and ssSKF algorithms for solving combinatorial optimization problem. In this research, the technique will be applied to SKF and ssSKF algorithm to solve TSP.*

Keywords : Combinatorial, Travelling Salesman Problem, Simulated Kalman Filter

Evolution of the Melaka Bridges throughout Ages

Fauzan Mustaffa[1], Peter Woods Charles[2], Harold Thwaites[3], Eugene Ch'ng[4], Lim Yan Peng[5]

[1,2,5]Faculty Of Creative Multimedia, Multimedia University, [3]Centre For Research-creation In Digital Media, Selangor, Sunway University, [4]Nvidia Joint-lab On Mixed Reality, University of Nottingham

Abstract

Background - *Municipal plans and artist impressions of post Melaka Sultanate city have shown various forms of bridges rebuilt at about the same spot connecting the trading town of Upeh and the site of what is used to be the royal compound. Despite the bridges during three colonial periods appear to be in different forms and slightly in different positions and orientations, fundamentally they served the same strategic interest of the same city.*

Purpose - *This research was a subset of a larger reconstruction study of the Melaka Sultanate bridge that does not have a legitimate visual record. At time when the study was initiated, it was meant to set a precedent on examining if there is any common denomination between the bridges that in any way can also reflect on the bridge of Melaka Sultanate.*

Design/methodology/approach - *This research primarily focuses on visual anthropological analysis in evaluating the evolution of bridges throughout ages at the approximate location. This study is also enlightened by historical narrative analysis in supporting its discourse. The study took a pragmatic stance in seeing the different forms of bridges mainly as different design solutions in answering the same key design problems governed by the interest of the city. The study focuses mainly on collecting, describing, identifying patterns and taxonomising the idea of the bridges at a principal level.*

Findings - *Despite the bridges appear in different forms, this study has found a number of common patterns in various strategic perspectives. Amongst those, Melaka city bridges throughout ages have tendencies to be built in large constructs, elevated high from water level, wide space underneath, ample width, and in some cases, appear to have roofing on top of them. The study also has spotted interesting anomalies which lead to fundamental arguments that seemingly suggest an alternative perspective about the main gate of Sultanate fortress.*

Research limitations - *This study involves municipal plans and artist impressions that are available in the public domain during the data collection.*

Originality/value - *This study has its own contribution in serving its purpose as a precedent and an indirect idea subjected to further research in view of the bridge of Melaka Sultanate.*

Keywords : Keywords: Melaka Sultanate city, Bridge of Melaka Sultanate, Bridges of Melaka

A Study of Position and Orientation of the Bridge of Melaka Sultanate

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Abstract

Background - *It has been five hundred years since the Melaka Sultanate bridge was last seen; a bridge built under the instruction of Sultan Mansor Syah; the sixth ruler of Melaka at the Melaka River connecting the trading city and the royal compound. There is no doubt that the bridge exists and was one of the most significant Melaka Sultanate constructs with enormous importance to the city; at functional, socio-cultural-economic and aesthetical levels. However, no critical study has been done in search of the position and orientation of the bridge that relates to the current geo-location.*

Purpose - *This research is a subset to a larger study on the bridge intended for visual reconstruction purposes. The study of its position and orientation based on the current geo-environment with better precision will provide quality appreciation on measures for reconstruction study.*

Design/methodology/approach - *This study employs narrative analysis framework in carefully examining descriptive clues, position and orientation of the bridge based on various ancient text; namely from Melaka, China and Portugal that are relatively contemporary to Sultanate period. Findings from narrative analysis were cross-referenced to the collection of municipal plans of Portuguese and Dutch Melaka periods. This is to identify traceable marks which have strong evidence as the remnants of tradition from Melaka Sultanate municipal structure; as the basis to build the case of position and orientation of the bridge.*

Findings - *The finding the narrative and visual anthropological analysis suggested that the Sultanate bridge was originally located at the river bank continuously in a straight line with the primary street that passes through Kampung Bendahara. Based on sketches of the city during Portuguese Melaka period, pattern shows that the orientation of the primary street always deviates seemingly avoiding the site of Sultanate bridge. The most interesting part of the study is that the alignment between the primary street, Sultanate bridge and the main fortress gate of A'Famosa.*

Research limitations - *The study has limitation which relys on English translation especially involving original text from ancient Chinese and Portuguese.*

Originality/value - *This research contributes to a reconstruction study of Melaka Sultanate aiming for heritage tourism that is align to SDG8.9 & 11.4.*

Keywords : Melaka Sultanate city, Bridge of Melaka Sultanate, Position and Orientation of Melaka Sultanate Bridge.

Geo-Mapping of the Grand Mosque of Melaka Sultanate

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Abstract

Background - *Historical records mentioned the existence of a beautiful stone built mosque in the city of Melaka Sultanate; the finest known in the region. After 1511 war, the mosque was brought down and its stones were repurposed. Scholars discussed its possible form, decorations and symbolisms based on visual precedence contemporary to the time. Less critical study has been done to trace the precise location of it in the current geo-environment.*

Purpose - *This research is a fundamental step in its motivation to provide strategic information for the future empirical study involving ground penetration scanning to examine the remnants of the mosque for the first time after five hundred years.*

Design/methodology/approach - *This investigation believes that a massive stone built mosque very likely has a massive stone built foundation that is hard to be removed completely. This study employs two types of analysis: i) Narrative analysis; to analyse historical text which provides descriptive clues on the nature, location and measurement of the historic mosque. ii) Visual anthropological analysis; to investigate archived visuals involving municipal plans of colonial periods. This part of the study was carried out with a single-minded focus; to detect constructs surfaced in Portuguese and Dutch Melaka's municipal plans in view of the 'qiblah test'; a geo-mapping media technique in examining the alignment between i) qiblah direction, ii) satellite image and iii) constructs in municipal plans.*

Findings - *This study has found a matching construct surfaced in a relatively rare Dutch Melaka municipal plan. It has two square shapes with stunning accuracy to qiblah as follows; i) large square site, believably the main building of the mosque and ii) smaller square site, presumably the minaret. Geographically, the identified site is located at the parking area of the current History and Ethnography Museum of Melaka.*

Research limitations - *As limitations, this study relies on: i) English translation in dealing with ancient text from Chinese and Portuguese and ii) municipal plans of colonial Melaka instead of the Sultanate period.*

Originality/value - *The research presents a strong case on precise location of Melaka Sultanate mosque subjected for further verification and reconstruction study aiming for heritage tourism that is aligned to SDG8.9 & 11.4.*

Keywords : Melaka Sultanate, Mosque of Melaka Sultanate, Melaka Sultanate City, Geo-Mapping, Reconstruction Study.

Embedding Entrepreneurial Learning in Design Project: The Conceptual of Entrepreneurships Education for Design Project

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Abstract

Background - *Entrepreneurship education has been a new approach in context aware for design subjects or programme.*

Purpose - *This paper will explore the entrepreneurship module to be embedded in the design subject.*

Design/methodology/approach - *In this study, an observation throughout the process of a design project has been used as part of solving the problem in the theme given.*

Findings - *The ideation and sketch at the starting point has been observed until the final process of creating the final art work.*

Research limitations - *The final art has been showed in the showcase arena for promoting the art work in the area of Klang Valley, Malaysia.*

Originality/value - *The scenario of entrepreneurial concept has been triggered and simulated among the students who participated in this project.*

Keywords : Design project; Entrepreneurships Education; Entrepreneurial Learning; Showcase; Art work.

Design of a Broadband Long-Range RF-Rectifier Circuit for Harvesting Ambient Energy

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Abstract

Background - *RF energy harvesting (RFEH) is a novel approach for generating direct RF power or charging and recharging of batteries using ambient electromagnetic (EM) sources. It comprises an antenna and RF-rectifier that collectively transform radio frequency (RF) signals to accessible dc sources.*

Purpose - *To design and analyze a broadband RF-rectifier that can support a wide range of RF input power in order to increase the reliability of the RFEH module.*

Design/methodology/approach - *The RFEH module proposed in this designed comprises two segments. Each segment comprises a resistance compression network (RCN), open and short-circuited impedance transformer stub linked to the rectifying diode through a series impedance transformer.*

Findings - *The proposed design frequency range from 1.78 GHz to 2.62 GHz can operate and harvest within the available RF signals of GSM-1800, UMTS-2100, ISM-2.4, and LTE-2600 spectrum bands. The impedance matching network (IMN) transformed the input impedance from a pair of a single section voltage multiplier to approximately 50 Ω. A 50 Ω transmission line (TL) connects the two broadband rectifier segments through RCN, and the circuit is terminated with 2 kΩ terminal load (RL). The proposed design realized a maximum RF-to-dc power conversion efficiency (PCE) of 76.52%, 71.9%, 68.6%, and 65.5% at the respective frequencies of 1.83 GHz, 2.10 GHz, 2.40 GHz, and 2.60 GHz for an input power of 10 dBm. The RF-rectifier realized a maximum output dc voltage (Vc) of 2.1 V for 10 dBm input power and 1.83 GHz.*

Research limitations - *The RF-rectifier is an important segment of RFEH system because of the weak ambient signal level harnessed by the antenna.*

Originality/value - *A unique technique is demonstrated in the proposed RF-rectifier design using a wideband resistance compression network (RCN). The approach enhances the circuit's matching perfromance that resulted in an improved efficiency over a wide range of input power and frequency. The RFEH module is designed using two segments. Each segment comprises an RCN, open and short-circuited impedance transformer stub linked to the rectifying diode through a series impedance transformer.*

Keywords : RF energy harvesting (RFEH), impedance matching network (IMN), resistance compression network (RCN), power conversion efficiency (PCE), broadband rectifier.

The Case of Floating Market of Melaka Sultanate

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Abstract

Background - *The fifteenth century Melaka Sultanate city is well known as a significant centre of global trade with its cosmopolitan city hosting approximately two hundred thousand of population. With such a large population of locals and traders, the kingdom was claimed to have relied heavily on imported food from the neighboring countries. There were not many critical studies done to examine the involvement of local habitants in playing their role to fulfill this great demand.*

Purpose - *This research investigates the traces of how Sultanate Melaka city was put to work and at the same time to look into the model of socio-cultural-economic of its indigenous people.*

Design/methodology/approach - *This study investigates historical text and visuals to examine the native society's involvement in producing and distributing food to the central city of Melaka Sultanate. To gain authentic data, the study examines text from ancient Malays, Chinese and Portuguese written contemporary to the Sultanate period. Finding of textual analysis was cross-referenced with analysis on archival visuals which largely deals with municipal plans of the post sultanate period. This is to trace the leftover infrastructure of the sultanate period in view of the textual analysis. The method of the study includes narrative analysis and visual anthropological analysis.*

Findings - *Fusion of both analysis proposes an alternative perspective in solving discrepancies in historical data regarding fertility of Melaka soil, agricultural activities and the participation of indigenous society in the Melaka Sultanate economy especially in serving massive demand for food. The study also suggests what appears to be a case of a floating market at the Melaka River which flows through the centre of the extinct ancient city of Melaka Sultanate.*

Research limitations - *Due to the researcher's limitations, this study relies on English translation especially in investigating ancient text from Chinese and Portuguese. In the absence of visuals of Melaka Sultanate city, the study uses municipal plans of colonial Melaka as evidence to support its case.*

Originality/value - *The finding of this research contributes a unique perspective in a reconstruction study of Melaka Sultanate. This study is envisioned to provide a strategic idea for heritage tourism that is aligned to SDG11.4 & 8.9.*

Keywords : Melaka Sultanate, Melaka River, Floating Market, Melaka Sultanate Economy

Track: Creative Multimedia

Using Multimedia Gallery Framework Components to Understand Better the Process of Designing and Developing Multimedia Gallery Spatial Layout Environment

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Abstract

Background - *Grasping the understanding of designing spatial layout environment for multimedia gallery involves understanding of the design process and implementing design ideas in architectural design sketches and 3-dimensional visualizations. In order to design the space and environment better, consideration for visitors' experience will elevate the space into an experiential designed environment with improved spatial layouts.*

Purpose - *This study focuses on designing and developing spatial layouts based on the six basic layout configurations and components of gallery affordance in the multimedia gallery framework. The objectives of this research are i) To establish architecture design process in preliminary design stage, ii) To express design ideas through 3-dimensional visualizations and iii) To assess the understanding of designing multimedia galleries.*

Design/methodology/approach - *The research methodology is conducted in three phases; phase one (preliminary design stage) confirms the architectural design process which includes design brief, site appreciation, users' needs, spatial requirements and design intention. Phase two conform the design intentions by expressing ideas in 3-dimensional visualizations while phase three assesses the understanding of designing multimedia gallery by distributing an open ended survey. In this research, Virtual Reality Design 1 students from Faculty of Creative Multimedia were guided in the preliminary design stage. They were briefed on the multimedia gallery framework and overall design process, shown examples of multimedia gallery designs and underwent several critique sessions. The final design was finalized from a selection of alternatives and materialized in 3-dimensional visualization images and walk-through video. An open ended survey was distributed to the students after they have completed their final design. In this survey, thoughts and ideas of their concept and design were collected and processed.*

Findings - *Findings from the survey contribute to the process of designing and developing multimedia galleries by investigating design students' understanding of visitors' experience in their design.*

Research limitations - *This research is conducted and limited to a group of semester one virtual reality students. The visualizations are also created based on basic knowledge of 3-dimensional tools and devices.*

Originality/value - *Significance of this study will benefit design students, artists and curators of the built environment and establishes ground for future works in experiencing multimedia galleries using various visualization tools.*

Keywords : multimedia gallery, multimedia gallery framework, architecture design process, visitors' experience, 3-dimensional tools

A qualitative study of Online Gamified Learning for Recycling Intention

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Abstract

Background - *Recycling is a way to sustain the ecosystem of the environment. There are substantial studies on recycling intention due to the continual growth of unethical and unmanageable waste disposal. Creative approach of recycling awareness activities should be created for fulfilling the increasing demand of interest by the youths.*

Purpose - *The main objective is to explore the factors of recycling intention of the youth after experiencing a gamified recycling learning activity, namely Edcraft Gamified Learning (EGL). Recycling education in a gamified way is believed to be a practical and engaging approach for youths.*

Design/methodology/approach - *One hundred students participated in EGL, consisting of two plastic craft recycling activities. After experiencing the online EGL at home during the COVID-19 pandemic, 29 participants were purposively selected to participate in five (5) focus group discussions (FGD) with 5-8 participants per session to explore their opinions towards gamified learning, motivation, and recycling intention. Thematic analysis was conducted based on the transcribed FGD. A codebook was developed based on the codes from the feedback of the FGD. The codes from the codebook were rated by two raters, followed by the assessment of interrater reliability.*

Findings - *The findings emerged with four themes as the factors to influence recycling intention. They are accomplishment, rewarding, social influence and fun learning. The full paper will explain about these findings, evidenced by the youths' experiences during the FGD sessions.*

Research limitations - *The qualitative data gathered after the youths experiencing only two levels of gamified learning experience due to the time limit.*

Originality/value - *Factors influencing recycling intention among youths were explored within a gamified learning environment through qualitative approach.*

Keywords : Recycling intention, Gamified learning, Focus group discussion, Interrater reliability, Edcraft

REINVENTING THE CONTEXTUALIZE KELANTANESE WAYANG KULIT PERFORMANCE

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Abstract

Background - *This paper is meant to outline the creative framework in developing a conceptual time-based visual art real-time performance entitled: The Beringin Project: a new format to Kelantanese Wayang Kulit. The project establishes multiple mediated visual assets and components, performed real-time alongside a 'Tukang karut' synergized by 'media jockey' to create a new experience in delivering an accustomed tradition that ceases to exist in popularity.*

Purpose - *The project sets to challenge how conventional cultural performance can be elevated to meet the digital capability and advancement while keeping the integrity of traditional representational elements? Through the experimental performance, both perceptive and auditory components are projected on a different plane surrounding an area, queued to the narration; the core mediated components established are One (1), the perceptive elements that include motion graphics, 3D animation, spatial turnaround, constructing the representational gap explaining: the character, the environment in simulating narrative events; and Two (2) is the auditory aspect that includes audio design and modernizes background music. Whilst the story is being told through conventional live performance, the visuals and sounds help shape audience reaction and position meaning to the words by assembling the components, filling up the gaps thus creates a new visual vocabulary to the 'formal' tradition of Wayang Kulit performance.*

Design/methodology/approach - *The paper will discuss the creative approach and considerations by poising a mediated semiotic representation of 'Kelantanese Wayang Kulit' adhere to the once celebrated culture and traditions based on traditional, evolve and constructivist grounded theory, serve as a basic framework of the conceptual visualization.*

Findings - *The research will outline a mediated framework involved through the different models of visual components involved as a constructive experiential meaning-making feature to the traditional performance.*

Research limitations - *The discussion limits to the mediated visual vocabulary established in service to the authentic traditional narratives of a live Kelantanese Wayang Kulit Performance.*

Originality/value - *The outline of the process put together will serve as a support tool for real-time visual artists, potential to articulate more discussion on visual approach looking into the correlation between the definition and practicality.*

Keywords : Keywords: Cultural semiotics, experiential design, contextual representation, conceptual design, cultural performance.

Exploring eHealth model and its acceptance for mental wellness among digital talents

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Abstract

Background - *Many digital talents are facing general health and mental health issues in this uncertain time. Their roles are crucial as the main workforce for accelerating digital transformation. Even before the COVID-19 pandemic hits, many Malaysians are facing health challenges due to the high prevalence of non-communicable diseases. The health issues among digital talents are expected to worsen due to the effects of stress and sedentary lifestyles during movement control orders. In the digital era, eHealth applications such as MySejahtera, and various health related applications and contents, etc are potentially effective for promoting health to them.*

Purpose - *The objectives are two-folds: 1) To conduct a critical review on how eHealth models that can facilitate health promoting behaviours, particularly on mental health, 2) To explore the use of eHealth and its acceptance by digital talents in an ICT/multimedia based university in Malaysia.*

Design/methodology/approach - *This research utilizes a mixed method of critical literature review with a survey research participated by forty-one digital talents who play some key roles in providing digital skills at tertiary education level.*

Findings - *The outcome of the study informed that Shaw's eHealth model is more suited for guiding research on acceptance for mental wellness. The model is simple, up-to-date and general for public. The findings show that a majority of them agreed that eHealth is appropriate to manage mental wellness and they would want to use it. Among the three eHealth domains, the acceptance level is the highest for the application domain of "interacting for health" and the talents are more likely to accept the use of "interacting for health", in relations to mental wellness applications.*

Research limitations - *This study focuses on eHealth for mental wellness perspective, and conducted a small scale survey on digital talents. Future study will conduct a larger scale of survey to reach more digital talents in Malaysia.*

Originality/value - *This study address the gap of research on eHealth view by digital talents for their acceptance and collective view on using digital health / tools / platform in promoting their health.*

Keywords : eHealth model, digital talents, mental wellness, acceptance

A Study of Students' Satisfaction of Asynchronous Online Learning in Oman

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Abstract

Background - *Due to the development incurred by nowadays technology, the world has become a small village with instantly changing methods of education. Online education, thus, has become an alternative method for course delivery used by colleges and universities all over the globe.*

Purpose - *To determine the students' satisfaction with asynchronous online learning as well as the relationships between students' satisfaction with asynchronous online learning and student-instructor and student-peer interaction.*

Design/methodology/approach - *there were 564 students enrolled in asynchronous online learning at College of Sharia Sciences in the Sultanate of Oman for the academic year 2020-2021. The survey instruments adapted from "The Student Satisfaction Survey" (Strachota, 2006) was utilized in this study. The first part of survey is a demographics section. Second part of survey is learner-instructors' interaction; third part is learner-peers' interaction, and last part is general satisfaction.*

Findings - *There is no direct effect between demographic factors and student satisfaction with asynchronous online learning. However, there is a strong and noticeable effect between students' satisfaction with asynchronous online learning and student-instructor interaction. There is also a correlation between students' satisfaction with asynchronous online learning and student-peer interaction. The students of the College of Sharia Sciences are satisfied with asynchronous online learning; they considered it a very good experience and recommend its use by students in other educational institutions.*

Research limitations - *The researcher faced difficulty in choosing the target group due to the adoption of asynchronous online learning in one university only in the Sultanate of Oman.*

Originality/value - *This study will serve to be a reference for the College of Sharia Sciences in particular and higher education institutions in the Sultanate of Oman in general regarding the benefit of online learning. The results this study yields will also enable faculty members limand administrators in the College of Sharia Sciences to enhance students' satisfaction with the online learning environment, which leads to improving the retention of students to study online in the college.*

Keywords : Asynchronous Online Learning, Students' Satisfaction

Application of Instructional Design Towards the Creation of Multimodal Micro-credential Upskilling Modules

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Abstract

Background - *Multimedia content designers are expected to be capable of addressing the educational needs of working adults. Micro-credential, defined as the certification of mastering specific knowledge or skill affords its learners accessibility and convenience. With increased use of diverse multimodal forms for learning and the need for information delivery in smaller portions, micro-credentials are becoming essential for adult training. It is pertinent to study how instructional designers, together with subject matter experts, adapt academic formal learning methods and contents into adult training environments as multimodal micro-credential modules.*

Purpose - *The purpose of this study is to explain the instructional design process involved in applying micro-learning techniques for adults' upskilling training since there are research gaps about the instructional process of micro-credential module creation for adult training. This study aimed to understand the instructional design experiences of instructional designers and subject matter experts; therefore a qualitative research plan consisting of focus groups and semi-structured interviews, was considered appropriate.*

Design/methodology/approach - *Thematic analysis of the transcribed responses from the focus groups demonstrated the respondents' instructional design experiences including the challenges and effectiveness of applying micro-learning techniques for multimodal content creation.*

Findings - *The data indicated that properly designed micro-learning materials provided learners access to authentic learning contents, and emphasised the critical role of applying instructional design models to create micro-credentials for upskilling adult training. The use of instructional design models, focusing on the needs of adult learners, enabled the design of relevant micro-credentials for upskilling training. The respondents, however, acknowledged the complexities of correctly matching the topics to the micro-credential learning outcomes which should align with the objectives of the overall course.*

Research limitations - *Data was collected from two focus groups, comprising three instructional designers and six subject matter experts, which produced detailed information about their instructional design experiences. The research results are limited by the sample size and could not be generalised to reflect the experiences of other instructional designers and subject matter experts.*

Originality/value - *The results of this study is valuable towards contributing to the knowledge base of instructional design processes, especially for micro-credentials design and development and identifies the practical implications for the instructional designer's and subject matter expert's tasks.*

Keywords : multimodal, micro-credential, micro-learning, instructional design, adult training

Utilizing Augmented Reality for Science Learning Experience

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Abstract

Background - *Augmented Reality (AR) is growing to become a major tremendously immersive technology that applies to different fields and purposes. In addition, Augmented Reality has made a significant contribution to advanced learning in recent years. Learning Science subject in traditional learning, otherwise known as classroom-based learning, is heavily dependent on the system implemented in the school syllabus Traditional learning is often accompanied by many challenges and it always plays a role in the old way and puts a little bit of pressure on this digital world. The issues in the field of science subject are the availability of appropriate textbooks and classroom resources for the students that can enhance the learning experience of the students.*

Purpose - *This paper deals with the development and implementation of mobile Augmented Reality (AR) applications for Science learning. The selected chapter is learning from a Science subject in primary school. This application is built with a different way to present information to the students in the form of three-dimensional modeling and animation images by using a tracking device through a smartphone's camera. The mobile Augmented Reality (AR) technology will be developed that could potentially enhance the user experience for all users especially focus on individual learning experiences with self-study product and making Science subject learning easier.*

Design/methodology/approach - *A pilot test was carried out on 35 students to analyze the individual learning experience of the developed prototype application for science learning. First, the brief or tutorials on how to use the prototype was provided. The application will be tested to ensure that it objective of the project is achieved, the prototype of VAT it can function properly in terms of the delivery platform selected, so that it can be used and also meet the needs of the target. User learning experience will be observed. The students were able to give an opinion and feedback through the survey distributed.*

Findings - *From the result, the use of application prototypes in terms of user learning experience, blended learning experience, and online learning is realized and developed as a factor influencing the use of Augmented Reality for Science subject learning.*

Research limitations - *This study only addresses the qualitative approach of utilizing augmented reality for a learning experience which involves the collection and analysis of data for statistical analysis framework that includes numerical for statistical analysis.*

Originality/value - *Enhance the user experience for all users especially focus on individual learning experience with self-study product, online and blended learning, and making Science subject learning easier.*

Keywords : Augmented Reality, Science, Learning, Smartphones

Sonification of Weather Data as a Non-human-centric Artistic Approach

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Abstract

Background - *In the mid-20s century, the emergence of sound studies demonstrated the shift of research interest in sonic practitioners. This field gain its prevalence by expanding the boundaries of prevailing conception through proposing alternative creative approaches in sound art practices.*

Purpose - *As a purpose to examine the major tropes in sound studies, this research addressed nonhuman theoretical aspects by presenting non-anthropogenic sounds elements such as weather data and environmental sound as one of the approaches in sound practice that contradicts with the conventional conception of agential relation between human and non-human entities.*

Design/methodology/approach - *Here, we present a sonification system that was designed in pure data to promote creative sound making. The system converts weather data into bytes and then into sonic parameters. The system practicalized common techniques of electronic music such as synthesis in the process of sequencing and mapping the data to sonic parameters.*

Findings - *We reflected on how to create sonic work that addresses the interconnectedness of listening and sounding. In the course of listening, each non-anthropogenic element was discovered as distinctive to one another regardless on its audibility, thus the sonification system serve as an epiphenomenon of the listening approach. The sonification reveals the analogical connection in between weather data and sonic parameters, as such, the rise of temperature corresponds to higher frequencies in sound. Besides that, sonification enables the sensible realm of weather data to be revealed in specific temporal scale through the sequencing of sonic parameters, in this sense the data relates to the tone or mood of the sound. For example, the status of overcast cloud will result in the 'darkening' of a sonic tone.*

Research limitations - *the scope of the research only emphasizes on specific tropes of nonhuman theories thus ignoring others that are widely discussed.*

Originality/value - *Through the weather data sonic production, we have attempted to show how this approach can dismantle human-centered worldview by incorporating tropes of sound studies, all of which eventually come together to define and reinforce the non-human-centric paradigm in sound practice. The research proposes alternative perspective in representing collaborative connection between human and nonhuman entities to foster imagination and creativity*

Keywords : non-human-centric, non-anthropogenic elements, sonification, sonic design, weather data

Using Mixed Reality to Improve Learning Experience of Entomology Students

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Abstract

Background - *Virtual learning in education is a potential learning environment in providing a highly engaging and effective learning experience for learners. Virtual Learning technologies such as Mixed Reality can help learners to enrich learning experience to be more effective.*

Purpose - *The aim of this paper is to study about the implementation of virtual learning based on the study of the characteristics and the behavior traits of bees in entomology course.*

Design/methodology/approach - *The scope of this study will be focused on students of Depatment of Entomology and Pathology - University College Of Abureyhan, University Of Tehran, who take Insect Diversity & Classification subject in trimester 2 - 2017-2018.The study is conducted by integrating the clinical skills-VLE into the study of entomology in order to enhance the learning about the bee's physical characteristics, behavioral traits, examining the displays, tracking techniques, the reaction towards technology and also to determine the effectiveness of online environments in teaching entomology. In this research, learning about insects is emphasized as the learning content in the Virtual Learning environment. To be more specific, this research tries to do research on identifying Meliponine honeybees from other types of bees by using the Virtual Learning technologies.*

Findings - *The results showed significant changes based on the knowledge exposure to the online environment. The results also showed that understudies the worked virtual learning presented in the entomology studies that were modeled after the four phases of experimental learning did show some significant changes in learning than those that did not. Besides that, the results revealed that the learning session such as lectures, tutorials and the laboratory practices should be considered first, before determining the types of mixed reality technology used in such learning environment.*

Research limitations - *However, this study limited to the nonattendance of a connection gathering. In the future study, it is suggested to have a relationship gathering and a preliminary cluster with an N that gives perfect quantifiable structure.*

Originality/value - *Implementing mixed reality learning environment in entomology course had offered potential solutions to overcome the current teaching and learning problems.*

Keywords : Virtual Learning Environment, enhance learning, online entomology learning, mixed reality

Track: User Experience Design

Perceptions and Learning Evaluation of a Non-immersive Virtual Reality Application for Children with Autism Spectrum Disorder

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Abstract

Background - *Autism Spectrum Disorder (ASD) is a type of complex development condition that involves persistent challenges in social interaction, speech and nonverbal communication and repetitive or restrictive behaviors. Children with autism spectrum disorder are progressively acquainted with information and communication technologies (ICT) in their training and diagnosis. One of the ICT areas, namely non-immersive virtual reality (NIVR), has become a noticeable tool to help children with ASD in their social training and provides extensive interaction, economical cost, safe environment and an enjoyable experience.*

Purpose - *An NIVR application has been developed to assist in the intervention on children of ASD. However, the whole experiences of the training need to be validated in order to conclude its effectiveness.*

Design/methodology/approach - *We conducted an evaluation to determine the effectiveness of NIVR application by using Kirkpatrick model of evaluation. Mixed research methodology is employed with qualitative and quantitative data sources in which purposive sampling is used in detecting cases who would eventually become the research participants. The evaluation is executed via online questionnaires, interview, pre- and post-test. The main objectives of this research are to evaluate Level 1 and Level 2 of Kirkpatrick model respectively. The target for Level 1 is to assess on how children react to the NIVR application by asking questions that establishes the children's thoughts. Level 2 is to gauge whether participants have developed the knowledge, confidence or mindset in order to know what they have learnt. Level 2 covers the evaluation prior to the training (pre-test) and after the training (post-test).*

Findings - *Based on the evaluation on Level 1 and 2 of Kirkpatrick Model, on average the children of ASD had a good experience and able to improve their social skills with the NIVR application. Based on this conclusion, the combination of serious game, analytics and specific VR type provide a better data assessment, facilitate a comfortable training environment and can be an effective intervention for children with ASD.*

Research limitations - *Limited number of research participants that could be obtained due to the current pandemic situation.*

Originality/value - *The use of NIVR is still scarce in helping children with ASD in their social training.*

Keywords : Autism Spectrum Disorder, non-immersive virtual reality application, training evaluation, Kirkpatrick model

Rapid Prototyping in The Era of Covid-19 In Malaysia

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[1]Multimedia University

Abstract

Background - *Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has emerged from Wuhan City in Hubei Province, China on 11 March 2020 and spreding to all over the world. Know as "corona virus disease 2019" (Covid-19), this deseased finally being declared by World Health Organization (WHO) a global pandemic on 11 March 2020. Covid-19 can be highly transmitted via close-contact and respiratory droplets [Bao et al, 2020] has pushed the frontliner (healthcare staff, safety officer and essential worker) to wear personal protective equipment (PPE) resulting the shortage of ppe all over the world. To coupe with the shortage, a face shield is being produce by alternative production method called Rapid Prototyping (RP). RP involving solid freeform fabrication (SFF) represents a range of additive (layer) manufacturing concepts where a computer-generated model or computer-aided design (CAD) file format is converted (or decomposed) into individual, oriented, horizontal layers thin layers and being laid on top of each other to form a solid object.*

Purpose - *this paper presents the alternative process of producing face shields using fused deposition modelling (FDM) technology and user-centered evaluation of the mask itself.*

Design/methodology/approach - *The 3D file for the face shield was obtained from an online portal then redesigned to be more comfortable, sliced by Cura software, 3D printed using Ultimaker 2+, and the finishing includes attaching a transparent PVC rigid sheet with holes punched along its side. This faceshield then being given to 6 frontliner personals (doctor, nurse, guard, a police officer, food delivery staff and ehailing driver) to be worn for 5 days during their working hours. Their feedback in term of quality of work, respiratory issues and skin comfort were recorded and being tabled.*

Findings - *Based on the positive results obtained, a quickly fabricated and low-cost solution, this face shield proved to be feasible to be used for Malaysian front liners in their daily work routine facing the thread of Covid-19.*

Research limitations - *Only 6 samples collected.*

Originality/value - *This paper may help and guide the three dimensional (3d) printing community to contribute the 3d printed face shield effectively.*

Keywords : Covid-19, rapid prototyping, 3d printing, face shield, frontliner

Co-Shaping for Social Impact: The PIBKS#PBL@Sekolah Initiative Experience

Natalya Rudina Shamsuar[1], Hanafizan Hussain[2]

[1,2]Multimedia University

Abstract

Background - *This paper discusses the experience of amalgamating multiple stake-holders engagement in conceiving and delivering a program intended to transform the mindsets in preparing the young generation for the future. This initiative had impacted 146 schools in Kuala Lumpur, Malaysia.*

Purpose - *The paper further elaborates the knowledge creation process in co-developing this program.*

Design/methodology/approach - *In this action research, the Quintuple Innovation Helix Model is used as the anchor to describe the interrelations between the various sub-systems surrounding the school-going children.*

Findings - *A design canvas termed PIBKS#PBL@Sekolah is constructed as a tool to integrate various functional roles of the four main stakeholders namely academia, government, industry and society.*

Research limitations - *This program is situated within the environmental context of future proofing the young generation. As an approach to sustainability, the program design has embedded replicability and scalability as part of the process.*

Originality/value - *Social impact measures rubric is designed in parallel to the program design canvas.*

Keywords : co-shaping, social impact, stakeholder engagement, quintuple helix.

An Approach Towards A Paradigm Shift in Adaptive Character Design for Ambient Learning Environments

Md Najib Osman[1], Hanafizan Hussain[2], Sri Kusuma Wati Mohd Daud[3]

[1,2,3]Multimedia University

Abstract

Background - *This study has been derived from the students' perceptions and preferences in designing avatar for higher learning.*

Purpose - *This paper will elaborate the approach of paradigm shift in designing character for ambient learning environments.*

Design/methodology/approach - *This study will utilize the approach of adaptive character design in ambient learning will become a paradigm shift in creating character for e-learning environments.*

Findings - *The findings has been categorised as one of the experience creations in the character design for ambient learning environments.*

Research limitations - *Additionally, the character design which is based on the students' preference has been analysed and use as the interest in the fundamental taxonomy in describing the ambient learning for the e-learning environments.*

Originality/value - *By this approach, it can be of interest to creative content developers of adaptive and context aware applications.*

Keywords : Paradigm shift; Character design; Ambient learning; E-Learning materials; Creative content developers

Track: Visual Arts

Intelligible Approach to Using the ‘Art and Design Analysis' of Form, Content and Context

Khairun Niza Mohammad Radzi[1]

[1]Multimedia University

Abstract

Background - *The task of structuring an analysis would sometimes be quite cumbersome for a design student without a proper background knowledge. Often in class, a student can come-out with a commendable design work but would be hard-pressed trying to explain the concept of the design. This could be attributed to the lack of an in-depth understanding of the subject, wild-assumption of its content, or certain fear of under-achieving of a solution.*

Purpose - *The aims of this approach is to simply educate and expose skill-based students to a simple way of analysis so that they would be able to communicate efficiently of their thoughts and ideas into writing and for better presentation of their works.*

Design/methodology/approach - *This study explores approach to design analysis using an easy formula of galvanizing ‘form, content and context' in the settings of an art appreciation class - to better equipped a student with a more objective observation from several perspectives of design sensibilities. Starting from observing to recognizing the ‘form', the ‘content' and subsequently the ‘context' in every stages of the design process helps build a solid foundation to a workable design solution, ultimately garnering a wealth of design possibilities.*

Findings - *The result of the effectiveness of this approach reflected through their writings. A student with this insight would be in a better position to meet the requirements of formulating data and research developments as an additional set of skills to their current majoring.*

Research limitations - *This study shall covers the use of 'Form, Content and Context' as a formula on analysis writing in the settings of Art Appreciation class within the year of 2020*

Originality/value - *Even-though the theory/formula of 'Form, Content and Context' is widely use either in literature, design or etc., the impact that this formula brings to a design-based students are limitless as this study also see the importance of both linear and the non-linear gathering of information, a step-by-step guideline from the inception to the closure of the final result*

Keywords : knowledge, understanding, experience, semiotics and semantics, emphatic solution

Beyond Taxonomy: Art Collection in the Realm of Instantaneous Connectivity

Roopesh Sitharan[1]

[1]Multimedia University

Abstract

Background - *The act of collecting art objects is axiomatic to a particular value held by the person collecting. Essentially this value dictates the way in which art objects are ordered within a collection. This is the reason why the taxonomy shaped by the subjective reasoning of the collector becomes crucial for an exhibition as it provides the much needed rational for a collection. While this highlights the importance of taxonomy as a necessary key to access an art collection, it simultaneously poses significant restriction to the way in which a collection could be exhibited.*

Purpose - *This paper explores the significance of online exhibition, in particular the curatorial inquisition and decolonial theories in presenting and shaping the discourse on private art collection in Malaysia.*

Design/methodology/approach - *This paper examines this restriction through a curatorial project called Object Matters: emancipating the collection of Rahime Harun. Specifically, it uses a narrative method that constitute a phenomenological account of curating to meticulously analyze the experience of curating a collection via online platform.*

Findings - *Building upon the proposition by prominent Malaysian-net artist, Niranjan Rajah where he argues for a "revolutionary ontology for art" caused by the ebbing of site specificity in installation art when presented online - this paper looks at the curatorial strategies implemented in the virtual exhibition of Rahime Harun collection as plenitude for experiences rather than classification of knowledge.*

Research limitations - *This is achieved by having a practice led research that recognizes emergence form of knowledge. Crucially it allows a practitioner to reflect the messy world of curatorial practice as opposed to the relatively controlled and uncluttered ways of observational research.*

Originality/value - *The central value for this paper is probing the relevancy of Niranjan's theoretical proposition for Malaysian art by examining the curator's experience in curating an art collection for online experience.*

Keywords : Virtual Exhibition, art collection, curatorial practice, online media

Aesthetics of Data Objectification by Artificial Intelligence

Mohd Hafizuddin Mohd Yusof[1]

[1]Multimedia University

Abstract

Background - *This paper provides an overview of an art project that attempts to visualize the objectification process of subjective data by Artificial intelligence (AI). The rapid acceleration of computing capabilities in recent years forged the creation of autonomous machines built on techniques and technologies of algorithmic quantification that is believed to be free from human perspective and biases.*

Purpose - *Having this as the basis, the project investigates such neutrality by making the AI to interpret art objects using machine learning. Specifically, by having the AI to study 2425 works of Malaysian paintings that was officially auctioned for the past 10 years, the project aims to explore the quantification process of a highly contextual work of art with varied, subjective interpretations. This is achieved by having the AI to look at 2048 specific points in a painting and corresponding these points with three colour cluster, namely RGB using deep learning algorithm.*

Design/methodology/approach - *2425 works of Malaysian paintings that was officially auctioned for the past 10 years were extracted from catalogues. Quantification process was achieved by having AI to look at 2048 specific points in a painting and corresponding these points with three colour cluster, namely RGB using deep learning algorithm.*

Findings - *The analysis is then visualized in a form of square and spiral color-coded mosaics. These mosaics are then juxtaposed with the corresponding monetary value of painting in which it was derived from.*

Research limitations - *Only 2425 art works were collected for the past ten years. More numbers could have produced better results.*

Originality/value - *The data were extracted from original Malaysian art works that have been officially auctioned for the past ten years. Crucially this research on AI is approached as an artistic inquisition in order to dethrone these novel intelligent technologies as solely a product of computer science but additionally as a new form of agency with intense cognition capabilities that are deemed to be neutral, highly structured and complex with universal appeal while truncating subjective thoughts and humanistic expression.*

Keywords : Subjectivity, Subjective Data, Machine Learning, Artificial Intelligent (AI), Image Analytics

Reconstruction Studies of the Street Market of Melaka Sultanate

Fauzan Mustaffa[1], Muhd Fauzi Othman[2]

[1]Faculty of Creative Multimedia, Multimedia University, [2]Faculty of Social Science and Humanities, Universiti Teknologi Malaysia

Abstract

Background - *The rise of Melaka Sultanate as an 'emporium' and a centre of international trade in the fifteenth and early sixteenth centuries has been discussed by many scholars. The trading town including the street market of Melaka Sultanate has gone through a long evolution in its historical narrative since its first ruler, Sultan Megat Iskandar Syah. The potential and development of the trading history of the town began with the emergence of the entrepreneurial society spin-off by the local inhabitants and enlarged by the participation of foreign merchants. However, less critical study has been carried out to visualise the street market of this trading town.*

Purpose - *This study investigates historical records in its attempt to make an interpretative reconstruction of the street market.*

Design/methodology/approach - *This research is shaped by the nature of exploratory research; a study which attains its understanding by collecting, examining, analysing and assembling 'relevant puzzles' into the mix based on the historical record as underlying reasons in building its case on the tradition of Sultanate Melaka municipality. Data collection in the research involves archival materials focusing on descriptive clues from historical text written contemporary to the Sultanate period and historical visuals of which were produced after the Sultanate period. The researcher cross-references his analysis on archival visuals namely cartographic materials, municipal plans and artist impressions with narrative accounts from the ancient Malays, Chinese, and Portuguese. The study employs narrative analysis, visual anthropological analysis and design process in pursuing its objectives. Based on findings of narrative analysis and traceable municipal structure and elements of Sultanate tradition embedded in Portuguese Melaka municipal plans, this study built its case on the street market of Melaka Sultanate.*

Findings - *The finding suggests a set of criteria which lead to a three-dimensional interpretative reconstruction of the street market of Melaka Sultanate that best fits the idealism of the study.*

Research limitations - *Due to language limitation, this study rely on English translation especially in studying ancient text from Chinese and Portuguese.*

Originality/value - *The research contributes to a reconstruction study of the street market of Melaka Sultanate in view of heritage tourism that is align to SDG11.4 & 8.9.*

Keywords : Melaka Sultanate, Melaka Sultanate Trading Town, Street Market of Melaka Sultanate.

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CITIC 2021

International Conference on Computing, Information Technology and Intelligent Computing

Virtual Conference
June 21-23, 2021

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CONFERENCE CHAIR MESSAGE

We are delighted to welcome you to International The 1st International Conference on Computer, Information Technology and Intelligent Computing (CITIC 2021) by Multimedia University (MMU), Research Synergy Foundation (RSF), and Canadian University, Dubai (CUD) that held virtually on June 21-23, 2021.

The 1st International Conference on Computer, Information Technology and Intelligent Computing (CITIC 2021) will be held on 21st – 23rd June 2021 virtually. This conference is being co-organized by Faculty of Computing & Informatics (FCI) and Faculty of Information Science Technology (FIST), Multimedia University.

CITIC 2021 aims to bring together leading academic scientists, researchers and research scholars to exchange and share their experiences and research results on all aspects of Frontiers in Computer, Information Technology and Intelligent Computing. It also provides a premier interdisciplinary platform for researchers, practitioners and educators to present and discuss the most recent innovations, trends, and concerns as well as practical challenges encountered and solutions adopted in the fields of Computer, Information Technology and Intelligent Computing.

It has been our privilege to convene this conference. Our sincere thanks, to the conference organizing committee; to the Program Chairs for their wise advice and brilliant suggestion on organizing the technical program and to the Program Committee for their through and timely reviewing of the papers. Recognition should go to the Local Organizing Committee members who have all worked extremely hard for the details of important aspects of the conference programs and social activities.

We welcome you to this conference and hope that this year's conference will challenge and inspire you, and result in new knowledge, collaborations, and friendships.

Best regards,

Assoc. Prof. Dr. Haw Su Cheng

CITIC Conference Chair

CONFERENCE CHAIR

Assoc. Prof. Dr. Haw Su Cheng

Su-Cheng Haw is Associate Professor at Faculty of Computing and Informatics, Multimedia University, where she leads several funded researches on the XML databases. Her research interests include XML databases, query optimization, database tuning, data modeling, data management, and data warehousing. She has published around 90 articles in reputable journals and conferences.

She serves in several editorial boards and participated as technical committee member and reviewer boards for several international conferences and journals. Besides, she also received several ad-hoc invitations to review journal/conference articles.

KEYNOTE SPEAKER

ASSOC. PROF. DR. RAJKUMAR KANNAN

Dean - International Relations, Associate Professor
Bishop Heber College (Autonomous), India

PROF. DR. LEE CHIEN SING

Department of Computing and Information Systems

Sunway University, Malaysia

SESSION CHAIRS

Ts. Dr. Ooi Shih Yin

Ooi Shih Yin received the Bachelor of Information Technology (Hons), Master of Science (Information Technology), and PhD (Information Technology) from the Multimedia University, Malaysia, in 2017. From 2018 to 2019, she was a research fellow with the School of Electrical and Electronic Engineering, College of Engineering, Yonsei University, South Korea. She is currently served as a Deputy Director of Technology Transfer Office at Multimedia University, Malaysia. She is the author of more than 50 articles, and more than 10 inventions. Her research interests include temporal classification, tree-based algorithms, and machine learning applications in the field of biometrics and cybersecurity.

Assoc. Prof. Ts. Dr. Pang Ying Han

Dr. Pang has about 15 years research experiences in the area of biometrics security. Throughout the years, she is actively participating in many research activities. As a dynamic researcher, she has involved in a number of scholastic activities such as being international journal editorial board member, ISI-indexed journal reviewer, technical track chair, technical program committee of many international conferences and organizer of Special Session in international conferences.
In addition, Dr. Pang has secured a good amount of funding from various external agencies such as FRGS from MOHE and TM R&D from Telekom Malaysia as well as UM-MMU collaboration from University Malaya. Under these research grants, she is working closely with abroad scientist in R&D activity as well as active in postgraduate supervision. She has several active postgraduate students. On top of that, Dr. Pang has published good quality papers in well-known indexed journals. Her research works have been cited widely in the related research community.
Furthermore, Dr. Pang has participated and received medals in several competitions/exhibitions such as ITEX, Korea Invention Academy (KIA) Special Award (Korea), PECIPTA or PERSIDANGAN DAN ESKPO CIPTAAN INSTITUSI PENGAJIAN TINGGI ANTARABANGSA, PERINTIS, RICES, Infineon Week and etc.

Dr. Ihtiram Raza Khan , Ph.D(Computer Science)

Have a total experience of 24+ years at university level in the field of teaching at UG/PG level. Currently working as an Associate Professor in Department of Computer Science, Faculty of Engineering and Technology, Jamia Hamdard, New Delhi since October 2006. And heading the placement wing of Jamia Hamdard, Computer Science department.

Assoc. Prof. Ts. Dr. Ong Thian Song

THIAN SONG ONG (Senior Member, IEEE) received the M.Sc. degree from The University of Sunderland, U.K., in 2001, and the Ph.D. degree from Multimedia University, Malaysia, in 2007. He is currently an Associate Professor with the Faculty of Information Science and Technology, Multimedia University. He has published more than 60 international refereed journals and conference papers. His research interests include data analytics, machine learning, and biometric security. He has been invited to serve as Technical Programme Committee of more than 30 international conferences and also as Reviewer for various journals. He has served as an Editorial Board Member for IEEE Biometric Council Newsletter from 2013 to 2015. He has also been the principal investigator of several government funded projects related to biometric security and machine learning research.

Dr.Reshma V. K. A Ph.D.

Dr.Reshma V. K. A Ph.D. recipient, in Information and Computer Engineering, from Noorul Islam Centre for Higher Education in 2021, Master of Engineering in Software Engineering in 2012 from Sri Ramakrishna Engineering College, Coimbatore, Bachelor of Technology in Information Technology in 2010 from P.S.R Engineering College, Sivakasi, both affiliated to Anna University Chennai. Her area of interest is Image Processing, Steganography, Neural Networks, and Machine Learning. Dr.Reshma has contributed 20+ technical papers in SCI/SCOPUS and other International journals and 10+ papers in various international conferences. Dr.Reshma has published more than 5 patents in her field of Expertise and also focused on Multidisciplinary areas. Currently Acting as Reviewer, Editor in Various Journals and Conferences. Dr.Reshma is presently working as an Assistant Professor in the Department of Computer Science and Engineering in Jawaharlal College of Engineering and Technology, Lakkidi, Palakkad, Kerala, India.

TS. DR. NG HU

Ng Hu received Doctor of Philosophy (PhD) degree from Multimedia University, Malaysia in January 2015. He is currently a lecturer in the Faculty of Computing and Informatics, Multimedia University, Malaysia. His research interests include biometrics, gait analysis, pattern recognition and machine learning. His PhD study involves other areas such as image processing features selection and classification techniques applied in gait recognition system.

ASSOC. PROF. TS. DR. MD. SHOHEL SAYEED

Dr. Shohel has more than 25 years meritorious working experience and he holds a challenging career which combines research, versatile administration and excellent teaching.

His core research interest is in the area of Biometrics, big data, cloud computing, artificial intelligence, information security, image and signal processing, pattern recognition and classification. He has published over 60 research papers in international peer-reviewed journals and international conference proceedings as a result of his research work. His research works have been published by high ranked peer- reviewed journals such as IEEE Transactions on Pattern Analysis and Machine Intelligence (TPAMI), International Journal of Pattern Recognition and Artificial Intelligence (IJPRI), Expert Systems with Applications, Discrete Dynamics in Nature and Society (DDNS) as well as several peer- reviewed International journals. Several of his findings have been presented in a number of well recognized IEEE conferences as well. He has been appointed technical paper reviewer for Journal of Pattern Recognition Letters, IEEE Transaction on Neural Networks, IEEE Transactions on Automation Science and Engineering, Journal of Computer Methods and Programs in Biomedicine and International Journal of Computer Theory and Engineering. He has also been invited to review technical papers for several international conferences. In recognition of his professional contribution, he has obtained recognition as a Senior member of IEEE Computer Society, IEEE Communication Society and International Association of Computer Science and Information Technology (IACSIT).

Dr. Shohel has invited as a Chief Guest and keynote speaker at the second International Conference on Advanced Computing (ICAC 2019). Apart from the ICAC 2019, Dr. Shohel was also invited as the keynote speaker for several international conferences such as the International Conference on Recent Trends and Challenges in Healthcare Informatics (RCHI-2019), International Conference on Recent Trends in Advanced Computing (ICRTAC 2019) and International Conference on Computational Intelligence and Applications (lCCIA 2019). Furthermore, Dr. Shohel was also invited as the keynote speaker for the International Conference on Modern Research (Multidisciplinary) 2019, International Conference on Advanced Computing (ICAC 2015), International Symposium Innovative Management, Information & Production (IMIP 2015) and International Conference on Innovations in Computer Science and Technology (ICICST 2016), respectively.

D Dr. Ahmed A. Elngar (Ph.D)

Dr. Ahmed A. Elngar is Associate Professor of Computer Science at the Faculty of Computers and Artificial Intelligence, Beni-Suef University, Egypt. Dr. Elngar is the Founder and Head of Scientific Innovation Research Group (SIRG). Dr. Elngar is a Director of the Technological and Informatics Studies Center (TISC), Faculty of Computers and Artificial Intelligence, Beni-Suef University. Dr. Elngar has more than 55 scientific research papers published in prestigious international journals and over 25 books covering such diverse topics as data mining, intelligent systems, social networks and smart environment. Dr. Elngar is a collaborative researcher is a member in Egyptian Mathematical Society (EMS) and International Rough Set Society (IRSS). His other research areas include Internet of Things (IoT), Network Security, Intrusion Detection, Machine Learning, Data Mining, Artificial Intelligence. Big Data, Authentication, Cryptology, Healthcare Systems, Automation Systems. Dr. Elngar is an Editor and Reviewer of many international journal around the world. Dr. Elngar won several awards including the Young Researcher in Computer Science Engineering", from Global Outreach Education Summit and Awards 2019, on 31 January 2019 (Thursday) at Delhi, India. Also, Dr. Elngar awards Best Young Researcher Award (Male) (Below 40 years)", Global Education and Corporate Leadership Awards (GECL-2018), Plot No-8, Shivaji Park, Alwar 301001, Rajasthan.

TS. DR. CHIN JI JIAN

Chin Ji Jian graduated from Campbell University with a Bachelor of Science Majoring in Computer Science and Computational Mathematics, earning a rank of Magna Cum Laude. Pursuing his postgraduate studies, he took his Master of Engineering Science and later on his P.h.D. at Multimedia University, specializing in cryptography. He earned an early completion for his doctoral studies as well as a Best Thesis Award in I.T. for his thesis.

A passionate teacher, Ji Jian has surpassed a decade of teaching experience. From the humble beginnings of an IGCSE home tutor during college, he currently holds a senior lecturer position at the Faculty of Engineering and continues to guide and share his knowledge the eager young minds of tomorrow. He also does the occasional upskilling programme and corporate training.

In his research, Ji Jian has spent more than a decade researching theoretical public key cryptography, specializing in entity and message authentication schemes such as identification and digital signature schemes, with particular interest in designing schemes that do not require certificates.

As such, he has an international publication portfolio consisting of over 50 peer-reviewed proceedings and journals. He has given several invited talks at University Putra Malaysia, Kyushu University and Institute of Systems, Technology and Nanotechnology in Japan. He served as programme committee and peer reviewer for several conferences such as Cryptology conference series in Malaysia and ProvSec, WISA and Asiacrypt conferences. He also served as organizing committee for ProvSec 2010, CANS2010 and MyCrypt 2016.

Eager to bridge the gap between theoretical cryptography and practical computer security, Ji Jian currently focuses his research interests on development and implementation projects such as searchable symmetric encryption and access-control prototypes using mobile devices. Not willing to be conformed to the theoretical aspects of security, he recently earned his CISSP in 2019, and concurrently won a trip to Seoul by acing the TOPCIT South Korean Government ICT exam, earning a Band 3 as well as top scorer for Malaysia for the 2nd exam batch.

An eSports hobbyist, Ji Jian once held an Archon 2 rank (~2300 MMR) on Defense of the Ancients, season 2. He plays on occasion with his colleagues and students, usually taking on the role of support/tank which often entails sacrificing a high K/D/A ratio to support his team in winning the match.

CONFERENCE PROGRAM

Day 1, Monday, June 21st, 2021

Time (UTC+8)	*Dur'*	*Activity*
CITIC Room 1		https://us02web.zoom.us/j/87290323420?pwd=bVpWN2ZibGFETkl5YzVFSDRNTEYwZz09 Meeting ID: 872 9032 3420 Password: DIFCON21
13:25 - 13:30	0:05	**MC Welcoming**
13:30 - 14:00	0:30	CITIC KEYNOTE SPEAKER 1 – ASSOC. PROF. DR. RAJKUMAR KANNAN
14:00 - 14:30	0:30	CITIC KEYNOTE SPEAKER 2 – PROF. DR. LEE CHIEN SING
14:30 - 14:35	0:05	Session Chair Introduction
14:35 - 16:20	1:45	**Presentation Session 7 person/room** 15 minutes/presenter
16:20 - 16:30	0:10	Awarding Certificate of Presentation, Testimonial, and Post-conference information announcement at each parallel online presentation rooms
16:30 -		Break & Announcement to go to Main Room at 16.30

Day 2, Tuesday, June 22nd, 2021

Time (UTC+8)			*Dur'*	*Activity*
CITIC Room 1				https://us02web.zoom.us/j/84534326836?pwd=U0MrckN5anp5dFRORjNyelQyVDhsQT09 Meeting ID: 845 3432 6836 Password: DIFCON21
9:30	-	9:35	0:05	**MC Welcoming**
9:35	-	10:05	0:30	CITIC Invited Speaker 1 – Assoc. Prof. Dr. Por Lip
10:05	-	10:35	0:30	CITIC Invited Speaker 2 – Assoc. Prof. Dr. Yap Wun She
10:35	-	10:40	0:05	Session Chair Introduction
10:40	-	12:40	2:00	**Presentation Session 8 person/room** 15 minutes/presenter
12:40	-	13:10	0:30	Break
13:10	-	13:15	0:05	Session Chair Introduction
13:15	-	15:15	2:00	**Presentation Session 8 person/room** 15 minutes/presenter
15:15	-			Break & Announcement to go to Main Room at 16.30

Day 3, Wednesday, June 23rd, 2021

Time (UTC+8)			*Dur'*	*Activity*
CITIC Room 1, 2 & 3				***CITIC - Room 1** https://us02web.zoom.us/j/86812625560?pwd=bExIekVUakNSTVppWnNuYUpvdkhrUT09 Meeting ID: 868 1262 5560 Password: DIFCON21 ***CITIC - Room 2** https://us02web.zoom.us/j/85777977822?pwd=NWs1WGFmVlFyVm1BRHRsbnNGb3hGdz09 Meeting ID: 857 7797 7822 Password: DIFCON21 ***CITIC - Room 3** https://us02web.zoom.us/j/86366546928?pwd=bHVDcFNjc0tDTXJVWGxOUWNqRittZz09 Meeting ID: 863 6654 6928 Password: DIFCON21
9:30	-	9:35	0:05	**MC Welcoming**
9:35	-	9:40	0:05	Session Chair Introduction
9:40	-	12:40	3:00	**Presentation Session 12 person -** 15 minutes/presenter
12:40	-	13:10	0:30	**Break**
13:10	-	13:15	0:05	Session Chair Introduction
13:10	-	16:10	3:00	**Presentation Session 12 person -** 15 minutes/presenter
16:10	-			Break & Announcement to go to Main Room at 16.30

Day 1: Monday - June 21, 2021

CITIC - Room 1

https://us02web.zoom.us/j/87290323420?pwd=bVpWN2ZibGFETkl5YzVFSDRNTEYwZz09
Meeting ID: 872 9032 3420 - Password: DIFCON21

Session 1: 14.35 - 16.20 (UTC+8)

Session Chair: Ts. Dr. Ooi Shih Yin

Track Computer Security and reliability

Paper ID	Presenter	Paper Title
TIC21109	Jason Chia	The Good, the Bad and the Broken: Digital Signature Schemes with Strong Existential Unforgeability Resistance
TIC21115	Yee Jian Chew	Privacy Based Decision Tree Pruning with an IP Truncation Approach: A Case Study in Network Intrusion Detection System
TIC21146	Zhen-Ang Soh	Security and Privacy of Contact Tracing Protocols for COVID-19
TIC21164	Venushini Rajendran	User Acceptance Test Towards IoT System Integrated with Mobile Application
TIC21182	Dr. Noramiza Hashim	Sentiment Analysis Classifier on Mental Health Chatbot
TIC21193	Chih Yang Pee	Numerically Efficient Tchebichef Moment Invariants for Handwritten Signature Recognition
TIC21181	Siti Fatimah Abdul Razak	Simulation Framework for Connected Vehicle : A Short Review

Day 2: Tuesday - June 22, 2021

CITIC - Room 1

https://us02web.zoom.us/j/84534326836?pwd=U0MrckN5anp5dFRORjNyelQyVDhsQT09
Meeting ID: 845 3432 6836 - Password: DIFCON21

Session 1: 10.40 - 12.40 (UTC+8)

Session Chair: Assoc. Prof. Ts. Dr. Pang Ying Han

Track Computer Security and reliability

Paper ID	Presenter	Paper Title
TIC21168	Jaya Kumar Krishnan	Artificial Intelligence Use in Schools in Malaysia

Track Image Processing

TIC21107	Md Roman Bhuiyan	Video Analytics using Deep Learning for Hajj Pilgrimage Crowd Density
TIC21108	Wee How Khoh	A Public Database for In-Air Hand Gesture Signature Recognition
TIC21116	Leow Yen Siang	Sickle Cell Segmentation and Classification for Thalassemia Aid Diagnosis
TIC21119	Albert Quek	Let's Cook: Gesture-based Virtual Reality Game for Physical Rehabilitation
TIC21125	Ting-Chang Chan	The Effects of Different Levels of Color Depth Towards the Decoding Capability of the Blended QR Code
TIC21138	Wan Noorshahida Mohd Isa	CLAHE for Enhancement of Digitized X-Ray Films

Day 2: Tuesday - June 22, 2021

CITIC - Room 1

https://us02web.zoom.us/j/84534326836?pwd=U0MrckN5anp5dFRORjNyelQyVDhsQT09
Meeting ID: 845 3432 6836
Password: DIFCON21

Session 2: 13.15 - 15.15 (UTC+8)

Session Chair: Dr. Ihtiram Raza Khan

Track Image Processing

Paper ID	Presenter	Paper Title
TIC21103	Ying Han Pang	Stacked Discriminant Feature Learning for Smartphone-based Human Activity Recognition on UCI HAR Database
TIC21149	Sarmela Raja Sekaran	Subject Independent Human Activity Recognition using Multiscale Temporal Convolutional Network
TIC21171	Aziah Ali	Optic Disc Localisation from Retinal Image using Vessel Masking and Hough Transform
TIC21172	Aziah Ali	Enhanced Pre-processing Method for Improved Retinal Vessel Segmentation from High Resolution Fundus Image

Track Information System

Paper ID	Presenter	Paper Title
TIC21102	Aisyah Amin	An Efficient Labeling Scheme for Dynamic Updates in XML Databases
TIC21110	Choo Peng Tan	The Design and Development of Conversational Agents for Mathematics Learning
TIC21111	Tan Choo Kim	Students' Perception Towards Learning Agent
TIC21129	Kee-Lin Neoh	A Timetabling Method for University Online Classes
TIC21131	Sini Govindapillai	Resource Description Framework (RDF) Reification in Knowledge Graphs

Day 3: Wednesday - June 23, 2021

CITIC - Room 1

https://us02web.zoom.us/j/86812625560?pwd=bExIekVUakNSTVppWnNuYUpvdkhrUT09
Meeting ID: 868 1262 5560
Password: DIFCON21

Session 1: 9.40 - 12.40 (UTC+8)

Session Chair: Assoc. Prof. Ts. Dr. Ong Thian Song

Track Information System

Paper ID	Presenter	Paper Title
TIC21134	Mawar Binti Madiah	Student's Learning Experiences and Perceptions of Learning Programming Online
TIC21144	Chew Lit-Jie	Dataset Enrichment using Ontology in Hybrid Recommender System
TIC21152	Tze Hui Liew	Effects of Screen Size on E-Learning Productivity: An Evidence from Malaysia's University Students
TIC21160	Hen Toong Tai	An Empirical Study on the Impact of Virtual Learning on Multimedia University Student Performance.
TIC21161	Tan Choo Kim	Effectiveness of Learning with Pedagogical Agent in Mathematics
TIC21162	Kalaiarasi Sonai Muthu Anbananthen	Typographic Error Detection in Conversational Agent Development

TIC21167	Jaya Kumar Krishnan	Adaptive Learning for Schools in Malaysia
TIC21114	Tan Choo Kim	Undergraduates' Perception on Distance Learning During Pandemic
TIC21117	Lam Xin Hui	WBCs-based Segmentation and Classification on Microscopic Images: A Minor Improvement
TIC21148	Choo Peng Tan	Students Perception on Incorporation of Conversational Agents in Mathematics Learning
TIC21159	Tze Hui Liew	Child-Computer Interaction and Screen Size: What does Malaysia's Pre-School Children Say?
TIC21180	Muammar Ghadafi Bin Badrul Hisham	Model-Based Data Generation and Customer Simulation of Point-of-Sales Transactions

Day 3: Wednesday - June 23, 2021

CITIC - Room 1

https://us02web.zoom.us/j/86812625560?pwd=bExIekVUakNSTVppWnNuYUpvdkhrUT09
Meeting ID: 868 1262 5560
Password: DIFCON21

Session 2: 13.10 - 16.10 (UTC+8)

Session Chair: Dr. Reshma V.K

Track Information System

Paper ID	Presenter	Paper Title
TIC21183	Tan Choo Kim	Learning Discrete Mathematics through Online Learning
TIC21184	Tan Choo Kim	Students' Perception Towards Learning Agent
TIC21185	Tan Choo Kim	A Proposed Framework: Information Security and Pedagogical Agent
TIC21186	Tan Choo Kim	Effects of Learning Agent Approach on Students' Mathematics Anxiety
TIC21118	Siti Fatimah Abdul Razak	Driver Perceptions on Advanced Drive Assistance Systems: A Case Study
TIC21187	Tan Choo Kim	Impact of Incorporation of the Virtual Agent on Mathematics Learning
TIC21188	Tan Choo Kim	Construct Simple Sentences in Past Continuous Tense using ‘Connect Me' Model
TIC21189	Tan Choo Kim	English Language Teaching Challenges and Solutions Due to E-learning

Track Information Technology

Paper ID	Presenter	Paper Title
TIC21112	Tan Sin Yin	Incorporating of Augmented Reality Technology in Teaching and Learning Vectors
TIC21113	Han-foon Neo	Augmented Reality Emotion Recognition for Autism Spectrum Disorder Children
TIC21135	Moesfa Soeheila Mohamad	Boneh-Boyen Identity-based Signature
TIC21178	Shahida Raihan Manzoor	Post-Pandemic E-learning: A Conceptual Study on the Integration of Mobile VR and VARK Learning Style

Day 3: Wednesday - June 23, 2021

CITIC - Room 2

https://us02web.zoom.us/j/85777977822?pwd=NWs1WGFmVlFyVm1BRHRsbnNGb3hGdz09
Meeting ID: 857 7797 7822
Password: DIFCON21

Session 1: 9.40 - 12.40 (UTC+8)

Session Chair: Assoc. Prof. Ts. Dr. Md. Shohel Sayeed

Track Artificial Intelligence (outline)

Paper ID	Presenter	Paper Title
TIC21173	Yit Yin Wee	An Amalgamation of Fuzzy Cognitive Map and Bayesian Belief Network in Root Cause Analysis
TIC21174	Maw Maw	Algorithmic Fairness for Customer Churn Prediction with Unbalanced Data Distribution

Track Machine Learning

Paper ID	Presenter	Paper Title
TIC21127	Nicholas Yu-Zhe Tan	The Effects of Temporal Variables in Customer Churn Service Type using Dynamic Bayesian Networks
TIC21132	Tee Connie	A Visual Approach Towards Forward Collision Warning for Autonomous Vehicles on Malaysian Public Roads

TIC21151	Khalid Ibrahim Adem	Facial Expression Recognition using In-the-Wild Datasets with Improved Performance Metrics
TIC21163	Sharifah Noor Masidayu Sayed Ismail	Evaluation of Electrocardiogram Numerical vs Image Data for Emotion Recognition System
TIC21169	Sin-Ban Ho	Optimised Neural Network Regression Model for Predicting Asthma Exacerbation Based on Personalised Weather Triggers
TIC21175	Kuhaneswaran	Particulate Matter (PM2.5) Concentration in Smart Cities using Machine Learning Algorithms: A Review
TIC21179	Ng Zhen Xiong	Categorising of FYP Projects using LDA Modelling and K-Means Clustering
TIC21123	Wing Shum Lee	Review of Accelerometer-based Road Monitoring Systems
TIC21128	Nicholas Yu-Zhe Tan	Comparison of Different Clustering Methods on The Effects of Customer Churn

Day 3: Wednesday - June 23, 2021

CITIC - Room 2

https://us02web.zoom.us/j/85777977822?pwd=NWs1WGFmVlFyVm1BRHRsbnNGb3hGdz09
Meeting ID: 857 7797 7822
Password: DIFCON21

Session 2: 13.10 - 16.10 (UTC+8)

Session Chair: Dr. Ahmed Elngar

Track Machine Learning

Paper ID	Presenter	Paper Title
TIC21120	Hu Ng	Modeling Sentiments and Opinions Based on Objectivity and Subjectivity with Self-Attention Mechanisms
TIC21140	Hu Ng	Predictive Modelling of Student Performance based on Machine Learning Approach
TIC21141	Ong Kyle	Neural Matrix Factorization++ based Recommendation System
TIC21142	Nurulhuda Mustafa	Customer Churn Prediction for Telecommunication Industry: A Malaysian Case Study
TIC21145	Tee Connie	Non-Invasive Health Prediction from Visually Observable Features
TIC21157	Hu Ng	Comparison of the Performance of Sentiment Classifiers on Tweets of Clothing Brands
TIC21158	Hu Ng	Significant Page Elements for E-Commerce Websites through a Data Mining Approach

TIC21176	Rishanti	Predicting Particulate Matter (PM2.5) using Machine Learning Methods
TIC21177	Arpita Bhattacharijee	Extremist Content Detection on Social Media: A Hybrid Machine Learning Approach
TIC21190	Kalaiarasi Sonai Muthu Anbananthen	Improving the Prediction of Crop Yield with a Stacked Generalization Ensemble Method

Track Blockchain

Paper ID	Presenter	Paper Title
TIC21105	Timothy Tzen Vun Yap	Exploratory Graph Analysis of the Transactions on the Bitcoin Network
TIC21130	Olaosebikan Tahir Yinka	A Blockchain-based Data Access Control for Healthcare

Day 3: Wednesday - June 23, 2021

CITIC - Room 3

https://us02web.zoom.us/j/86366546928?pwd=bHVDcFNjc0tDTXJVWGxOUWNqRittZz09
Meeting ID: 863 6654 6928
Password: DIFCON21

Session 1: 9.40 - 12.40 (UTC+8)

Session Chair: Ts. Dr. Ng Hu

Track Blockchain

Paper ID	Presenter	Paper Title
TIC21191	Nur Azyyati Ahmad	Micro-Credential Digital Badge with Blockchain in Higher Learning Education
TIC21106	Timothy Tzen Vun Yap	Exploratory Graph Analysis of the Transactions on the Ethereum Network

Track Internet Of Things (iot)

Paper ID	Presenter	Paper Title
TIC21147	Sumendra Yogarayan	Edge Computing (EC) for Vehicle to Everything (V2X): A Short Review
TIC21153	Ajajja	Internet of Things Technologies (IoT) Based Digital Stethoscope
TIC21154	Amar Lokman	Study of Component in IoT Based Implementation

TIC21165	Abu Fuad Ahmad	Smartic : A Smart Tool for Big Data Analytics and IoT
TIC21166	Subarmaniam Kannan	Synthetic Data Generation For Edge Analytics

Track Big Data

Paper ID	Presenter	Paper Title
TIC21104	Shruthi Thangaraj	Modified Recurrent Equation-based Cubic Spline Interpolation for Missing Data Recovery in Phasor Measurement Unit (PMU)
TIC21121	Ranjith Anbananthan	Micro-Segmentation of E-Commerce Customers using RFM Models and K-Means Clustering
TIC21137	Soon Wei Leong	Restaurant Recommendation System using Collaborative Filtering Algorithms

Track Computer Science

Paper ID	Presenter	Paper Title
TIC21126	Fahmid Al Farid	Vision Based Hand Gesture Recognition: A Review
TIC21170	Dr Zarina Che Embi	A Systematic Review on Agile Requirements Engineering for Software Security

Day 3: Wednesday - June 23, 2021

CITIC - Room 3

https://us02web.zoom.us/j/86366546928?pwd=bHVDcFNjc0tDTXJVWGxOUWNqRittZz09
Meeting ID: 863 6654 6928
Password: DIFCON21

Session 2: 13.10 - 16.10 (UTC+8)

Session Chair: Ts. Dr. Chin Ji Jian

Track Data Mining

Paper ID	Presenter	Paper Title
	Sia Boon Zhan	Bioinformatic Analysis of SARS-CoV-2 Nonsynonymous Mutations
TIC21139	Nur Amirah Ishak	An Enhanced Stacking Classifiers System for Credit Card Frauds Detection
TIC21150	Keng-Hoong Ng	Performance Profiling of the Malaysian Unit Trust Funds with Data Mining Techniques
TIC21124	Wan Xin Boon	Bioinformatic Analysis of SARS-CoV-2 Synonymous Mutations

Track Computing in Social Sciences, Arts, Humanities, and Profession

Paper ID	Presenter	Paper Title
TIC21133	Cheng Yun Quan	Exploitation of Current Game Technology for Driving Education with AITechniques and VR
TIC21136	Md Asifur Rahman	Interactive Augmented Reality Application for Learning Calculus
TIC21192	Nurul Izzah Khumaira Md Amurad	A Non-Immersive Virtual Reality Training Application for Children with Autism Spectrum Disorder using Data Analytics and Rule-based System
TIC21143	Daniel Lai	Synchronous Display and Whiteboard-Like Freehand Writing App as Teaching Tool for Virtual Classroom Amidst the Pandemic

Track: Computer Security and Reliability

The Good, the Bad and the Broken: Digital Signature Schemes with Strong Existential Unforgeability Resistance

Jason Chia[1], Ji Jian Chin[2], Sook Chin Yip[3]

[1,2,3]Multimedia University

Abstract

Background - *Digital signature schemes (DSS) are ubiquitously used for public authentication in the infrastructure of the internet, in addition to their use as a cryptographic tool to construct even more sophisticated schemes such as identity-based cryptographic schemes. The security of DSS are analyzed through the existential unforgeability under chosen message attack (EUF-CMA) experiment which promises unforgeability of signatures on new messages even when the attacker has access to an arbitrary set of messages and their corresponding signatures. However, the EUF-CMA model does not account for attacks such as an attacker forging a different signature on an existing message, even though the attack could be devastating in the real world. It constitutes a severe breach of the security system. Nonetheless, most of the DSS are not analyzed in this security model, which possibly makes them vulnerable to such an attack. In contrast, a better security notion known as strong EUF-CMA (sEUF-CMA) is designed to be resistant against such attacks.*

Purpose - *This review aims to identify DSS in the literature that are secure in the sEUF-CMA model. In addition, this review also discusses the challenges and future directions of DSS.*

Design/methodology/approach - *The method we used to conduct the review is by considering the security of existing DSS that fit our criterion in the sEUF-CMA model. Our review criterion is simple as we do not consider impractical schemes but only require the DSS to be at least EUF-CMA security.*

Findings - *Our findings are categorized into two classes: namely the direct and indirect classes of sEUF-CMA. The former is inherently sEUF-CMA without any modification while the latter requires some transformation.*

Research limitations - *The limitation of our work is that we mainly consider the DSS that exist in the literature. However, we do not provide extensive coverage to possible schemes due to results from frameworks such as the Fiat-Shamir paradigm for identification protocol.*

Originality/value - *Our review contributes to the security and cryptographic research community by giving a comprehensive survey on the efficiency and security of DSS that are sEUF-CMA, which aids them to select robust DSS in their design considerations.*

Keywords : Cryptography, Digital Signatures, Strong Existential Unforgeability

Privacy Based Decision Tree Pruning with an IP Truncation Approach: A Case Study in Network Intrusion Detection System

Yee Jian Chew[1], Shih Yin Ooi[2], Kok-Seng Wong[3], Ying Han Pang[4]

[1,2,4]Multimedia University, [3]Vinuniversity

Abstract

Background - *Decision tree is a powerful white-box classifier encompassing branches and nodes to deliver an interpretable model in the form of "if-else" rules. As most of the information is visible in the tree-like structure, the model is highly susceptible to the privacy attacks.*

Purpose - *IP address is viewed as a personal data when it is used for profiling an individual. Thus, to reduce the privacy risks, a data anonymization approach of IP truncation is embedded into the C4.5 tree. This indicates that some information will be masked and might degrading the performance of C4.5 tree, and this will be specifically examined here.*

Design/methodology/approach - *The examination is tested on a 6-percent-GureKDDCup'99 NIDS dataset. This dataset is suitable because it contains IP addresses, which the IP truncation method will be applied on. Truncation was performed on IP address in three ways: 8-bit-truncation, 16-bit-truncation, and 24-bit-truncation. Given the original IP address as "192.168.123.121", 8-bit-truncation will zeroized the last byte (8-bit) of the IP address, and thus representing it as "192.168.123.0"; 16-bit-truncation will zeroized the last 2 bytes of the original IP address and representing it as "192.168.0.0"; whereas 24-bit-truncation will zeroized the last 3 bytes of the original IP address and representing it as "192.0.0.0". The goal of this proposed method is twofold: (1) to anonymize the real IP address, and (2) to prune the original C4.5 decision tree. The classification performance of the proposed method was evaluated based on a 10-fold cross-validation.*

Findings - *The empirical results are subsequently deliberated in Table 1. (Results are tabulated)*

Research limitations - *A very small performance degradation is observed (refer Table 1) after the truncation application. This can be viewed as a tradeoff of privacy.*

Originality/value - *The proposed pruning method spells two main advantages: (1) the IP address can be anonymized to prevent any potential user profiling, and (2) the number of nodes in C4.5 tree is tremendously reduced to make the rule interpretation possible while maintaining the classification accuracy.*

Keywords : privacy preserving, IP address truncation, C4.5 decision tree, pruning, network intrusion detection system

Security and Privacy of Contact Tracing Protocols for COVID-19

Zhen-Ang Soh[1], Swee-Huay Heng[2]

[1,2]Multimedia University

Abstract

Background - *The new coronavirus COVID-19 was discovered at the end of 2019 and spread rapidly around the world. Protective measures have been taken against this deadly virus. Contact tracing is a way to track people who have been in contact with infected patients and thereby effective control is achieved. Various countries have developed their own contact tracing applications which deploy the same or different protocol. It is of utmost importance to improve public awareness on the potential hidden risks of the respective protocols and instill user confidence.*

Purpose - *The purpose of this research is to study the security and privacy of the existing contact tracing protocols to ensure that the security and privacy of users can be guaranteed.*

Design/methodology/approach - *This research performs a comprehensive study on how the respective applications store the user data, the protocols used, the structure of the protocols and the differences between these protocols. In addition, the contact tracing applications in seven countries will also be briefly analysed and compared.*

Findings - *The protocols used by the applications include DP-3T protocol, TCN protocol, PEPP-PT protocol and BlueTrace protocol. The architecture of the protocols can be classified into centralised architecture and decentralised architecture. The centralised architecture stores data in a central server while the decentralised architecture stores data in the user's own device. PEPP-PT and BlueTrace protocols are not as safe as DP-3T and TCN as PEPP-PT has a central server while BlueTrace is a hybrid model. The user privacy is likely to be leaked if the central server managing huge database is malicious. The contact tracing application in each country in terms of storage method and security are evaluated and limitations are pointed out. Some common user concerns on user information privacy and protection, device storage capacity problem and location issue are outlined.*

Research limitations - *This study is by no means exhaustive as it takes into account protocols that are well-known and widely used only.*

Originality/value - *The security and the privacy of the contact tracing protocols with emphasis on how to avoid potential leakage of user data.*

Keywords : COVID-19, security, privacy, protocol, contact tracing

User Acceptance Test Towards IoT System Integrated with Mobile Application

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[1,2,3]Multimedia University

Abstract

Background - *While the Internet of Things based smart home or industry solutions can enhance approaches to engage with such activities more manageable compared to the conventional system, the acceptance of end-user is not desirable due to inadequate study of the approaches towards understanding user satisfaction.*

Purpose - *The aim of this research is to develop and test a theoretical framework to determine the key factors that can affect users' adoption of smart technology, such as integrated sensors with real-time mobile application like Smart Toilet.*

Design/methodology/approach - *User expectations were measured at a conceptual level rather than the actual intention towards the specific system by using the proposed model Modified Mobile Application Integrated with IoT Technology – The Unified Theory of Acceptance and Use (M2IoT-UTAUT) which is used to obtain user acceptance for Smart Toilet. The subjects were employees and students of the Faculty of Computing Informatics (FCI), Multimedia University. Questionnaire was developed by using propose model M2IoT-UTAUT and given to the subjects.*

Findings - *The sample respondents consist of 65% males and 35% females. Evaluation of the frequency of the desired sample even in relation to the age range suggests that the greatest proportion of frequency samples are from 30 years and below, which is 56 % of the respondent's total. The highest positive remark that is given for male and female is by the age range of 30 years old and below. Age range from 50 years old and above for male has more positive remark than those in the female. The M2IoT-UTAUT model relationship to accept Smart Toilet on FCI, MMU is significant.*

Research limitations - *It is recommended that further research should expand the boundaries and includes more nation into this research in order to generalize this theoretical study*

Originality/value - *Based on this research, the positive outcome from end user on acceptance of smart toilet technology leads this research forward.This paper provides the groundwork to explore the process of actual adoption of smart toilet and the needs to accept the fact of technology in end-user premises.*

Keywords : Internet of Things, Mobile Application, User-Acceptance Test, user-perception

Artificial Intelligence Use in Schools in Malaysia

Jaya Kumar Krishnan[1]

[1]Multimedia University

Abstract

Background - *This paper is a proposal to describe the implementation of artificial intelligence technologies learning influence in schools in Malaysia. The goal of the research is to foster artificial intelligence technologies for authentic learning, spreading digital fluency and improving the teaching profession.*

Purpose - *The goal of the research is to implement the artificial intelligence technologies that could alter the learning process and environment in schools in Malaysia. In this paper, artificial intelligence is adapted in learning tools and will discuss on how the system fits in our schools.*

Design/methodology/approach - *The proposed framework consists of two major components which are AI based learning and additional AI features. The proposed features are performance monitoring, planner, automated academic planning, attendance monitoring, peer tutors and safety features. The features stated are carefully studied on their pros and cons and is concluded that it suits best for effective artificial intelligence technologies implementations in schools in Malaysia. In addition to acting as a personalised learning companion, artificial intelligence will also be able to help students with special needs by adapting materials to ensure they excel.*

Findings - *Artificial intelligence-based learning will give a modern touch to learning system and can play vital role to provide optimistic learning environment if it is adapted well among students and schools. With an influx of new learning methods, education methods are bound to evolve in the coming decades. Students given an earlier approach in technology will boost their skills and learning approach. Artificial intelligence technologies in schools will boost more individualised learning and self-paced learning.*

Research limitations - *Artificial intelligence technologies have not been widely accepted in our education systems to facilitate teaching. This is due, to our current educational models and systems, which are still stuck in their traditional forms, halting the progress in adapting artificial intelligence systems.*

Originality/value - *Artificial Intelligence technologies can be implemented in schools through an artificial intelligence learning system framework. An artificial intelligence learning system framework with an integrated online educational system that modifies the learning material in response to student performance and needs.*

Keywords : Artificial Intelligence, personalised learning.

Simulation Framework for Connected Vehicle : A Short Review

Siti Fatimah Abdul Razak[1]

[1]Multimedia University

Abstract

Background - *Evaluating the performance of vehicle-to-vehicle (V2V) systems in urban environments under dynamic traffic and road conditions is difficult since the conditions cannot be generated in practice. Hence, most researcher rely on vehicular simulation tools to model the traffic and road conditions and evaluate the performance of network protocols.*

Purpose - *Given that the existing comparative studies do not cover in terms of evaluating the performance of V2V systems, we compared the vehicular simulation tools in this context to facilitate researchers in this area in their attempt to choose an appropriate simulator from the pool of available simulators.*

Design/methodology/approach - *This study considers simulators which has been reported in the literature based on successful implementation of V2V systems, tutorials, documentation, examples, and/or discussion groups. Simulators which have limited information are not included. The selected simulators are described individually and compared based on their and requirements and features i.e. origin, traffic model, scalability, traffic features and etc.*

Findings - *The findings show that most simulators can simulate system behaviour by modeling the events according to pre-defined scenarios. This include popular choices like TraNS, OMNeT++, NetSim and etc. However, the main challenge faced is in terms of integrating the three components to simulate a road environment in either microscopic, macroscopic or mesoscopic models. This components include the mobility generators, VANET simulator and network simulators. These simulators requires the integration and synchronization of the transportation domain and the communication domain. Simulation modeling can be run using different type of simulators which are cost-effective and scalable for evaluating the performance of V2Vsystems in urban environments. In addition, we also consider the ability of the vehicular simulation tools to support wireless sensors.*

Research limitations - *The simulators reviewed in this study is limited to literature on successful implementation reported for V2V systems.*

Originality/value - *The outcome of this study may reduce the time required for other researchers to work on other applications involving V2V systems and as a reference for the study and development of new traffic simulators.*

Keywords : V2V, connected vehicle, collision avoidance, V2V, simulation

Sentiment Analysis Classifier on Mental Health Chatbot

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[1,2]Multimedia University

Abstract

Background - *As the advancement of the research in natural language processing and conversation agents keep progressing, it offers multiple possibilities in providing such services in health management. It is found that conversational agents are in a high demand of assisting mental health issues to the community as it provides a sense of behavioral therapy.*

Purpose - *The purpose of this research is to refine and improve the model accuracy used to create the conversational instances of the chatbot application. Other than that, it also focuses on studying existing methods and algorithms used for text sentiment and emotion analysis.*

Design/methodology/approach - *In this work, we will use the research of conversational agents with sentiment analysis to produce an application that is able to support the community in regulating their thoughts and emotions. The mental health chatbot application called Buddy will be able to ask the user on any events that occurred and classify the associated emotions. Based on the knowledge of sentiment analysis, it automatically determines the basic emotion of a user using natural language processing and deep learning models. Depending on the emotion, we analyses the mental state of the user.*

Findings - *In the chatbot generation, we explore the use of retrieval-based chatbot systems that use predefined input and responses. We explore different deep learning methods used in multi-class emotion classification such as LSTM, Bi-LSTM, and CNN. Thus, the implementation of the mobile application is to prove the concept of this research used in conversational agents and emotion analysis. The performance of the chatbot is evaluated using performance metrics like content evaluation, user satisfaction and functional evaluation.*

Research limitations - *The limitation of this research is where the emotion classification is limited by accessing only 5 emotions; joy, sadness, neutral, anger and fear.*

Originality/value - *In this research, we also present a general architecture of the mental health chatbot application system combining a chatbot response generation and a multi-class emotion classification. The message will be passed to chatbot model and multiclass emotion model to classify the chatbot response and the emotion classification of the message.*

Keywords : Sentiment Analysis, Chatbot. Conversational Agents, Natural Language Processing, Text Emotion Classification

Track: Image Processing

Stacked Discriminant Feature Learning for Smartphone-based Human Activity Recognition on UCI HAR Database

Ying Han Pang[1], Liew Yee Ping[2], Goh Fan Ling[3], Ooi Shih Yin[4], Khoh Wee How[5]

[1,2,4,5]Multimedia University, [3]Millapp Sdn Bhd

Abstract

Background - *Human activity recognition has been employed in various applications including human-computer interaction, healthcare monitoring, assisted living, etc. Due to low cost and ubiquity, smartphone-based human activity recognition is emerging as a trendy mobile application.*

Purpose - *Analysing motion signals is a challenging task, especially in the subject-independent solution where the system model (trained by data from a group of users) is used to recognize data of different users. Extensive works on deep neural networks (DNNs) are conducted in pattern recognition to unveil deep features of the complex real-world data. However, the drawback of DNNs is the un-interpretation for the network's internal logic to achieve the output. Besides, large training sample size (millions samples) is needed to ensure DNNs' good performance.*

Design/methodology/approach - *A simpler yet effective modular deep network - Stacked Discriminant Feature Learning (SDFL) is proposed to analyse one-dimensional inertial data for activity recognition. Contrary to DNNs, this deep model extracts informative features without the need of a gigantic training set and tenuous hyper-parameter tuning. SDFL is a stacking deep network with multiple learning modules, one after another, in a cascading framework for multi-level feature learning from shallow to deeper features. In each learning module, optimized learning based on Rayleigh coefficient optimization is performed to extract discriminant features.*

Findings - *A popular public database (UCI HAR) is used and subject-independent protocol is implemented. Empirical results demonstrate that SDFL outperforms state-of-the-art approaches, including DNNs like Convolutional Neural Network, Deep Belief Network, etc., with 97% accuracy using this medium-size training dataset (thousands samples). Furthermore, the model training time of SDFL is merely few minutes, compared with that of DNNs which requires hours for model training. In conclusion, the superiority of SDFL is substantiated in analysing motion data with the stacking learning demanding no GPU but only a CPU and with a fast learning rate.*

Research limitations - *Kernelization of SDFL will be interesting for future exploration to better cater the nonlinear manifold of real-world data.*

Originality/value - *A light computational stacking deep network is proposed without long training time and GPU, but achieving superior performance to DNNs.*

Keywords : Smartphone, one-dimensional motion signal, activity recognition, stacking deep network, discriminant learning

Video Analytics using Deep Learning for Hajj Pilgrimage Crowd Density

Md Roman Bhuiyan[1], Dr. Junaidi Abdullah [2], Dr. Noramiza Hashim [3], Fahmid Al Farid [4]

[1,2,3,4]Multimedia University, Cyberjaya, Malaysia

Abstract

Background - *This paper focuses on advances in crowd control study with an emphasis in high-density crowds particular for Hajj crowds. Video analysis and visible surveillance to improve pilgrimage safety and security in Makkah has recently been of growing importance. Currently, visual surveillance research is still in the early stages for the Hajj and Umrah framework.*

Purpose - *Hajj is seen as a very unique activity that shows hundreds of thousands of people congregating in a small area where sophisticated video processing and computer vision algorithms fail to generate an accurate analysis of the video content.*

Design/methodology/approach - *This paper aims to propose an algorithms based on Convolutional Neural Networks (CNN) model specifically for Hajj applications. Additionally, the work introduces a system for counting and then estimating the crowd density. The model adopts an architecture which detects each person in the crowd, spotted head location with a bounding box and does the counting in our own created novel dataset (HAJJ-Crowd).*

Findings - *In the context of new dataset (named HAJJ-Crowd dataset), Our algorithm outperforms the state-of-the-art method, , which attains a remarkable Mean Absolute Error (MAE) result of: 246.0 (173.5 improvement) and Mean Square Error (MSE) of 266.5 (275.1 improvement).*

Research limitations - *To date, there are many open-ended issues in this area that call for improvement in future research works.*

Originality/value - *In our novel HAJJ-Crowd dataset for evaluation and testing, we have density map and prediction results of some standard method.*

Keywords : Visual Surveillance, Density Estimation, Crowd Counting, CNN

A Public Database for In-Air Hand Gesture Signature Recognition

Wee How Khoh[1]

[1]Multimedia University

Abstract

Background - *Hand gesture recognition as an important part of Human-Computer Interaction (HCI) has gained lots of attention with the advancement of today's technology. It could be extended to make a signature by the hand gesture, which provides the computer an ability to recognize the identity of a person in a touchless acquisition environment. This domain is named in-air hand gesture signature recognition.*

Purpose - *One of the most challenging tasks in in-air hand gesture signature is the acquisition process to gather samples of signature hand motions. To the best of our knowledge, there have no publicly available databases nor detailed acquisition procedures have been discussed in the relevant field. This study aims to describe the acquisition process and establishment procedure of the database which is released as a benchmark database in the relevant fields.*

Design/methodology/approach - *The hand gesture signature database was built from 100 voluntary subjects who contributed to two different datasets, genuine dataset, and forgery dataset, captured with a Microsoft Kinect sensor camera. Each subject was attending two sessions resulting in 20 genuine signatures and 10 skilled forgeries. For each sample, hand localization and predictive hand segmentation algorithms are applied to eliminate the unwanted regions. To evaluate the robustness of the database, several proposed features are extracted.*

Findings - *In this work, classification performance analysis and system robustness analysis are carried out on the collected database. For the former analysis, a multiclass Support Vector Machine (SVM) is employed to classify the samples and achieved 97.43% accuracy in classification and an error rate of 2.41% and 5.07% in random forgery and skilled forgery attacks for the latter analysis. These findings indicate that hand gesture signature can not only capable be used in classification but its properties can also robust against several forgery attacks.*

Research limitations - *The current database was collected in a controlled environment. As a biometric authentication, additional uncontrolled external factors could be further considered.*

Originality/value - *Self-collected database for in-air hand gesture signature.*

Keywords : Dynamic Signature, Hand Gesture Signature, Gesture Recognition, Hand Gesture Signature Database, Image Processing

Sickle Cell Segmentation and Classification For Thalassemia Aid Diagnosis

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Abstract

Background - *Thalassemia is a hereditary blood disease which the abnormal Red Blood Cells (RBCs) carry insufficient oxygen throughout the body. Conventional methods of thalassemia detection through Complete Blood Count (CBC) test and peripheral blood smear image still possess a lot of rooms for improvement.*

Purpose - *This paper proposes a hybrid segmentation method to segment the RBCs. A few popular segmentation methods have been implemented for comparison with the proposed method. Next, data imbalance treatment is used for solving the imbalance cell type class in distribution. This paper has also compared and employed highly precise methods in data resampling layer and classification layer.*

Design/methodology/approach - *This paper pre-processes the images to increase the contrast and quality of the image by using median filtering and image sharpening. A hybrid technique which incorporates adaptive thresholding and canny edge method are performed to segment the RBCs. Morphological operations are performed to clean up leftover. Shape and texture features are extracted using the segmented masks and Gray Level Cooccurrence Matrix. In the data resampling layer, Synthetic Minority Oversampling Technique (SMOTE), Adaptive Synthetic Sampling (ADASYN), and Random Over Sampling (ROS) are performed and evaluated using Decision Tree and Logistic Regression. In the classification layer, Decision Tree, Random Forest Classifier and Support Vector Machine (SVM) are to be compared and the best classifier is chosen for the classification.*

Findings - *In image segmentation layer, the proposed method outperforms other methods with the Structure Similarity Index of 89.88%. In data resampling layer, ADASYN is employed as it is more accurate than SMOTE and ROS. At the classification layer, Random Forest Classifier is employed as it is more superb than Decision Tree and Support Vector Machine (SVM).*

Research limitations - *Due to time constraint, this research work has not been thoroughly tested on other dataset for its robustness in segmentation and classification layer.*

Originality/value - *The proposed method is tested on the latest dataset of erythrocyteIDB3. It combines sampling techniques to solve the issues of imbalanced data due to insufficient cell classes. Comparisons are done in between different techniques for the image segmentation layer, data resampling layer and the classification layer.*

Keywords : Image Segmentation, Image Resampling, Cell Classification, Thalassemia, Red Blood Cells.

Let's Cook: Gesture-Based Virtual Reality Game for Physical Rehabilitation

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Abstract

Background - *Physical rehabilitation is a process for a person who suffered from physical impairments to recover their physical ability. To regain their motor function, patients need to do a lot of exercises and most of the exercises are repetitive and boring.*

Purpose - *Let's Cook, the virtual reality game aims to motivate and provide interactive experience to patients in performing the rehabilitation exercises. The game focuses on food preparation where patients can virtually prepare food and thus increases the motivation in performing rehabilitation exercises.*

Design/methodology/approach - *Leap Motion Controller is used for this game to track the hand gestures of the player in performing the exercises. The game also allows the player or physiotherapist to customize the duration of the exercise and select suitable exercises*

Findings - *The game is tested on a Parkinson's patient. The result shows that the game is easy to learn and fun for the patient. The game is safe to be played by the patient at home with the help of a family member. The exercises in the game are neither too easy nor too hard for the patient. Based on observation, the patient did not experience hand fatigue as the game provides intervals in between exercises for the patient to rest. Although the game provides a good experience for the patient, the pace of the game is a bit fast, and the patient does not have enough time to complete all the exercises.*

Research limitations - *The overall experience of the game is affected by the accuracy of the Leap Motion Controller and head tracking from the mobile virtual reality headset. Due to a lesser accuracy of the Leap Motion Controller, the patient has to repeat the same exercise multiple times, thus the patient is unable to complete the game.*

Originality/value - *However, from the initial observation, the use of game elements such as sensory stimuli, speed and actions in the game engages the patient in working on the exercise. In summary, the game can make the rehabilitation process more engaging through the use of virtual reality and gesture based interaction.*

Keywords : upper limb rehabilitation, hand gesture, virtual reality, serious game

The Effects of Different Levels of Color Depth Towards the Decoding Capability of the Blended QR Code

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Abstract

Background - *Quick Response (QR) code is widely applied around the world over the years to provide the shortcut to keep a variety of information, such as simple text, addresses, phone numbers, email and website links. The appearance of the QR code has always been black and white until 2014 when blended QR code was invented, allowing the insertion of symbol or logo image into the QR code for advertising purposes. However, the blending of colors from the background image creates the chromatic distortion, which imposes multiple color interference on the blended QR code. Different levels of color depth from the background image interfere with the capability of the QR code scanner to extract the embedded information within the blended QR code.*

Purpose - *This paper aims to propose a new methodology to reduce the color interference of the background image while increase the success rate of decoding the blended QR code through constrast enhancement and tone switching.*

Design/methodology/approach - *The contrast enhancement is applied to separate the background image into dark and bright regions representing the black and white modules respectively. Then, tone switching is performed to the dark region to ensure that the grayscale values achieve an acceptable level of contrast effect for achieving the decoding capability of the blended QR code. The proposed methodology is tested with experiments to simulate the situation of chromatic distortion.*

Findings - *The first experiment excludes external environment factors where the blended QR codes are being scanned directly from the QR code image. The second experiment includes the external factors from lighting conditions or scanning distance. The experimental results show that the higher levels of color depth of the background image leads to a lower success rate of the decoding capability of the blended QR code.*

Research limitations - *The current visibility of the background image is still limited although the proposed methodology is robust towards different levels of color depth. The background image in the blended QR code should be more apparent to the audience to increase the advertising effectiveness.*

Originality/value - *The proposed methodology is not found in other papers to the best of the author's knowledge in producing blended QR code.*

Keywords : color depth, decoding capability, chromatic distortion, QR code scanner.

CLAHE for Enhancement of Digitized X-Ray Films

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Abstract

Background - *Malaysia rural clinics still have X-ray facilities that produce physical films, which are sent to the nearest hospital for evaluation. Purchasing new digital X-ray facilities may not be cost beneficial, thus, a possible solution is to implement telemedicine by digitalizing the physical films so that they can be sent online to the radiologist. This can be achieved via digital photo capture. However, there can be different resolutions of the output that can produce different qualities of the digital X-ray films.*

Purpose - *The objective of this paper is to present an implementation of the Contrast-Limited Adaptive Histogram Equalization (CLAHE) techniques on digitized X-ray films that may help enhance the digital quality of the physical X-ray films.*

Design/methodology/approach - *This research collected and digitized a total of 21 physical X-ray films. These digital versions went through the process of image enhancement and compression. In this paper, the technique of CLAHE and its variations, Normalized CLAHE (N-CLAHE) and Min-Max Normalized CLAHE (MMCLAHE) were implemented. These methods introduce a clip limit to clip the histogram so as to reduce any noise amplification. Then, the enhanced images were compressed to reduce the sizes before transmission. The Fast Fourier Transform (FFT) and Discrete Cosine Transform (DCT) methods were chosen as the standard and established compression methods. Further, the Peak Signal-to-Noise Ratio (PSNR) and Mean Squared Error (MSE) measures were calculated as metrics for comparing between digitized (raw) and processed X-ray images.*

Findings - *It had been found that both CLAHE and MMCLAHE provided good values of PSNR with an average of 31dB - 32dB and produced low MSE values compared to N-CLAHE. To verify the accuracy of the digitized films, a medical practitioner was consulted for qualitative evaluation. The results indicated that the digital versions had managed to fulfill the acceptable criteria for further evaluation and there seemed to be no pathological differences observed.*

Research limitations - *It had also been found that N-CLAHE method resulted in overexposure that had masked the true diagnosis.*

Originality/value - *Comparing to other literatures, this paper had improved the digitized physical films output by introducing the CLAHE methods before compression.*

Keywords : digital imaging, image enhancement, image compression, histogram equalization, telemedicine

Subject Independent Human Activity Recognition using Multiscale Temporal Convolutional Network

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Abstract

Background - *Human activity recognition (HAR) using inertial sensors is a prevalent research topic recently. One-dimensional inertial data is preferable to image and video data because it provides non-intrusive solutions.*

Purpose - *Hand-crafted and deep learning approaches are popular in HAR. Hand-crafted approaches always require complex data pre-processing and hardcore feature extraction, resulting in high bias and crucial implicit pattern loss. Hence, deep learning approach is introduced due to its exceptional classification performance. Convolutional neural network (CNN), recurrent network (RNN), and long-short term memory network (LSTM) are extensively applied in HAR. CNN is capable of extracting spatial features and preserving localisation, but temporal feature decoding is not explicit. RNN learns temporal features, but it is susceptible to gradient vanishing and suffers from short-term memory problems. LSTM has a relatively longer-term dependency, but it requires higher computation and more memory as it stores partial results.*

Design/methodology/approach - *We propose a novel multiscale temporal convolutional network (MSTCN) based on Inception model with a temporal convolutional architecture. The multiple convolution kernels with various sizes in the inception modules are adapted into MSTCN to perform multiscale feature extraction. Dilated convolutions are applied in this network to enlarge the receptive fields without increasing the model parameters. Further, MSTCN also utilises residual connections to prevent information leakage and gradient vanishing. These three features make MSTCN possessing a longer effective history while maintaining a relatively low network computation. Unlike other HAR solutions, MSTCN only requires minimal pre-processing and no manual feature engineering.*

Findings - *Two benchmark datasets (UCI and WISDM) were used in this study. The evaluation process obeys a subject-independent protocol where there are no overlapping users between the training and testing set. The proposed network outperforms the existing state-of-the-art methods by achieving 97.52% F1 score on UCI and 94.70% F1 score on WISDM.*

Research limitations - *We may explore the imbalanced data problem to improve HAR's performance further.*

Originality/value - *An enhanced temporal convolutional network to extract spatial-temporal feature at different scales without manual feature engineering is proposed. This architecture allows a longer-term dependency and prevents information leakage.*

Keywords : Human activity recognition, smartphone sensor, temporal convolutional network, dilated convolution, one-dimensional inertial sensor

Optic Disc Localisation from Retinal Image using Vessel Masking and Hough Transform

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Abstract

Background - *Retinal images can be considered as one of the reliable indicators for symptoms of many ocular diseases such as Diabetic Retinopathy, macular degeneration and glaucoma. By analysing and tracking changes of important structures on a retinal image, symptoms of ocular diseases can be detected in a timely manner which helps physicians in planning early treatment for better disease control. One of the important landmarks on a retinal image is the optic disc, which is necessary to be localised for estimation of retinal vessel parameters such as vessel width and tortuosity.*

Purpose - *In this paper, a method for automatic optic disc localization from a retinal image is proposed.*

Design/methodology/approach - *A retinal image is first pre-processed and thresholded to produce a binary image that highlights most retinal vessels on the image. Next, a Discrete Cosine Transform-based smoothing method is employed to replace the detected vessel pixel values on the pre-processed image with values closer to the surrounding neighbour pixel values, effectively masking most vessels on the image. Hough Transform is then applied on the vessel-masked image to detect the circle representing the optic disc on the image, producing the estimated location of the optic disc center and its estimated diameter.*

Findings - *Applying the proposed method to three different public databases, namely DRIVE, HRF and MESSIDOR and a local database HUKM resulted in average detection rate of 99.54%.*

Research limitations - *The proposed method has only been validated on one type of retinal image, which is fundus image produced by fundus camera. Retinal images from other modalities such as angiogram or scanning laser ophthalmoscopy can be used to validate the proposed optic disc localisation in the future.*

Originality/value - *The achieved performance is superior to many published methods available, with processing time of less than one second for each image.*

Keywords : optic disc localization, fundus image, vessel masking, Hough transform

Enhanced Pre-processing Method for Improved Retinal Vessel Segmentation from High Resolution Fundus Image

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Abstract

Background - *By diagnosing fundus images, ophthalmologists can possibly detect symptoms of retinal diseases such as diabetic retinopathy, age-related macular degeneration, and retinal detachment. A number of studies have also found some links between fundus image analysis data to other underlying systemic diseases such as cardiovascular diseases, including hypertension and kidney dysfunction. Now that the imaging technology is advancing further, more fundus cameras are currently equipped with the capability to produce high resolution fundus images. One of the public databases for high-resolution fundus images called HRF is consistently used for validating vessel segmentation algorithms. However, it is noticed that the segmentation outputs from the HRF database normally include noisy pixels near the upper and lower edges of the image.*

Purpose - *In this study, we propose an enhanced method of pre-processing the images so these noisy pixels can be eliminated, and thus increase the overall segmentation performance.*

Design/methodology/approach - *The proposed method involves adding an additional padding to the image before the segmentation procedure is applied. In this study, B-COSFIRE filter is used for retinal vessel segmentation.*

Findings - *Qualitative assessment of segmentation results when using the proposed method showed improvement in terms of noisy pixel removal from near the edges. Quantitatively, the additional padding step improves all considered metrics for vessel segmentation, namely Sensitivity (73.76%), Specificity (97.53%), and MCC value (71.57%) for the HRF database.*

Research limitations - *This method is currently validated on only one high-resolution fundus image database. In the future, more databases will be included for validation to properly asses the robustness of the proposed method.*

Originality/value - *Findings from this study indicates improvement in the overall segmentation performance when using the proposed double-padding method of pre-processing the fundus image prior to segmentation.*

Keywords : pre-processing, retinal vessel segmentation, fundus image

Track: Information System

An Efficient Labeling Scheme for Dynamic Updates in XML Databases

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Abstract

Background - *eXtensible Markup Language (XML) is the standard for exchange of data over the World Wide Web in many application domains such as document repositories and business transactions. However, these applications are often subject to frequent data updates operations.*

Purpose - *In order to make XML into a full-featured data exchange format, it is essential to support not only queries, but dynamic updates over XML content. On the other hand, some of labeling schemes require to relabel the whole XML tree. This will be computationally costly. As such, a persistent and robust labeling scheme, which avoids re-labeling is very much desirable.*

Design/methodology/approach - *The first part of this research concentrates on designing a robust and persistent labeling scheme, which supports dynamic updates. In our approach, Relational Database (RDB) is used as the repository due to the fact that RDBs are still the most popular back-end storage in most organizations. Since XML and RDB are in different format, an efficient mapping scheme is certainly required. As such, in the second part of the research, our goal is to implement a mapping algorithm between XML and RDB. To demonstrate that our proposed labeling scheme, ORD-GAP (name after Order Gap) is robust enough for dynamic updates, we have implemented it in three use cases, namely (i) left-most, (ii) in-between and (iii) right-most insertion.*

Findings - *Experimental evaluations on several benchmark datasets demonstrated that ORD-GAP outperformed existing approaches such as ORDPath and ME-Labeling in terms of data loading time, query retrieval time and database storage size. On average, ORD-GAP has the best storing and query retrieval time.*

Research limitations - *ORD-GAP is not able to be tested on dataset size beyond 1.2GB due to the current hardware resource limitation. In addition, ORD-GAP took longer time for data loading. Nevertheless, data loading is usually executed once only as compared to query retrieval.*

Originality/value - *The contribution of our research is two-folds: (i) A robust labeling scheme named ORD-GAP that assigns certain gap between each node to support future insertion, and (ii) An efficient mapping scheme, which built upon ORD-GAP labeling scheme to transform XML into RDB effectively.*

Keywords : XML databases, dynamic updates, XML labeling scheme, mapping scheme, XML-RDB mapping

The Design and Development of Conversational Agents for Mathematics Learning

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Abstract

Background - *University classes size are usually large. Both educators and students facing the difficulties to give and get instant individualised support. Conversational agents, automated computer software that interact with human users in a text or voice based conversation through human language for various purposes, may implemented to support the teaching and learning process. Although it has been around for about 60 years but it is still in infancy for educational usage.*

Purpose - *The literature reviews gleaned from this study found that no paper proposed any educational conversational agent design and develop recipe. This paper is to propose the recipe although some steps are commonly known. The design of the agent is important so that meaningful learning and educational goals may achieve.*

Design/methodology/approach - *A pre survey on students' preferences on the system is given before the design and development process. A post survey on students's feedback about the system is given after they have used it for learning. The results from both surveys are used to proposed the recipe that cover four main aspects: technical, content, pedagogical and evaluation.*

Findings - *The proposed recipe consists of 10 steps: 1) Set the educational goals. 2) Set the learning outcomes. 3) Select an appropriate learning theory and/ or other relevant theory to develop the conversational agent. 4) Select the suitable and preferable development software and the platform to integrate it. 5) Determine the desired role of the conversational agent, such as a lecturer, tutor, etc. 6) Prepare the lesson content. 7) Prepare multimedia resources library to link to external information, such as websites or videos, as part of the learning materials or activities. 8) Design the instructional and dialog flow. 9) Develop the conversational agent. 10) Test the developed system.*

Research limitations - *The proposed recipe is only limited to educational agent development for undergraduate subjects, specifically mathematics.*

Originality/value - *It may serve as a guideline to design and develop educational conversational agent.*

Keywords : conversational agent, mathematics learning

WBCs-based Segmentation and Classification on Microscopic Images: A Minor Improvement

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Abstract

Background - *White blood cells (WBCs) are immunity cells to fight against viruses and bacteria in human body. The captured WBCs microscopied images for processing and analysis are important to interpret the body condition. At present, there is no robust automated method to segment and classify WBCs images with high accuracy.*

Purpose - *This paper aims to improve on WBCs image segmentation and classification method. Triple thresholding method is proposed to segment the WBCs; meanwhile, a Convolutional Neural Network (CNN) based binary classification model that adopts transfer learning technique is proposed to detect and classify WBCs as a healthy or a malignant.*

Design/methodology/approach - *The input dataset of this research work is the Acute Lymphoblastic Leukemia Image Database (ALL-IDB). The process first converts the captured microscopied images into HSV format for obtaining the H component. Filtering is applied to reduce noises in the image. Otsu thresholding is applied to segment the WBCs area. A 13 x 13 kernel with two iterations is used to apply morphological opening on image for better output results. Collected cell mask are used to detect the contour of each cell on the original image. To classify WBCs into a healthy or a malignant category, characteristics and conditions of WBCs are to be examined. A transfer learning technique and pre-trained InceptionV3 model are employed to extract the features from the images for classification.*

Findings - *The proposed WBCs segmentation method yields 90.45% accuracy, 83.81% of the structural similarity index, 76.25% of the dice similarity coefficient and it is efficient in computation. The accuracy of fine-tuned classifier model for training, validation and test sets are 93.27%, 92.31% and 96.15% respectively.*

Research limitations - *The obtained results still have a lot of rooms for improvement. More training may be needed to strengthen the proposed method.*

Originality/value - *This paper has proposed triple thresholding for segmentation, and transfer learning technique and pre-trained InceptionV3 network for classification of WBCs into a healthy or malignant category. The obtained results are high in accuracy and precision are over 96% and with lower loss value.*

Keywords : Microscopic Images, Image Processing, White Blood Cells, Convolutional Neural Network, Image Segmentation.

Driver Perceptions on Advanced Drive Assistance Systems: A Case Study

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Abstract

Background - *Automobile manufacturers have progressed towards providing advanced driver assistance systems (ADAS) which provides information, warnings or alerts, navigation assistance and etc. for better user experience and supporting drivers' decision making process, especially in avoiding unfavourable outcomes due to human limitations. Automobile manufacturers need to have an insight and understand how consumers specifically drivers respond to the technology in their manufactured vehicles.*

Purpose - *This study looks into the drivers perspective towards the ADAS in relation to protecting the driver from dangerous situations.*

Design/methodology/approach - *A survey instrument was design for this purpose and distributed using convenience sampling to get responses from licensed drivers. Questions include a variety of demographic and driving questions, the perceptions of benefits and obstacles relevant to the use of V2V safety applications, vehicle decision-making, and technology use. The data was collected from 818 respondents who are licensed drivers in Malaysia. Results were then analysed using statistical approaches.*

Findings - *The findings of this study indicate that 76.8% drivers have positive attitude of towards V2V technology, in particular safety applications, when it is available. Regardless of the accuracy of these systems, acceptance of the technology may shift upon viewing or hearing messages of possible problems. However, the safety advantages of V2V technology are less valued by drivers who do not have experience with road accidents. Furthermore, 33% of the drivers have the assumption that the safety applications could be compromised which may affect their acceptance towards the technology.*

Research limitations - *Using convenience sampling, the result cannot be generalised to all licensed driver. The response provided by the respondents are also influenced by their experience with modern vehicles which are equipped with ADAS.*

Originality/value - *This study reveals drivers perceptions towards advanced driver assistance system in Malaysia context which is currently lacking from the literature. So far, other studies focused on countries which are not similar to Malaysia's multi-culture environment. This may provide insights to automobile manufacturers and support national initiative towards autonomous vehicle.*

Keywords : V2V, safety applications, road safety, collision avoidance, ADAS

A Timetabling Method for University Online Classes

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Abstract

Background - *The prolonged COVID-19 pandemic compels many universities to continue offering online classes rather than physical classes. Traditional timetabling methods have to address the constraints of physical classrooms in terms of availability of classrooms and class size which often results in a longer school hour per day or forgoing a proper lunch break hour in order to accommodate more classes.*

Purpose - *The paper presents a timetabling method that takes into account online classes are more relaxed in terms of the availability of physical classrooms which means more classes could be conducted concurrently. It therefore provides an opportunity to produce a timetable with a shorter school hour per day.*

Design/methodology/approach - *The timetabling method we proposed combines graph coloring algorithm and backtracking algorithm. The graph coloring algorithm is first applied to the class data to produce a timetable that does not vialate hard constraints such as a lecturer or a student cannot attend more than one class at a time. The timetable is then passed to a backtracking algorithm to solve two soft constraints: a lecturer shall not have two continuous teaching slots, and the lectures of a course should be conducted before tutorials or laboratories.*

Findings - *Two trimesters of real faculty timetables are used for testing. The total number of classes are 182 and 183 respectively. The original timetables required five two-hour class slots per day to fully schedule all classes, without any designated lunch break hour, and some courses have lectures after tutorials or laboratories. The proposed method could produce within minutes different versions of timetables with four two-hour class slots per day, a designated one-hour lunch break, and all courses have lectures before tutorials or laboratories.*

Research limitations - *The proposed timetabling method does not attempt to distribute the classes evenly for students across the school days. There is a possibility of students having many classes on some days while few classes on other days.*

Originality/value - *There are many research papers that solved hard constraints. This paper presented a method that solves both hard constraints and two stated soft constraints.*

Keywords : course timetabling

Resource Description Framework (RDF) Reification in Knowledge Graphs

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Abstract

Background - *Machine-readable representation of knowledge on the Web is achieved through knowledge graphs. Structured data in the knowledge graph is published using Resource Description Framework (RDF) where knowledge is represented as a triple (subject, predicate, object). Due to the presence of erroneous, outdated and conflicting data in knowledge graph, the quality of facts cannot be guaranteed. Therefore, provenance of knowledge can assist in building-up the trust of these knowledge graphs.*

Purpose - *In this paper, we have provided an analysis of popular, general knowledge graphs Wikidata and YAGO4 with regard to the the representation of provenance and context data.*

Design/methodology/approach - *Since RDF does not support metadata for providing provenance and contextualization, an alternate method, RDF reification is employed by most of the knowledge graphs. RDF reification provides additional information in the form of RDF statements about RDF statements. Different representations exist in different knowledge graphs to adhere to RDF reification.*

Findings - *Wikidata relies on RDF reification extensively to store information such as temporal information, validity of facts and other additional information pertaining to facts. In Wikidata, contextual information is attached directly to the facts using qualifiers. Wikidata attaches source of the information using references. Rank is provided to identify the most important statement. YAGO4 uses RDF* model for employing RDF reification and the annotations of facts are collected from Wikidata qualifiers. YAGO4 employs separate-assertions mode for attaching time validity of facts.*

Research limitations - *RDF Reification increases the magnitude of data as several statements are required to represent a single fact. Thus, results in complex queries for retrieving information. However, facts in Wikidata and YAGO4 can be fetched without using reification. Another limitation for applications which uses provenance data is, not all facts in these knowledge graphs are annotated with provenance data.*

Originality/value - *Structured data in knowledge graph is noisy. Therefore, reliability of data in knowledge graphs can be increased by provenance data. In this paper, we have explored how the trust of facts are enriched by contextualization, the data model and the extent of contextualization covered by Wikidata and YAGO4 and how it can be accessed from these knowledge graphs.*

Keywords : Wikidata, YAGO, RDF reification, Knowledge Graph, provenance data

Student's Learning Experiences and Perceptions of Learning Programming Online

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Abstract

Background - *Numerous studies were conducted on teaching and learning of programming subject as online learning, yet many questions remain unanswered, especially about the viability of online learning especially from the students' perspective. The purpose of this study is to investigate students' learning experiences of learning programming in an online environment and identify their perceptions while receiving the knowledge online. The findings are beneficial to universities to improve the students' learning experiences and instructors to understand the students' perceptions towards learning programming online and improve their teaching online practices.*

Purpose - *The purpose of this paper is to investigate the students' learning experiences and their perceptions towards learning programming languages in an online environment.*

Design/methodology/approach - *A case study approach is adopted in this study. The data was collected over a period of two weeks by using an online survey. The students, who were just finishing their online classes and having their trimester break, were invited through electronic mail to voluntarily participate in the survey. Out of 144 students invited to participate in the online survey, 78 took part in the survey.*

Findings - *The following findings are based on the result of the questionnaire conducted in the study. First, 91% of the students showed positive perceptions towards learning programming languages in an online environment. Second, the students' learning experiences were divided into two clusters which were positive and negative learning experiences. Positive learning experiences: self-paced learning, time and cost saving, availability of recorded lectures, convenience and efficient, prevention of Covid-19, ease of participation and develop self-discipline. Negative learning experiences: lack of self-discipline, less student-to-instructor interactions, computer and Internet problems, lose focus easily, less student-to-student interactions and less supervision from instructors.*

Research limitations - *Few limitations are noticed in this study. First, 64% of the students in this study were new students and to complete all classes in an online learning. Thus, this situation might influence the students' perceptions towards learning programming in online learning environment. Second, a small sample were not adequate to represent large group students' perceptions.*

Originality/value - *This study captures student perceptions and learning experiences of learning programming, particularly in C++ language in an online environment.*

Keywords : Online learning, online programming, student perceptions, learning experiences

Dataset Enrichment using Ontology in Hybrid Recommender System

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Abstract

Background - *A recommender system captures the user preferences and behaviour to provide a relevant recommendation to the user. In hybrid model-based recommender system, it requires a pre-trained data model to generate recommendations to a user.*

Purpose - *Data quality plays the important role in data model training. With an ontology constructed in the data model, it helps to structure the data in a way that the entities are connected with each other within the database. With this, the semantic relations within a particular domain have higher expressivity.*

Design/methodology/approach - *Our focus in this research is using ontology to enrich the training dataset information. We enhanced the matrix factorization model accuracy by utilizing ontology to enrich the information of user-item matrix by combining the item-based and user-based collaborative filtering techniques. In particularly, the combination of enriched data, which consists of sematic similarity together with rating pattern will helps to reduce the cold start problem in the recommender system. The enriched data will then be passed to the matrix factorization model to produce the personalized recommendation.*

Findings - *In the experimental evaluations, the Movielens 100k dataset has been selected as it is the widely used dataset for benchmarking purposes. We compare our system to a baseline method and existing method. The baseline method is using Singular Value Decomposition (SVD) only while the existing method is using item-based collaborative filtering techniques and SVD. In contrast to the existing method, the user-based collaborative filtering technique has been added to the matrix filling process.*

Research limitations - *This limitation of this research would be the computational cost. The filling matrix process filter and find similar users or items then predict the rating. The computational time increase as data goes larger. However, algorithm optimization can be carried out and this process is done offline which would not affect the online recommendation performance.*

Originality/value - *Our proposed method has reduced the data sparsity from 0.9542% to 0.8435%. Besides that, It shows that our proposed method has achieved better accuracy which is Root Mean Square Error (RMSE) 0.9298, as compared to the baseline method (RMSE: 0.9642) and existing method (RMSE: 0.9492).*

Keywords : Information Retrieval, Ontology, Recommender System, Collaborative Filtering, Hybrid Recommender System

Students Perception on Incorporation of Conversational Agents in Mathematics Learning

Choo Peng Tan[1], Choo-Kim Tan[2]

[1,2]Multimedia University

Abstract

Background - *In a learning process, educator could know the understanding of a student by reviewing solution of given problems solved by student and interacting (question and answer) through conversations. These type of open-ended human-to-human conversations could definitely provide a great success in teaching and learning process. However, it is not easy to practice in a large scale class as most of the university classes are large size. Conversational agents, automated computer software that interact with human users in a text or voice based conversation through human language for various purposes, may implemented into education to support the teaching and learning process.*

Purpose - *This paper is to discuss students' perceptions on incorporation of the developed conversational agent in their mathematics learning.*

Design/methodology/approach - *The developed system is incorporated to an IT undergraduate mathematic subject where the students were self-registered it. The students were brief and used to this agent for learning outside the classroom for a month at the same time when they were taught by the lecturer in face-to-face classes. An adapted questionnaire with 5 Likert-scale on perception toward this incorporation was distributed to students after they have done the learning with the system.*

Findings - *The findings indicate a favorable response towards this incorporation as they were first time experiencing it in learning. Majority of the students perceived positively on the aspect of students' understanding of Mathematics concepts. They feedbacked that the learning experiences with conversational agent are fun and interesting.*

Research limitations - *The study is only limited undergraduate Mathematics subjects. Hence, the results can only be generalized to universities mathematics learning.*

Originality/value - *The findings may provide more insight on a more effective incorporation of educational conversational agent.*

Keywords : conversational agent, chatbot, mathematics learning, students perception

Effects of Screen Size on E-Learning Productivity: An Evidence from Malaysia's University Students

Tze Hui Liew[1], Lau Siong Hoe[2], Hishamuddin Ismail[3]

[1,2,3]Multimedia University

Abstract

Background - *The landscape of higher education had been totally changed, from traditional physical face-to-face teaching and learning, the online classroom has now been the primary source of education for university students in Malaysia. In fact, with expansions in online learning technology, most of the restriction may be solved, but what about the effects of screen size has on online learning productivity and performance? Limitations of online learning can vary depending on the instructors' or students' technological abilities to access the right technology, especially the right screen size.*

Purpose - *The purpose of this paper is to validate the university student's online learning performance framework and the key design factors that are important to enable a positive Online Learning experience based on different screens size.*

Design/methodology/approach - *This study employed a Task Fit-based UTAUT model and questionnaire to collect self-reported data from the university students to explain the relationship between the online learning performance and the variable of screen size.*

Findings - *A total of 1765 students participated in this study. The results indicated that the best performance screen size for online learning among university students is the Laptop, which equivalent to 70.6% of the total usage. The findings showed that the 15.6- laptop is the most commonly used screen size for online learning among university students. The study revealed that the students may easily be confused due to limited viewing screen area to keep their attention, which may lead to perceptual errors, and this is the main reason why mobile and tablet received low low usage for online learning.*

Research limitations - *This study only focuses on gathering data from university students from one university and using the same online learning platform namely Google Meet. It's recommended to include teachers' and parents' data in future studies to draw a more comprehensive conclusion.*

Originality/value - *Previous work had exhibited that screen size affects the overall usability of an interactive device, however, no work has explicitly explored the effect that screen sizes have on online learning thus far. This study discussed the important of access to the right screen size has on online learning within Malaysia's context.*

Keywords : Screen Size, Online Learning, University Student, Task Fit, UTAUT

Child-Computer Interaction and Screen Size: What does Malaysia's Pre-School Children Say?

Tze Hui Liew[1], Lau Siong Hoe[2], Hishamuddin Ismail[3]

[1,2,3]Multimedia University

Abstract

Background - *Screen size does not only imply a certain resolution but also a fundamentally different user's experience in design, navigation, and physical interaction. Screen size had major effects on consuming content and performing tasks during the online learning sessions. The issue of unfitting screen size becomes a big challenge in online learning performance with increased cognitive load, split attention span, and increased difficulty in completing exercises and tasks.*

Purpose - *In view that online learning is now a new norm in pre-school children's learning ecosystem, the purpose of this study is to investigate the effect of screen size has on online learning and a framework to recommend the best practice screen size for pre-school children to interact with computers.*

Design/methodology/approach - *An experiment based on Fitts' Law named Catch-the-stars had been employed to investigate the screen size that best suits pre-school children with two types of screen size, specifically tablet and all-in-1 desktop PC. Each participant is required to touch the stars that appeared on the screen randomly until the count of 18. A total of 25 pre-school children had participated in the experiment for the period of 2 months.*

Findings - *The results indicate that screen size was an important factor that influences the quality of child-computer interaction and the effectiveness of online learning among pre-school children. The study revealed that tablet screen size is the best screen size for pre-school children to interact with computers. Further, 23 out of 25 pre-school children involved in the study indicnated that they are more comfortable with tablets. The experiment further validated that pre-school children perform better with tablets compared to desktops.*

Research limitations - *The sample size of this study is focused on pre-school children and the number of participants is relatively small. In order to gather solid evidence that can be generalized, it's recommended to include participants from different educational levels and to at least collect 150 responses from each group of participants.*

Originality/value - *This study suggested that screen size is critical to the success of effective learning and the performance of child-computer interaction was varied based on different screen sizes.*

Keywords : Screen Size, Child-Computer Interaction, Online Learning, Pre-school Student, Fitt's Law

An Empirical Study on the Impact of Virtual Learning on Multimedia University Student Performance.

Hen Toong Tai[1]

[1]Multimedia University Malaysia

Abstract

Background - *The Covid-19 pandemic has imposed the learners and educators across all levels of education in the world to expeditiously adapt to virtual learning. Nevertheless, the effectiveness of virtual learning varies amongst age groups. There are many believes that the adoption of virtual learning will continue to implement even after pandemic particularly in higher education.*

Purpose - *It is crucial to validate the effectiveness of virtual learning approach among university students, to ensure a smooth transition from conventional education model to hybrid education model. Thus, this paper aims to evaluate the factors affecting virtual learning and its impacts towards students' performance in virtual classroom.*

Design/methodology/approach - *The study involved data analyses using SPSS to analyse the survey data collected from undergraduate students in Multimedia University. The sampling technique applied for this study was convenient sampling technique. For data collection purpose, self-administered online surveys was applied in this study. A total of 210 diploma students responded to the online surveys. As for data analyses, the statistical technique applied in the context of this study was multiple regression analysis.*

Findings - *Based on the feedbacks from students' surveys, the findings of this study provided understanding on the factors affecting virtual learning together with the impact on students' performance in virtual learning environment. The factors affecting virtual learning were segregated to three categories, which are: virtual teaching techniques, technology and environment distraction. Based on the results, the respondents stated that the critical factors that affect the effectiveness of virtual learning are giving as in sequence with: (1) technology, (2) virtual teaching techniques and (3) environment distraction.*

Research limitations - *This study is limited to students from Multimedia University. It lays the groundwork for future research to involve students from other universities or other countries. Moreover, the future study can address more factors which affect virtual learning and students' performance such as students' attitude and motivation.*

Originality/value - *The findings of the research are helpful for academicians to design online learning delivery methods by applying the effective teaching styles in virtual classroom. Besides, this study addresses the importance of technology used in virtual classroom which is impactful to students' performance.*

Keywords : Student Performance, Hybrid Model, Virtual Learning, Factors Affecting Virtual Learning

Typographic Error Detection in Conversational Agent Development

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Abstract

Background - *A conversational agent is a communication tool which use textual methods to provide instant response on peoples queries. Most existing conversational agents can only handle proper input queries without typographical error, which include spelling errors or abbreviation.*

Purpose - *Therefore, in this paper, we presented Edit-distance and N-gram, as an integrated method to handle this problem where people may input their queries with a typographical error. Using the proposed algorithm, input variation mistake is recognized and the conversational agent will be able to improve the quality of its response.*

Design/methodology/approach - *Once a user inputs the query, the sentence will be compared to the correct words that are available in the corpus. If the corpus is big, it will take a longer time to process. Therefore, to overcome this problem and to gain a fast comparison, the hash map is used. Currently, if the word in the corpus is different from the input word, it is treated as an error, thus, edit distance is integrated with n-gram to solve this. Edit-distance is a comparison between the pairs of strings used to determine the characters needed to modify from one string to another string. N-gram based approach is proposed to create the candidate words. A consecutive sequence of candidate words or phrases is generated for the proposed method based on the word error. Next, all the index from the corpus that has an overlap of the error words is retrieved using the Jaccard coefficient. Based on the probabilities of words, distance is calculated, whereby the candidate with the lowest distance value will be used to replace the erroneous word.*

Findings - *In this paper, we have presented edit-distance and n-gram analysis, as an integrated methodology to improve the response of the conversational agents. Besides that, we have improved the searching method in the corpus using h-map.*

Research limitations - *This research is limited to typographical error only.*

Originality/value - *For demonstrating the use of the proposed algorithm, a test is conducted on students' dataset with 150 sentences. The empirical results have shown that the proposed approach is able to handle input variation mistakes with 92% accuracy.*

Keywords : Conversational Agents, Spelling Error, Edit-Distance Method, N-gram

Adaptive Learning for Schools in Malaysia

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Abstract

Background - *This paper is a proposal to describe the adaptive learning influence in schools in Malaysia. The adaptive learning system suggested as both application and website approach. The goal of the research is to foster authentic learning, spreading digital fluency and improve the teaching profession.*

Purpose - *In this research, a new adaptive learning system will be designed to cater the needs of students in both primary and secondary school. Since the last decade, students are exposed to technology in their teens when they enter higher education.*

Design/methodology/approach - *The proposed framework consists of six major features and their respective descriptions. The proposed features are content, gamification, alert, live chat, parent-teacher room and newsfeed. The features stated are carefully studied on their pros and cons and is concluded that it suits best for effective learning environment.*

Findings - *With an influx of new learning methods, education methods are bound to evolve in the coming decades. Students given an earlier approach in technology will boost their skills and learning approach. Developing a modern learning system is relatively a common approach in this decade. Despite it is common, an adaptive learning system is yet to be implemented in schools. Every individual has different learning ability and technology allows educators and, in this case, through adaptive learning to accommodate unique learning styles on modernized basis. Students are usually exposed to the same content equally and tested on the contents given. Now, adaptive learning accommodates each student need by giving selected contents.*

Research limitations - *The research focuses on the syllabus from government primary and secondary schools in Malaysia. However, internet connectivity and availability of tablets, laptops or smart phones are the limitations need to considered when dealing with rural schools.*

Originality/value - *This whole new implementation leads to a new diversified learning environment and a positive approach in school learning. The learning system which will be developed by this proposal can be adaptive to students' learning style in Malaysia and provides the opportunity of an adaptive learning system that is a current approach in the field of education now.*

Keywords : Adaptive Learning, learning system, different learning ability.

Model-Based Data Generation and Customer Simulation of Point-of-Sales Transactions

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Abstract

Background - *Customer purchase transactions at the Point-of-Sales counter of a retail store consists of two main tables – customer purchase orders and order items of each transaction. Actual transaction data of these tables are usually not organized or well-formed to conform to formulaic distributions such as uniform and normal distributions. Thus it is difficult to use actual data for demonstrations or visualization purposes.*

Purpose - *This research project studies the possible models of the transactional data from a Point-of-Sales counter, and develop algorithms to generate simulated data for the transactions that could occur at the counter. The project also develops visualization and simulation functions to demonstrate the generated transactions.*

Design/methodology/approach - *A set of algorithms was developed to generate Point-of-Sales transaction data based on a set of parameters such as number of customers, types of customers, store operational hours, and distribution patterns such as uniform or normal distributions. The data is then loaded into a simulation module that visualizes the data through a dashboard and a time-based animation of the customers at the Point-of-Sales counter. Two main modules were developed – Generation Module and Simulation Module. The Generation Module can be used to generate a variety of datasets for demonstration and visualization purposes, and the Simulation Module can be used to load and visualize actual transaction data and run simulations.*

Findings - *Initial generation process produced transaction data of 50 customers with uniform distribution across 5 days. The data was successfully visualized and animated in the Simulation Module. Subsequent processing generated data for up to 2000 customers for 5 – 10 days, with uniform and normal distributions, and 3 types of customer profiles. The visualization and animation of the generated transactions successfully demonstrated the Point-of-Sales activities.*

Research limitations - *Actual transaction data are expected to be distributed in a more complex distribution, which require further analysis. Additional parameters could be added to the modelling such as number of counters and product categories.*

Originality/value - *The algorithms to generate simulated transactions incorporate variations such as customer types (small to large transactions), store parameters (operation hours and days), and generate the distribution according to the required patterns.*

Keywords : Transaction Modelling, Data Generation, Customer Simulation, Point-of-Sales Transactions

Students' Perception Towards Learning Agent

Tan Choo Kim[1], Clara A/P Susaie[2]

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Abstract

Background - *Over the years, many changes have taken place in education sector. However, the interest in studies by students to learn seem debateable. Involving technology during the deliverance of teaching would make students to stay focused and pay attention. If food can automatically deliver to respective customer's house, there must be an effective way to provide friendly learning environment for students. Implementing a human life like character in studies would create fun and effective learning environment for students. Pedagogical agents are the virtual characters designed for the purpose of online learning. In this study, the idea of implementation of pedagogical agent is in the blended learning environment. Blended learning is the integration of conventional approach and online learning method.*

Purpose - *The purpose of the study is to determine students' preference of pedagogical agent in blended learning environment on whether their performance on studies can be improved.*

Design/methodology/approach - *A set of questionnaires was designed for collecting quantitative data from the students on their opinions of pedagogical agent in blended learning environment. The questions are rated with 5 points Likert scale. 50 undergraduates from a university involved in this study. The questionnaires have been validated and checked for its reliability.*

Findings - *The results show that 70.4% of the students are unaware of the existence of pedagogical agent. About 66.7% stayed neutral on their opinion when they were asked about whether they like to learn if the pedagogical agent teaches them in blended learning method. Besides, 70.4% of the students stayed neutral when they were asked whether they can perform better in their studies if pedagogical agents teach them in blended learning environment. Only 20.4% of them agreed that they can perform better with the existence of the pedagogical agents.*

Research limitations - *The limitation of the study is only undergraduates involved. Thus, the findings can only be generalized to university students and cannot be generalized to other educational settings and approaches.*

Originality/value - *The study provides the importance of pedagogical agent in blended learning for the effectiveness of studies. Through this study, the educators may amend the delivery of teaching accordingly.*

Keywords : Pedagogical Agent, Blended Learning

Effects of Learning Agent Approach on Students' Mathematics Anxiety

Tan Choo Kim[1], Khoo Huai Swan[2], Tan Choo Peng[3], Cheah Wooi Ping[4]

[1,2,3]Multimedia University, [4]University of Nottingham Ningbo

Abstract

Background - *The use of technology in mathematics teaching and learning had reported positive impacts and claimed to be able to reduce students' mathematics anxiety efficiently.*

Purpose - *This study was to determine the effects of learning agent on alleviating students' mathematics anxiety.*

Design/methodology/approach - *The study adopted quasi-experimental study with non-equivalent control group design with pre-test and post-test design on a sample of 73 students. The sample were divided into control group and experimental group. The control group learnt with the conventional approach and the experimental group learnt with the learning agent approach. Quantitative data was collected using the Mathematics Anxiety Rating Scale (MARS). MARS measures students' mathematics anxiety levels of both control and experimental groups before and after the experimental period. Qualitative data was collected from interview with students at the end of the study. Instruments were reviewed and validated by experienced lecturers and reported with good reliability coefficient of .89. The mathematics syllabus and lessons with example questions were same for both groups.*

Findings - *Students in the experimental group had significantly decreased their mathematics anxiety after the study, whereas the control group had significantly increased their mathematics anxiety after the study. This indicates that the conventional approach had increased students' mathematics anxiety, whereas the learning agent approach had reduced students' mathematics anxiety. The result recorded by the control group is consistent with previous studies that learning with conventional approach are more likely to promote or expose students to the factors that caused mathematics anxiety, such as mismatch learnings, negative experiences in the class, and are shy to ask questions. The learning agent approach enables students to learn with a one-to-one session at their own pace without worrying with their previous negative experiences with conventional approach. Majority of the students described their learning experiences with learning agent as interesting and fun.*

Research limitations - *The study is limited to undergraduates only. Therefore, the findings can only be generalized to tertiary levels of mathematics learning. Future research could be conducted on primary and secondary school students.*

Originality/value - *The findings from this study will provide more insights on a more effective implementation of learning agent in education.*

Keywords : Learning agent, Mathematics anxiety

Impact of Incorporation of the Virtual Agent on Mathematics Learning

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Abstract

Background - *One of the students' learning obstacles is mathematics subject, which also increases the dropping out of university rate. Since mathematics is an essential subject and enables students to develop the analytical and computational skills that are needed for their specialisation areas, many efforts had been done to improve students' mathematics learning.*

Purpose - *The aim of this study was to investigate the impact of incorporation of the virtual agent on mathematics achievement.*

Design/methodology/approach - *The non-equivalent control group design with pre-test and post-test was adopted because randomization was impossible. The primary dependent variable was the mathematics achievement, while the independent variable was the approach of instruction. Both pre- and post-achievement tests were administered to the control and experimental groups before and after the intervention course. The virtual agent learning system was incorporated into the teaching and learning for the experimental group, whereas the conventional approach for the control group during the intervention course.*

Findings - *The sample was from a university in Malaysia. There were 30 students in the control group and 43 students in the experimental group. The t-test was run at 5% significance level for the comparation of mean in mathematics achievement between the control and experimental groups before and after the intervention course. There was no significant difference in the mean scores between the experimental and the control groups before the intervention period. This indicated that students of both groups achieved at the same level of mathematics achievement before they were exposed to different approach of instruction. However, both groups' mean scores in achievement after the intervention course were significantly difference. The experimental group showed a significantly better achievement than their counterparts. This showed that the virtual agent learning system approach is significantly a better approach for improving students' achievement in mathematics.*

Research limitations - *The data collection was via the achievement test only. More findings could be generated if more methods are used.*

Originality/value - *The favourable finding leads to the recommendation to mathematics educators that the virtual agent learning system approach could be adopted in their teaching to improve students' achievement in mathematics. It is suggested that the research scope could be extended to other subjects.*

Keywords : virtual agent, virtual agent learning approach, mathematics achievement

Track: Information Technology

Incorporating of Augmented Reality Technology in Teaching and Learning Vectors

Tan Sin Yin[1], Noel Tay Nuo Wi[2]

[1,2]Multimedia University

Abstract

Background - *During Covid-19 pandemic, education systems are greatly affected due to lockdown. Teaching-learning is forced to change to fully online lessons, with full support from Ministry of Education Malaysia to adapt this new norm.*

Purpose - *Through conventional teaching with white board or PowerPoint presentation, educators face challenges to illustrate vectors and planes to students, especially when involving more than 2 dimensions. Hence, Augmented Reality (AR) technology is introduced to support them in their online teaching-learning process in this study. From literature review, most AR systems are developed for mobile apps. However, limited works had been done for online class domain. Therefore, a new Vector PC AR system (VPCAR) is proposed in this study to aid in teaching-learning process.*

Design/methodology/approach - *Vectors' learning module is developed for PC, where vectors are illustrated in 3 dimensional coordinate system by using AR technology. Non-probability sampling is applied in selection of target population due to Covid-19. Educators and students will view a short demonstration and provide feedback in terms of visualization, interface attractiveness, inspiration and understanding of vectors through a list of questionnaire. Likert-type data is recorded to measure the supportiveness of AR technology in teaching-learning. Then, descriptive result will be presented graphically.*

Findings - *The descriptive analysis reveals a significant positive feedback towards teaching-learning process from educators and students. From students' perspective, the colourful AR interface may attract their attention, improve their visualization and strengthen their conceptual understanding of vectors by moving their webcam to view the vectors from different perspective. Additionally, majority of educators fully support this technology compared to the use of conventional way. They strongly believed the interactive and engaging activities may stimulate the students' motivation in learning, which is certainly beneficial to students.*

Research limitations - *This study may not represent the whole population in Malaysia as non-probability sampling is applied. Most the respondents are from private institute since it hardly reaches government institute students and educators. Further work will focus on secondary government school because vectors.*

Originality/value - *Some learning module had been developed in AR mobile Apps by other researcher but the comparative feedback among educators and students towards VPCAR system is novel.*

Keywords : Augmented Reality, Learning Vectors, Teaching and Learning, Online Class

Augmented Reality Emotion Recognition for Autism Spectrum Disorder Children

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Abstract

Background - *Autism Spectrum Disorder (ASD) is a lifelong neurodevelopmental disorder which affects the brain development. The prevalence of ASD is one in sixty-eight children. These children are suffering from a reduced ability in social communication. Existing literature suggested that low social motivation is the main cause in developing social communication skills deficiency as ASD children hardly focus on social information such as other people's emotional behaviors and faces. They are less likely to feel pleasant when interact with others as they often struggle in understanding and responding to emotions. As a result, it is becoming difficult for them to express themselves to manage social interactions even though they have the genuine intention to develop friendships. They may also lack the ability to comfort others or even share their own feelings.*

Purpose - *The aim is to design a mobile application based on Augmented Reality (AR) focusing on social interactions and communication aspect for children with ASD. The scope is in emotion recognition, which make use of emotional icons (emojis or emoticons) to help them improve their social skills, more specifically on helping them to recognize various emotions.*

Design/methodology/approach - *The emotions are represented by emojis inspired by Dr. Paul Ekman who has created the basic six emotions in the Emoji Recognition Chart, namely happiness, sadness, disgust, fear, surprise and angry. Additional emotions such as confound face, winking with tongue, cold sweat, blowing kiss, flushed, sleepy, disappointed and winking are included. A predefined area has to be set to trigger the AR feature. The scripting is based on C# programming and Unity software.*

Findings - *AR is able to gauge the children's attention when they view the animated emojis in the self-defined plane area. The scene can be snapshot to be saved in the photo album. The application enables the ASD children to be more willingly in recognizing different emotional expressions and improve their social skills by expressing their own feelings.*

Research limitations - *The scope of the study is limited to emotion recognition. It is developed based on literature reviews without guidance of any certified ASD specialist.*

Originality/value - *AR is an interactive technology which places digital information in our physical world in real time, providing precise registration in all three dimensions. Existing literature proved that the traditional face-to-face teaching methods have failed to increase the interest and ability of ASD children because the teacher is having full control in the classroom. This study adds value to the existing works to incorporate AR as additional intervention in treating ASD children.*

Keywords : augmented reality, autism spectrum disorder, emotion recognition, emoji

Boneh-Boyen Identity-Based Signature

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Abstract

Background - *One may transform one type of cryptographic scheme to construct another type of scheme. The goal is to produce a new scheme which inherits the security of the originating scheme. The Fiat-Shamir transform enable the construction of a digital signature scheme from an identification scheme. The security of the new digital signature scheme achieves unforgeability under chosen message attack if the identification scheme is secure from impersonation under passive attack. The Fiat-Shamir transform has been extended for identity-based schemes.*

Purpose - *To construct an identity-based signature scheme which achieves existential unforgeability against chosen message attack based on Boneh-Boyen digital signature scheme.*

Design/methodology/approach - *The Boneh-Boyen scheme is chosen as the base scheme because it produces shorter signatures while being secure in the standard model. In addition, Kurosawa and Heng have constructed an identity-based identification scheme using the Boneh-Boyen digital signature scheme. So, we applied the extended Fiat-Shamir transform on Kurosawa-Heng identity-based identification scheme to produce an identity-based signature scheme.*

Findings - *Our application of the Fiat-Shamir transform on the Kurosawa-Heng identification scheme has successfully resulted in an identity-based signature scheme which inherits the security of the Boneh-Boyen signature scheme. Specifically, the new scheme achieves existential unforgability against adaptive chosen message attack in the standard model given that the hash funcation used is collision- and the strong Diffie-Hellman assumptions holds.*

Research limitations - *However, to achieve that level of security for the identity-based signature scheme, the identity-based identification scheme must be secure against active attacks. Consequently, the public key and signature of the resulting scheme is larger than in the originating digital signature scheme.*

Originality/value - *This work demonstrates that the Fiat-Shamir transform can produce identity-based signature while inheriting the identity-based identification scheme's security in the standard model.*

Keywords : identity-based signature, identity-based identification, Fiat-Shamir transform, standard model

Post-Pandemic E-learning: A Conceptual Study on the Integration of Mobile VR and VARK Learning Style

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Abstract

Background - *The Covid-19 pandemic has resulted in an abrupt but accelerated shift to e-learning worldwide. Education in a post-pandemic world has to amalgamate the advantages of e-learning with important pedagogical goals associated with in-person teaching. Although various advanced technologies are present at our fingertips today, we are still unable to use their full potential in teaching and learning. In this regard, mobile VR technology is both cost-efficient, versatile and engaging for students*

Purpose - *This paper renders a conceptual framework that will allow an integration between e-learning and mobile VR supported by the principles of VARK (Visual Auditory Reader/writer Kinesthetic) learning styles. Its purpose is to enhance the effectiveness of e-learning by integrating VR and VARK learning styles.*

Design/methodology/approach - *First, relevant pieces of literature have been purposefully reviewed to find out the gaps regarding the relationships between e-learning, mobile VR, and learning styles and get to a framework that integrates mobile VR and the VARK learning style. For a fuller study, a medium cluster of students can be selected for data collection from the same age group under the K-12 curriculum. The mixed-method data collection can aim to find the degree of engagement, motivation and satisfaction of the learners' learning in the mobile VR assisted e-learning context.*

Findings - *The literature review shows that with the recent surge in VR-compatible smartphones, VR is quickly becoming a familiar name. Despite having a significant impact on student engagement and performance, mobile VR is greatly neglected in terms of education. The proposed framework is thus deemed feasible to be continued for fuller studies with adequate empirical data.*

Research limitations - *To propose the said mobile VR in conjunction with VARK learning styles framework, literature has been reviewed mainly from the sources that focus on the Asian context. For drawing a more generalized conclusion as the framework deserves, more literature could be added that related other parts of the world.*

Originality/value - *Various researches highlight the relationship between different learning styles and VR but there is very little research on the latter's subbranch known as mobile VR and its usage in terms of e-learning. The conceptual framework is expected to bring the required focus on mobile VR and its potential usage in e-learning which is expected to greatly aid students belonging to more practical oriented disciplines of study or those with a more visual or kinesthetic learning style.*

Keywords : E-Learning, Mobile VR, Learning Style, Post-Pandemic Education

Track: Artificial Intelligence (outline)

An Amalgamation of Fuzzy Cognitive Map and Bayesian Belief Network in Root Cause Analysis

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[1,3,4]Multimedia University, [2]University of Nottingham, China

Abstract

Background - *Root Cause Analysis (RCA) is a process to identify the root cause of a problem by exploring the cause-and-effect relationships among the variables. Most RCA frameworks share two major procedures which are causal modelling and causal reasoning. Fuzzy cognitive map (FCM) and Bayesian belief network (BBN) are widely implemented in RCA because of their respective strength. FCM is superior in modelling because of its simplicity and intuitiveness whereas BBN is superior in inferential because of its strong reasoning capability. However, FCM and BBN have weaknesses respectively.*

Purpose - *The weaknesses of FCM and BBN can be overcome by leveraging the mutual advantages of these two frameworks. The amalgamation of FCM and BBN is able to overcome the complexity of BBN in knowledge representation and modelling, and the limited inferential capability of FCM.*

Design/methodology/approach - *First, the components of the proposed causal framework are formally defined. The intuitiveness and simplicity of FCM in the modelling and representation are adopted in the proposed framework. Then, an inferential algorithm that inherits the strength of BBN in reasoning capability is proposed to supports all kinds of reasoning methods.*

Findings - *The proposed causal framework shows its advantages in modelling and representation, especially from the knowledge engineering perspective. Incrementally update in the model can be done easily because no reconstruction is needed when a component is added/removed. Moreover, the proposed causal framework has the capability to support different types of reasoning.*

Research limitations - *The proposed causal framework is limited to the knowledge engineering approach in which the causal model is constructed from the domain expert. Automatic learning from data is not the focus of this research. Furthermore, the proposed framework is not designed to handle the temporal aspect in the inference process as in the FCM.*

Originality/value - *Although FCM and BBN have been applied in RCA, they are normally applied individually. The proposed framework bridges the gap between FCM and BBN by providing a solution to overcome the mutual shortcomings of FCM and BBN.*

Keywords : root cause analysis, fuzzy cognitive map, Bayesian belief network.

Algorithmic Fairness for Customer Churn Prediction with Unbalanced Data Distribution

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Abstract

Background - *Customer churn prediction (CCP) is the process of forecasting the potential customers who are going to terminate the existing services. The class imbalance problem (CIP) is one of the major concerns in CCP task since it degrades the performance of the further learning process. One solution to solve CIP is to apply data sampling techniques (DST) before the training phase.*

Purpose - *In this paper, we provide an overview of the impact of using DST on the algorithmic bias/fairness of a CCP task. In addition, we inspect to what extent do the statistical bias should be permissible to contain in the dataset, the consequences of applying DSTs on algorithmic fairness, and compare the results before and after using them.*

Design/methodology/approach - *We experimented by using four significant DSTs namely, random over sampler, random under sampler, Synthetic Minority Oversampling Technique (SMOTE), and Adaptive Synthetic (ADASYN) applied on three versions of real-world telecom datasets with different unbalanced rates. Six popular classification techniques are utilized to predict the potential churners. Then, the classification performance and algorithmic fairness are measured with notable metrics and the AI fairness 360 tool. In addition, we also conducted comparisons on two other publicly available telecom datasets.*

Findings - *The results highlight the importance of the quality of the training data and the selection of statistical populations. It underlines the fact that certain groups in the dataset are still underrepresented even after data is sampled and would impact highly on the algorithmic bias. Furthermore, this paper provides the fact that why profit-oriented sectors including telecom should pay attention to algorithmic fairness in their widely-applied machine learning applications.*

Research limitations - *This study focuses only on group fairness rather than individual fairness. However, understanding the algorithmic fairness of different demographics groups is crucial for the customer-centric telecom sector and the indications could be easily applied across similar domains.*

Originality/value - *Algorithmic fairness is a broadly explored area these days, yet, there is a very little systematic study on the relationship between using of DSTs and algorithmic fairness. We believe this study would provide important insights on the overview of algorithmic fairness in CCP research.*

Keywords : Customer churn prediction, Algorithmic fairness, Data imbalance problem, Data sampling techniques

Track: Machine Learning

Modeling Sentiments and Opinions Based on Objectivity and Subjectivity with Self-Attention Mechanisms

hu ng[1], Glenn Jun Weng Chia[2], Timothy Tzen Vun Yap[3], Vik Tor Goh[4]

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Abstract

Background - *The proliferation of digital commerce has allowed many merchants to reach out to a wider customer base, prompting a study of customer reviews to gauge service and product quality through sentiment analysis. We believe that sentiment analysis can be enhanced through the subjectivity and objectivity classification with attention mechanisms, and this will allow merchants to quickly react to the reviews based on this analysis.*

Purpose - *This research includes input corpora of contrasting levels of subjectivity and objectivity from different databases to perform sentiment analysis on user reviews, incorporating attention mechanisms at the aspect level.*

Design/methodology/approach - *Two large corpora are selected as the objectivity and subjectivity datasets, the Wikipedia English dataset (Wikipedia) for objectivity and the Shopee user review dataset (Shopee) for subjectivity. Word embeddings are also created using Word2Vec with Skip-Gram. The model is then proposed, a bidirectional LSTM with an attention layer (Attention) imposed on word vectors. The performance of the model is evaluated and benchmarked against classification models of Logistics Regression and Linear-SVC. The three models are trained with the objectivity (Wikipedia) and subjectivity (70% of Shopee) embeddings, with 10-fold cross-validation. The models are then tested against two objectivity datasets (IMDB and 30% of Shopee). The experiments are based on benchmark comparisons, embedding comparison and model comparison with 70-10-20 train-test-validation splits. In addition, data augmentation using AUG-BERT is performed and selected models incorporating AUG-BERT, are compared.*

Findings - *The performance metrics were accuracy, precision, recall and F1-Score. Linear-SVC scored the highest accuracy with 56.9% for objective embeddings (Wikipedia) while the Attention model scored 69.0% on subjective embeddings (Shopee). Improved performances were observed with data augmentation using AUG-BERT, where the Attention+AUG-BERT model scored the highest accuracy at 60.0% for objective embeddings (Wikipedia) and 70.0% on subjective embeddings (Shopee), compared to 57% (objective) and 69% (subjective) for Linear-SVC+AUG-BERT, and 56% (objective) and 68% (subjective) for Linear-SVC.*

Research limitations - *This research does not consider the attention layers already available in models such as BERT, which can be extended through transfer learning.*

Originality/value - *The paper shows utilizing attention layers with subjectivity and objectivity notions can improve the accuracy of sentiment analysis models.*

Keywords : Sentiment analysis, subjectivity, objectivity, attention mechanism, neural nets.

Review of Accelerometer-based Road Monitoring Systems

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Abstract

Background - *Road condition monitoring has traditionally been carried out by specialist vehicles that have been outfitted with sensors such as lasers, radars, and infrared detectors. These systems are highly accurate but can be costly to purchase, operate, and maintain. As a result, alternative monitoring solutions such as those based on cameras, smartphones, and off-the-shelf IoT sensors have been proposed instead.*

Purpose - *In order to propose a robust road monitoring system, there needs to be a better understanding of the current state-of-the-art. In this paper, we carry out a thorough review of related work that specifically utilise accelerometer sensors. This sensor is versatile and can often be found in smartphones and IoT devices. We will analyse the various algorithms used to process the raw data from the accelerometer so that road conditions can be correctly identified and classified.*

Design/methodology/approach - *To this end, we study two main techniques used to classify the various road conditions (e.g. potholes, bumps, etc.) from accelerometer data, namely feature-based and threshold-based techniques. We study their algorithms to identify their features and determine the areas for improvements.*

Findings - *The threshold-based algorithm is straightforward to implement as no extensive calculations are involved but it is not fault-tolerant. On the other hand, feature-based techniques are more accurate in classifying the road conditions even though they are more complicated.*

Research limitations - *The accelerometer is cheap and reliable but lack granularity. This means that accelerometer cannot accurately determine the severity of the road condition (e.g. size of pothole, height of bumps, etc.). This could be mitigated by combining the accelerometer with other sensors such as an ultrasonic sensor, which is also cheap and robust.*

Originality/value - *Although the use of accelerometers to monitor road conditions is not novel, our research has determined that the results can be improved with the application of machine learning algorithms such as k-Nearest Neighbour (k-NN) or Random Forest (RF). Our future work will also use machine learning with an addition of a sensor calibration feature that will improve the accuracy of the road monitoring system.*

Keywords : Accelerometer, road condition monitoring, machine learning

The Effects of Temporal Variables in Customer Churn Service Type using Dynamic Bayesian Networks

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[1,2]Multimedia University, [3]Sunway University

Abstract

Background - *In the business world, customer churn has always been a problem that companies aim to reduce as it would cost the company more to obtain new customer when compared to retain an existing customer.*

Purpose - *There are several research work focusing on different algorithms for predicting customer churn, however, to the best of my knowledge, the relationship between customer churn and their temporal characteristics is not yet been explored.*

Design/methodology/approach - *In this work, Dynamic Bayesian Networks (DBN) will be used to incorporate temporal information into customer churn. With DBN, we will be able to further control the model by changing the Conditional Probability Table (CPT) to improve the model's performance further. Bayesian Networks (BN) will be used as a benchmark to compare with DBN to compare how temporal variables affect the model performance. Due to the fact that the accuracy metric will be easily influenced by the CPT values, which suggests that F1-Score will be a better metric to evaluate the models.*

Findings - *The preliminary finding suggests that DBN did have a higher average F1-Score of 0.6431 than BN with an average F1-Score of 0.352.*

Research limitations - *Due to time constraint, this research work does not take into consideration of different clustering method. Futhermore, more experiment could be done by using smaller number per iteration.*

Originality/value - *This research work has shown that temporal characteristics does indeed have a correlation to customer churn as F1-Score of DBN is 0.2911 higher than BN.*

Keywords : Churn Analytics, Bayesian Networks, Dynamic Bayesian Networks, Prediction

Comparison of Different Clustering Methods on the Effects of Customer Churn

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Abstract

Background - *Customer churn has always been an issue for any company of any industry that provides services or trade products. There is multiple research work focusing on predicting customer churn. However, the relationship between the method of clustering and customer churn has not been fully explored.*

Purpose - *In this study, it has been hypothesized that by using clustering method that takes into account of geospatial information like Hierarchical Density-Based Spatial Clustering of Applications with Noise (HDBSCAN) algorithm will have better results as compared to partitioning clustering method like KMeans algorithm.*

Design/methodology/approach - *Empirical study has been conducted to employ Bayesian Networks (BN) to investigate how different clustering methods affect the prediction of customer churn.*

Findings - *The preliminary results on the models suggested that the clustering method that takes into account of geospatial information do assert a positive effect when compared to clustering method that uses partitioning clustering method with the accuracy of 62.80%, 61.67%, 61.17%, 62.43% and 52.31% with an average of 60.08% for HDBSCAN whereas 46.06%, 54.59% and 47.62% with an average of 49.43% for KMeans.*

Research limitations - *This research work only take into consideration of two clustering methods due to time constraint. Furthermore, different machine learning algorithm can be employed to have more robust prediction.*

Originality/value - *Based on the findings of this research work, it has shown that clustering method that takes into consideration of geospatial information does indeed improve the accuracy of predicting the customer churn service type as compared to partitioning clustering method.*

Keywords : Churn Analytics, Bayesian Networks, Cluster Analysis, Prediction

A Visual Approach Towards Forward Collision Warning for Autonomous Vehicles on Malaysian Public Roads

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[1,2,3]Multimedia University

Abstract

Background - *Today, and possibly for a long time to come, autonomous vehicles are the key to smart transportation. Autonomous vehicles will be progressively adopted on public roads to improve traffic safety. Although appealing advancements have been made, there are a number of challenges associated with the development of autonomous vehicles, among which is the reliability of a collision avoidance mechanism in practical applications. Collision detection and avoidance are critical decision making components in autonomous driving as they are centrals to driver's safety.*

Purpose - *This study presents a robust approach for forward collision warning using vision data for autonomous vehicles on Malaysian public roads.*

Design/methodology/approach - *An integrated deep learning-based object classification and patch-based lane detection approach is proposed to perceive the environment around the vehicle. Object classification is the most fundamental but challenging problem to help autonomous vehicles track and classify surrounding objects like cars, motorcycles and pedestrians correctly. Lane detection, on the other hand, defines a safe region for the vehicle to manoeuvre. By integrating the deep learning-based object classification algorithm and patch-based lane detection algorithm, the proposed system allows autonomous vehicles to account for obstacles when considering possible future trajectories on the road.*

Findings - *Experimental results validate the effectiveness of the proposed forward collision avoidance approach under different environmental conditions on Malaysian public roads, including shadows and curves.*

Research limitations - *This study was performed using the main public road types in Malaysia, i.e. highways and federal roads. Other road types containing different sizes and road surface markings will be the future endeaver of this work.*

Originality/value - *The originality of this study stems from the proposed integrated deep learning-based object classification algorithm and patch-based lane detection algorithm that can handle the changes in appearance, illumination and environmental variations.*

Keywords : Object recognition, Lane detection, Autonomous vehicles, Computer Vision

Predictive Modelling of Student Performance Based on Machine Learning Approach

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[1,2,3,4]Multimedia University

Abstract

Background - *Many factors affect student performance such as the individual's background, habits, absenteeism and social activities. Using these factors, corrective actions can be determined to improve their performance. This study looks into the effects of these factors in predicting student performance from a data mining approach.*

Purpose - *This study presents a data mining approach in identifying significant factors and predict student performance, based on two datasets collected from two secondary schools in Portugal.*

Design/methodology/approach - *Two datasets on of factors affecting student performance collected from two secondary schools in Portugal are considered in this study. Firstly, the data used in the study is augmented to increase the sample size by merging the two datasets. Following that, data pre-processing is performed and the features are normalized with linear scaling to avoid bias on heavy weighted attributes. Next, Boruta feature selection is performed to remove irrelevant features. The selected features are then assigned into four groups comprising of student background, lifestyle, coursework and all features. Finally, the classification models of Support Vector Machine (SVM), Naive Bayes (NB), and Multilayer Perceptron (MLP) origins are designed and their performances evaluated and compared against other approaches.*

Findings - *The models were trained and evaluated on an integrated dataset comprising 1044 student records with 34 features, after feature selection. The classification was performed with SVM, NB and MLP with 60-40 and 50-50 train-test splits and 10-fold cross validation. GridSearchCV was applied to perform hyperparameter tuning. The performance metrics were accuracy, precision, recall and F1-Score. SVM obtained the highest accuracy with scores of 77%, 80%, 91% and 90% on background, lifestyle, coursework and all features respectively in 50-50 train-test splits for binary classification (pass or fail). SVM also obtained highest accuracy for five class classification (grade A, B, C, D and F) with 38%, 39%, 73% and 71% for the four categories respectively.*

Research limitations - *The study looks at data only from Portugal and may not reflect a general view of the case.*

Originality/value - *The paper presented predictive modelling of student performance based on four categories. Based on the results, coursework shows significant contribution to good student performance.*

Keywords : student performance, data mining, support vector machine, naive bayes, multilayer perceptron.

Neural Matrix Factorization++ based Recommendation System

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Abstract

Background - *Recommendation System (RS) research work has covered a wide variety of Artificial Intelligence techniques, ranging from traditional Matrix Factorization (MF) to complex Deep Neural Networks (DNN). Traditional Collaborative Filtering (CF) recommendation methods such as MF, have limited learning capabilities as it only considers the linear combination between user and item latent vectors. For learning non-linear relationships, methods like Neural Collaborative Filtering (NCF) incorporate DNN into CF methods. Though, CF methods may still suffer from data sparsity and cold start problems.*

Purpose - *In this paper, we propose an improved hybrid-based RS namely Neural Matrix Factorization++ (NeuMF++) for effectively learning the user and item features to improve the performance and accuracy of the result.*

Design/methodology/approach - *NeuMF++ is proposed by incorporating effective latent representation into NeuMF. NeuMF is a NCF framework which associates with GMF (Generalized Matrix Factorization) and MLP (Multilayer Perceptrons). Effective latent representation can be obtained through the latent space of Stacked Denoising Autoencoders (SDAEs). NeuMF++ can be seen as the fusion of GMF++ and MLP++.*

Findings - *Incorporating effective latent representations allows NeuMF to effectively learn user and item features which will greatly enhance its learning capacities. Concurrently, sharing feature extractions among GMF and MLP in NeuMF++ might limit its performance. Hence, allowing GMF and MLP to learn separate features and combine them in their last layer, not only provide more flexibility, but also greatly improve its performance. Extensive experimental results on the real-world dataset have demonstrated the effectiveness of latent representations learned by our model. Our NeuMF++ achieves an outstanding result of a root-mean-square error of 0.855.*

Research limitations - *NeuMF++ is not limited to auxiliary information. It can be extended with other information such as item descriptions, reviews information or even images. Different neural network building blocks can be integrated into NeuMF++ to form a more powerful recommendation model.*

Originality/value - *Incorporating latent representation through SDAEs has shown tremendous improvement in GMF and MLP, which result in GMF++ and MLP++. NeuMF achieves state-of-the-art results due to the integration of GMF linearity and MLP non-linearity. Hence, incorporating latent representation by integrating GMF++ and MLP++ would result in a new hybrid model known as NeuMF++.*

Keywords : Recommendation System, Matrix Factorization, Collaborative Filtering, Deep Neural Networks, Neural Collaborative Filtering.

Customer Churn Prediction for Telecommunication Industry: A Malaysian Case Study

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Abstract

Background - *Sustaining long-term relationships with customers by monitoring their behaviour is more effective than pursuing new customers. According to previous research, a 5% increase in customer satisfaction results in a 95% increase in sales. The more businesses understand their customers behaviour, the more revenue they will anticipate in the future. Although businesses are aware of this fact, they are still struggling in identifying the causes of the customer churn.*

Purpose - *This study aims to identify the factors behind customer churn while also presenting a telecommunications services framework to the industry.*

Design/methodology/approach - *This study employs data mining techniques on a Malaysian telecommunications company data in the period of September 2019 and September 2020. A total of 7776 records with 30 fields were analysed to identify significant variables for the churn prediction model. Correlations between the variables were also considered. Out of 38 variables, 25 variables including including promoter, passive, and distractor were used to generate the propensity for customers to churn using Logistic Regression (LR), Linear Discriminant Analysis (LDA), K-Nearest Neighbours Classifier (KNN), Classification and Regression Trees (CART), Gaussian Naive Bayes (NB) and Support Vector Machine (SVM).*

Findings - *The findings show that customers with a lower NPS score are more likely to churn than customers with a higher NPS score rating. Furthermore, an immediate helpdesk response can ensure that customer needs are met and act as a mediator in determining an employee's ability to satisfy customers. The results show that CART has the highest accuracy rates (98%) for predicting potential customer churn. Some churn determinants influence customer churn, either directly or indirectly through a change in NPS feedback rating, or both a rating change explains the relationship between churn determinants.*

Research limitations - *The scope of the study is limited to two benchmark datasets from the Malaysian Telecommunication company. This study was unable to get personal customer information due to the customer data protection policy. These limitations may impact the generalisation of this study.*

Originality/value - *This research will help the company reduce potential churners by improving customer service. The company can retain more loyal customers and increase profits by implementing those enhancements.*

Keywords : Customer Churn, Net Promoter Score (NPS), Data Mining Techniques

Non-Invasive Health Prediction from Visually Observable Features

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[1,2]Multimedia University

Abstract

Background - *The unprecedented development of Artificial Intelligence has revolutionised the healthcare industry. In the next generation of healthcare systems, self-diagnosis will be pivotal to personalised healthcare services. During the COVID-19 pandemic, new screening and diagnostic approaches like mobile health are well-positioned to reduce disease spread and overcome geographical barriers.*

Purpose - *This paper presents a non-invasive screening approach to predict the health of a person from visually observable features using machine learning techniques. Images like face and skin surface of the patients are acquired using camera or mobile devices and analysed to derive clinical reasoning and prediction of the person's health.*

Design/methodology/approach - *In specific, a hierarchical classification approach is presented. The proposed hierarchical model chooses a class by training a binary classifier at the node of the hierarchy. Prediction is then made using a set of class-specific reduced feature set. Furthermore, an explainable component is incorporated in the machine learning model to interpret how a decision is derived.*

Findings - *Empirical results demonstrate that the proposed approach yields favourable prediction results while greatly reduces the computational time. The explainable component provides a visualisation of the model that further improves understanding about the decision making process.*

Research limitations - *The work only considers visually observable features like rashes, sores and tones of the face and skin surface for common disease prediction. More in-depth study of other complicated diseases will be the future venture of this study.*

Originality/value - *Grounded on the concept of interpretable AI, the proposed approach offers a promising complement to traditional medicine through the provision of at-home screening and diagnosis.*

Keywords : Machine learning, Health prediction, Explainable AI, Remote screening and diagnosis

Facial Expression Recognition using In-the-Wild Datasets with Improved Performance Metrics

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Abstract

Background - *Facial Expression Recognition is a challenging field, which is evident by the ineffectiveness of current state-of-the-art techniques that aim to classify facial expressions. Despite showing high levels of accuracy, these methods perform poorly in practice and in real-life implementation. This is because the training sets used are usually simple, limited, and in a controlled lab environment.*

Purpose - *This research explores newer datasets that consist of images taken in challenging conditions, with large variations. This is to improve the accuracy of classification. In addition, newer performance metrics are used to reflect the challenging conditions for classification.*

Design/methodology/approach - *A review is made of the current best techniques for expression recognition and a method is laid out to design an improved deep neural network using AffectNet with a more challenging dataset. The implementation method is an iterative process that trains Convolutional Neural Network on challenging datasets, evaluates the result, and then improves the model by tuning parameters. The models are also evaluated with new metrics like cross-dataset accuracy and mean accuracy drop.*

Findings - *The best performing model was found to be the Visual Geometry Group 16 layer model, with a training accuracy of 81.05% and a testing accuracy of 70.69%, an improvement of 6.69% compared to AlexNet, the next best model trained on the same data set. The proposed model was also assessed with cross-dataset accuracy, outperforming Inception V3, the next best model on the same metric.*

Research limitations - *The research was done using 27,000 images of AffectNet, due to hardware limitations. This can be explored further using larger image datasets. In addition, it was carried out using still images. A video in-the-wild dataset would be great to explore.*

Originality/value - *Improved accuracy due to a better, more challenging dataset and model robustness due to the usage of new metrics were achieved.*

Keywords : Deep Learning, Affect Classification, In-The-Wild Facial Expression Recognition, Cross-Dataset Accuracy

Comparison of the Performance of Sentiment Classifiers on Tweets of Clothing Brands

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[1,2,3,4]Multimedia University

Abstract

Background - *Social media such as Facebook, Instagram, LinkedIn and Twitter ease the sharing of ideas, thoughts, videos, and photos and information through the building of virtual networks and communities. This has allowed companies and products to reach a wider audience in terms of marketing and advertising, and to gauge feedback from the public. This study looks at how well sentiment classifiers work on brand mentions in social media through social engagements such as product feedback, reviews etc., in particular clothing brands.*

Purpose - *This research looks into clothing brand mentions on Twitter to perform sentiment analysis on users' thoughts on clothing brands, namely Asos, Uniqlo and Topshop.*

Design/methodology/approach - *Firstly, the data is collected by applying python libraries, Tweepy to access data from Twitter streaming API. Following that, data pre-processing such as tokenization, filtering, stemming and case normalization are performed to remove outliers. Padding is applied to ensure each sentence has the same length and not be biased. Then, the TextBlob algorithm is applied to label the tweet data into three classes; Positive, Negative and Neutral based on the polarity of the tweets. Word embeddings are also created using Word2Vec with TF-IDF. The word embeddings are fed into classification models namely Support Vector Machine (SVM), NaIve Bayes (NB), Random Forest (RF), Logistic Regression (LR) and Multilayer Perceptron (MLP) and with their performances compared and evaluated.*

Findings - *The models were trained and evaluated from a curated tweet dataset comprising 24000 records with three clothing brands (Asos, Uniqlo, Topshop). The classification was performed with SVM, NB, RF, LR and MLP with 50-50 and 70-30 train-test splits. GridSearchCV was applied to perform hyperparameter tuning. The performance metrics were accuracy, precision, recall and F1-Score. LR obtained the highest accuracy with scores of 82%, 87% and 87% on Asos, Uniqlo and Topshop respectively in 50-50 train-test splits. LR also obtained highest accuracy with scores of 85%, 90% and 90% for the three clothing brands respectively in 70-30 train-test splits.*

Research limitations - *The study looks at only 20000 tweets of three clothing brands.*

Originality/value - *The paper compared the performance of sentiment classifiers on tweets of three clothing brands.*

Keywords : Sentiment analysis, classification, machine learning, clothing brand

Significant Page Elements for E-Commerce Websites through a Data Mining Approach

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[1,2,3,4]Multimedia University

Abstract

Background - *Good e-commerce website with optimal design features is needed for an e-commerce to stay on top of the game. To retain customer attention and prolong the visit to the site, e-commerce websites should be designed with design elements that sustain this. This study looks at the design elements that are significant for this motivation through a data mining approach.*

Purpose - *This study looks into optimal page elements for an e-commerce platform with the intention of grabbing the shopper's attention.*

Design/methodology/approach - *This study makes use of the Online Shopper's Intention dataset, a dataset of shopping sessions on e-commerce platforms with features such as Bounce Rate, Exit Rate, Page Value Informational Duration, etc. Data pre-processing is first performed and the features are normalized with linear scaling to avoid bias on heavy weighted attributes. Next, Boruta feature selection is performed to remove irrelevant features, where any feature below the threshold of 0.2 is dropped. Finally, the classification models of Support Vector Machine (SVM), Random Forest (RF), Logistic Regression (LR) and Multilayer Perceptron (MLP) origins are designed and their performances evaluated.*

Findings - *The models were trained and evaluated on an integrated dataset comprising 12,000 online shopper records with 18 features after feature selection. The classification was performed with SVM, RF, LR and MLP with 80-20, 67-33 and 50-50 train-test splits. GridSearchCV was applied to perform hyperparameter tuning. The performance metrics were accuracy, precision, recall and F1-Score. RF obtained the highest accuracy with scores of 90.4%, 90.2% and 89.9% in 80-20, 67-33 and 50-50 train-test splits.*

Research limitations - *The study looks at a single dataset (Online Shopper's Intention) only and may not reflect a general view of the case.*

Originality/value - *The paper presented a classification of features from the Online Shopper's Intention dataset to obtain optimal page design elements that shows the longest visit retention on the platform. Based on the results, RF obtained the highest score significantly among the four classifiers in three experiment designs.*

Keywords : Website design, e-commerce, data mining, feature selection

Evaluation of Electrocardiogram Numerical vs Image Data for Emotion Recognition System

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Abstract

Background - *Electrocardiogram (ECG) is one of the physiological signals used in diagnosing and monitoring cardiovascular disease. This is frequently done using analysis of ECG wave images. On the other hand, many studies had proven that human emotions could be identified using ECG. The identification is usually done using numerical data. However, the standard ECG is often recorded in the format of a wave image rather than the numerical information. The identification of human emotion using ECG images is still lack in the studies.*

Purpose - *There is still no consensus whether the ECG input format, either as image or numerical value, affects an emotional classification accuracy in the emotion recognition system (ERS). Therefore, this study investigates the effect of the ECG input format on the ERS by comparing the performance of emotion classification using ECG image and ECG numerical data.*

Design/methodology/approach - *This study used the DREAMER dataset, which contains 23 recorded numerical data of ECG during emotional elicitation using audio-visual stimulation. These numerical data are converted to ECG images for comparison. The ECG features are extracted using several methods. The features from numerical data are extracted using Augsburg BioSignal Toolbox (AUBT) and Toolbox for Emotional feature extraction from Physiological signals (TEAP), while KAZE, and Scale Invariant Feature Transform (SIFT) are used to extract the features from image data. The features dimension is reduced using Linear Discriminant Analysis and the valence and arousal are classified using the Support Vector Machine (SVM).*

Findings - *The experimental results show that the accuracy of arousal and valence achieved by the numerical data is higher than the image data with 69% and 79%, respectively. For ECG images, the highest accuracy for arousal is 58%; meanwhile, for valence is 63%. This finding shows, numerical data provides better accuracy for ERS, but ECG image data is also showing positive potentials and can be considered as an input modality for ERS.*

Research limitations - *The lower accuracy for the image dataset may be related to the size of the data, which is considered small for image learning and classification. In the future, with a larger size of data, deep learning techniques can be considered for emotion classification using ECG images as a primary modality.*

Originality/value - *Although classification based on ECG images is frequently used for heart condition analysis, lack of work had been reported on the usage of ECG images for ERS. This study explores this aspect and the findings show a promising research direction in the development of ECG based ERS.*

Keywords : Emotion recognition, electrocardiogram, numerical ECG, image ECG, DREAMER

Optimised Neural Network Regression Model for Predicting Asthma Exacerbation Based on Personalised Weather Triggers

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Abstract

Background - *Recently, there have been attempts to develop asthma self-management applications. However, there is a lack of applications that can predict asthma exacerbation based on personalised weather triggers and provide tailored feedback.*

Purpose - *This paper proposes an optimised neural network regression model for predicting asthma exacerbation based on weather triggers and demographic characteristics to enhance asthma self-management.*

Design/methodology/approach - *With the aim to integrate among weather, demography, and asthma, an mHealth application was developed where users conduct the Asthma Control Test (ACT). The ACT is a self-administered survey that identifies the chances of asthma exacerbation for individual users. The dataset consists of panel data from 10 asthmatic patients that included 530 ACT scores as the output variables. The Boruta algorithm was used to identify the significant input features, which contain five demography features (age, gender, outdoor-job, outdoor-activities, location) and five weather features (temperature, humidity, air-pressure, UV-index, wind-speed). Subsequently, two neural network regression models were applied: Multiple Linear Regression (MLR) and Deep Neural Network Regression (DNNR).*

Findings - *The results show that DNNR provides higher accuracy (87%) than MLR (57%). As such, the dataset is nonlinear, consisting of multi-layer features that required deep modelling. To obtain optimum prediction results, the parameters of the DNNR model were adjusted to ensure that the Mean Absolute Error (MAE) and the Mean Squad Error (MSE) are in the acceptable loss range (error <0.5). Consequently, the optimised DNNR model (with 4 hidden layers and 30 neurons at each hidden layer) achieved a 97% accuracy with MAE =0.35 and MSE =0.37.*

Research limitations - *The data was collected from a limited number of users and in one climate region. More users from different climate regions need to be considered for testing the generalisation capability of the proposed model.*

Originality/value - *This study is the first of its kind that recognises the DNNR potentials to identify the correlation patterns among asthma, weather, and demographic variables. The optimised model can be adopted to develop mHealth applications that can predict disease exacerbations based on personalised weather triggers.*

Keywords : Machine learning, neural network, personalisation, asthma self-management

Particulate Matter (PM2.5) Concentration in Smart Cities using Machine Learning Algorithms: A Review

Kuhaneswaran[1], Su-Cheng Haw[2], Rishanti[3], S Subramanian[4]

[1,2,3,4]Multimedia University, [5]Annamalai University

Abstract

Background - *Particulate Matter (PM), an air pollutant that is detrimental to breathe in, is either emitted or formed ambient. Exposure to PM2.5, fine particles of 2.5 micrometers diameter, when inhaled causes nonfatal heart attacks, adverse birth outcomes, etc. Hence, to develop pollution control strategies requires the prediction of PM2.5 concentrations. Increasingly, machine learning (ML) algorithms are used for highly accurate prediction of air pollutant concentrations such as CO, O3, PM10, NO2, CH4.*

Purpose - *Recently, air quality in Smart Cities of Malaysia faces a serious problem due to industrialization, emissions from private motor vehicles, and transboundary haze pollution. Therefore, the forecasting of PM2.5 emissions to ensure its level within the statutory limits becomes necessary. Various ML methods have been used in existing research to predict the air pollution concentrations in comparison to PM2.5. This study focused on investigating the ML techniques for the prediction of PM2.5.*

Design/methodology/approach - *In this study, we establish the definition of air pollution, PM and PM2.5, sources of PM2.5 and its impacts. We discussed the published air quality (PM2.5) assessments within 5 years in Google Scholar and air pollution research databases, covering Malaysian and International context. We examined and compared the published findings based on supervised ML approaches such as deep learning, decision trees, and so on. Finally, we look comprehensively on the performance evaluation of the ML models.*

Findings - *In Malaysia, very few studies have used ML techniques to predict air quality when compared with global studies. Recently, the subject of research has shifted to PM2.5 prediction using ML techniques but in Malaysia, the focus is still on predicting other pollutants. Random Forest, Artificial Neural Network, Long Short – Term Memory were the widely used ML approaches for predicting PM2.5.*

Research limitations - *In this paper, supervised ML techniques were only considered to predict PM2.5. The relationship between PM2.5 and other pollutants were not considered.*

Originality/value - *The knowledge of widely used supervised ML algorithms in recent studies for predicting PM2.5. The supervised ML techniques to be considered for the accurate prediction on larger datasets in real-time, which signals to prepare plans for preventing adverse effects.*

Keywords : Air Pollution, Particulate Matter (PM2.5), Prediction, Machine Learning

Predicting Particulate Matter (PM2.5) using Machine Learning Methods

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Abstract

Background - *Air pollution in smart cities around the world has been steadily increasing in recent years. An increase in the concentration of particulate matter, PM2.5 is a threat, as it can out-turn unbearable consequences such as cardiovascular disease and worsening asthma. Air Pollutant Index (API) is used as the indicator to measure air quality. Existing research has used various supervised machine learning (ML) techniques for predicting the concentration of air pollutants compared to PM2.5. In Malaysia, ML techniques for PM2.5 have received less attention as the concentration is on predicting other air pollutants.*

Purpose - *To fill the research gap, this study focuses on accurately predicting the concentration of PM2.5 in the smart cities of Malaysia by comparing supervised ML techniques, which helps to mitigate its adverse effects.*

Design/methodology/approach - *In this paper, ML models for forecasting PM2.5 concentrations are investigated on Malaysian Air Quality data sets from 2017 to 2019. The dataset is preprocessed by data cleaning and normalization process for further analysis. Next, it is reduced into an informative dataset with demographical and meteorological factors in the feature extraction process. The dataset is fed into three Supervised ML classifiers, which includes Artificial Neural Network (ANN), Long Short-Term Memory (LSTM) and Random Forest (RF). Finally, their output will be evaluated using confusion matrix and compared to identify the best model for accurate prediction of PM2.5.*

Findings - *Overall, the experimental result shows the accuracy of 98% is obtained by the LSTM model in comparison to the accuracy of RF (97%) and ANN (95%) in predicting PM2.5. Thus, the LSTM is superior because of its feedback connections between data sequences. Also, LSTM requires lesser computation time for larger datasets which alerts the air quality management in real-time to develop emission reduction strategies.*

Research limitations - *In this paper, to predict PM2.5 only supervised ML techniques were considered for comparison. The relationship between PM2.5 and other pollutants were not considered.*

Originality/value - *For PM2.5 prediction, previous research has used various supervised ML techniques. However, comparative analysis of them is often required for the identification of the best model for accurately predicting the concentration of PM2.5.*

Keywords : Air Pollution, Particulate Matter (PM2.5), Artificial Neural Network, Long Short-Term Memory, Random Forest

Extremist Content Detection on Social Media: A Hybrid Machine Learning Approach

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Abstract

Background - *Extremism becomes a familiar issue all over the world. Extremism-related content can be seen widely in social media sites, such as Facebook, Twitter, etc. Therefore, it is important to analyze these social media contents to detect extremism. Different machine learning algorithms have been applied in existing research to address this issue by applying base learning algorithm but there is less accuracy in terms of classifying the data more accurately.*

Purpose - *To overcome the research gap, our research aims to focus on a sentimental analysis of social media textual data by implementing hybrid machine learning algorithm.*

Design/methodology/approach - *Initially, exploratory data analysis is performed on the social media data; the data was extracted from three popular Facebook news pages: Alzazeera news, B.B.C news, and C.N.N news, from 2019-2020. Then, the data is pre-processed for further analysis. Next, the textual data is classified into different labels using a lexicon-based approach. Afterwards for the classification, we choose two skilful machine learning algorithms, linear Support Vector Classifier (linearSVC) and Random Forest (RF) classifier and we combined them as a hybrid model(linearSVC+RF), which has the potential to capture the benefits of both classifiers. Finally, the proposed model is evaluated by analyzing the evaluation metrics and validated on the unseen data to examine the model performance.*

Findings - *Overall, the experimental result shows the accuracy of 89% is obtained by the proposed model (linearSVC+RF) in comparison to the base classifier linearSVC accuracy (77%) and RF (80%). Thus, the proposed model is superior in classifying the data more accurately. We get a very meaningful insight of data showing the presence of extremism trend in the content. These research findings can be utilized as an alert to detect online extremist activities in social media.*

Research limitations - *Only contents written in the English language are considered in this research. This work can be extended to analyze the textual contents of multiple languages.*

Originality/value - *Previously, many approaches have been developed to identify the extremism contents in social media applying conventional machine learning algorithms. However, their accuracies are limited. In this work, an efficient hybrid model is developed with improved accuracies.*

Keywords : Extremism, Sentiment Analysis, Lexicon, Linear Support Vector, Random Forest

Categorising of FYP Projects using LDA Modelling and K-Means Clustering

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Abstract

Background - *Every year there will be a new batch of students in FCI MMU taking the Final Year Project (FYP) subject. Many FYP projects would be proposed by lecturers and students, which are uploaded in the FCI FYP system database. Since the project is only simply categorised by major like Software Engineering, Information Systems, Data Science, and Games Development, it will be hard for the students to find their desired project in the database in a short period of time.*

Purpose - *This research aims to find a way to categorize the FYP projects into categories to ease the students' search efforts. As the project details are written in text form, the text mining method was used to find the patterns to categorise the projects.*

Design/methodology/approach - *It is an unsupervised task to categorize the project because there is no predefined category for each project. The machine learning models used are Latent Dirichlet Allocation (LDA) for Topic Modelling and K-means clustering for text clustering. A dataset of FYP projects from past years was used to identify the distribution of words in each category, and LDA method was used to find the topic base on the distribution of word in a project while K-means clustering would identify the project clusters. The results are then evaluated to map the categories of a particular topic or cluster.*

Findings - *The processing of the training dataset with LDA algorithms identified that 10 topics have the best coherence value of 0.4451. K-Means clustering is then performed on the dataset to identify 10 clusters and the top keywords associated with each cluster using LDA models. Testing with the test dataset produced 73% accuracy in labelling the projects with the suitable topics.*

Research limitations - *The major limitations of LDA models are lack of correlation between topics and the static nature of the models. Further study could be done on the topics relatedness and improving the models when more projects are added to the dataset.*

Originality/value - *The use of unsupervised learning to dynamically identify topics related to FYP projects using LDA models and K-Means clustering.*

Keywords : Topic Modelling, Text Clustering, Latent Dirichlet Allocation (LDA), K-means Clustering, Unsupervised task

Improving the Prediction of Crop Yield with a Stacked Generalization Ensemble Method

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Abstract

Background - *In recent days' digitization is gaining importance towards the different domain of knowledge such as agriculture, medicine, personalization systems, recommendation platforms, Internet of Things (IoT) and weather forecasting. Among the above, Agriculture is the domain which plays an important role in the improving countries economy. Although farmers are skilled in the cultivation of crops, there lies a huge gap between scientific and technological knowledge available to them in rural areas. In this context, Crop yield estimation is essential for improving the productivity and decision-making processes such as, financial market forecasting and addressing food security issues.*

Purpose - *The main objective of the article is to predict and improve the accuracy of the crop yield using hybrid Machine Learning (ML) algorithms.*

Design/methodology/approach - *The proposed work focuses on data preprocessing techniques such as missing value estimation and revamping of outliers to improve the accuracy of the proposed algorithms. This article proposes improved ML algorithms that use specialized ensembling methods such as stacked generalization, gradient boosting, random forest and lasso regression. Stacked generalization is a new model which learns how to best combine the predictions from two or more models trained on the dataset. The performance of the algorithms is compared using cross-validation to identify the most promising performers for the dataset.*

Findings - *For demonstrating the use of the proposed algorithm two different datasets: aerial intel and Agricultural datasets from Kaggle are used. Empirical results on datasets showed that the proposed stacked generalisation ML algorithm statistically outperforms, with an accuracy of 88.89%.*

Research limitations - *In future, the work can be extended further by applying deep learning algorithms and other hybrid Machine Learning algorithms to improve the accuracy.*

Originality/value - *Based on the experimental results done on the agricultural data, the following observations were made. The accuracy of Random forest regressor, gradient boosted tree regression and stacked generalization ensemble methods are 87.71%, 86.98% and 88.89 % respectively. The proposed stacked generalisation ML algorithm statistically outperforms with an accuracy of 88.89% and hence demonstrates that the proposed approach is an effective algorithm for predicting the crop yield.*

Keywords : Machine Learning, Prediction, Crop Stacked, Generalization, Random Forest

Track: Blockchain

Exploratory Graph Analysis of the Transactions on the Bitcoin Network

Timothy Tzen Vun Yap[1], Justin Kai Ming Ngu [2], Hu Ng[3], Vik Tor Goh[4]

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Abstract

Background - *This research looks into the exploratory analysis of the transaction data of the Bitcoin network, through a graph analysis approach. This is achieved through network visualization and mathematical and statistical modelling of the network data.*

Purpose - *The purpose of the research is to provide a targeted analysis of the Bitcoin network, capturing the interconnectedness of the system with its notion of elements, in this case, the transactions on the network.*

Design/methodology/approach - *The dataset in this study is extracted from the Bitcoin in BigQuery public dataset, specifically selected transactions in July 2019. The transactions are firstly modelled as network graphs and then visualized using the Kamada-Kawai and force-directed graphs layouts. Further modelling is explored with classical random graph and network block, with emphasis on network cohesion, hierarchical clustering and community membership.*

Findings - *Looking at the network visualization, the depiction of nodes and arrows indicate the senders and the receivers. Certain nodes are with arrows pointing to itself, a result of the unspent transaction outputs (UTXO) mechanism employed in Bitcoin. The network also shows a total of 417 clusters, the largest cluster having 389 members and one member for the smallest clusters. With fixed degree sequence mathematical modelling (random graph fixed sized), the expected number of clusters is expected to be 366 clusters, however the model shows an optimal 363 clusters. In terms of statistical modelling, the network block model suggests only 3 clusters, which does not reflect the actual 417 clusters. Both models fall short of the expected 417 clusters, indicating that both models are not able to capture additional mechanism that may be present at the density and social interaction distribution level of the network. The network block modelling shows only three major clusters, an indication that the model is not able to capture the network sufficiently, making it unsuitable for representing the network.*

Research limitations - *The study takes into account the selected transactions in July 2019 only, which may not be generally representative of the entire Bitcoin network.*

Originality/value - *Network visualization of the transaction data of the Bitcoin network, with emphasis on random graph and network block modelling.*

Keywords : Bitcoin, graph analysis, blockchain, network modelling

Exploratory Graph Analysis of the Transactions on the Ethereum Network

Timothy Tzen Vun Yap[1], Ting Fong Ho[2], Hu Ng[3], Vik Tor Goh[4]

[1,2,3,4]Multimedia University

Abstract

Background - *This research looks into the exploratory analysis of the transaction data of the Ethereum network, through a graph analysis approach. This is achieved through network visualization and mathematical and statistical modelling of the network data.*

Purpose - *The purpose of the research is to provide a targeted analysis of the Ethereum network, capturing the interconnectedness of the system with its notion of elements, in this case, the transactions on the network.*

Design/methodology/approach - *The dataset in this study is extracted from the Ethereum in BigQuery public dataset, specifically selected transactions in July 2019. The transactions are firstly modelled as network graphs and then visualized using the Kamada-Kawai and force-directed graphs layouts. Further modelling is explored with classical random graph and network block, with emphasis on network cohesion, hierarchical clustering and community membership.*

Findings - *Looking at the network visualization and hierarchical clustering of the data, the network shows 170 clusters, the largest having 135 members. Through random graph modelling the optimum number of clusters is shown to be 95. Referring to the generated dendrograms, notable large transactions center around the DRINK token, the Maximine Exchange, the Upbit2 Exchange and the IDEX Exchange, identified through public disclosure of their Ethereum addresses. The network graphs tend to go towards the DRINK smart contract and the Maximine Exchange, indicating deposit actions, while it is the opposite for the IDEX Exchange. Further analysis also shows a different number of communities than the expected number. Falling short of the expected 170 clusters, the model is not able to capture additional mechanism that may be present at the density and social interaction distribution level of the network. On the other hand, network block modelling shows only four major clusters out of the 170 expected clusters, an indication that the model is not able to capture the network sufficiently.*

Research limitations - *The study takes into account only selected transactions in July 2019, which may not be generally representative of the Ethereum network. This will be addressed in future work.*

Originality/value - *Network visualization of the transaction data of the Ethereum network, with emphasis on random graph and network block modelling.*

Keywords : Ethereum, graph analysis, blockchain, network modelling

A Blockchain-based Data Access Control for Healthcare

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Abstract

Background - *Unauthorized access to data is one of the most significant privacy issues that hinder most industries from adopting big data technologies. Despite the fact that certain processes and structures have been put in place to deal with access authorization and identity management for huge databases, nevertheless, the scalability criteria of big data are well beyond the capabilities of traditional databases. Therefore, it is trivial to set-up a scalable and efficient identity management algorithm for conventional databases.*

Purpose - *This study presents the strengths and weaknesses of implementing cryptography and blockchain for identity management and authorization control in big data, focusing on the healthcare domain.*

Design/methodology/approach - *Firstly, we proposed a decentralized data access and sharing system that preserves privacy to ensure adequate data access management under the blockchain. Secondly, we designed a blockchain framework to resolve the decentralized data access and sharing system privacy issues, by implementing a public key infrastructure model, which utilizes a signature cryptography algorithm (elliptic curve and signcryption). Lastly, we evaluated the performance of the proposed blockchain model as compared to existing approaches.*

Findings - *We evaluated the blockchain on four performance metrics which include throughput, latency, scalability, and security. The proposed blockchain model was tested using a sample of 5000 patients and 500,000 observations. The performance evaluation results further showed that the proposed model achieves higher throughput and lower latency compared to existing approaches when the workload is varied up to 10,000 transactions.*

Research limitations - *In future works, we expect to perform refined simulations so that our model is tested more rigorously. We could do this by downloading and testing a wider range of various blockchain frameworks in a verified setting, for instance, using the blockchain instance of Amazon Web Services' blockchain.*

Originality/value - *Unlike previous models, the current design focuses on decision of system chaincodes and other blockchain interfacing components. This study reviews the importance of blockchains as they provide infinite possibilities to individuals, companies, and governments. More concretely, issues addressed in this research include authentication management, identity management, and cryptocurrency. Additionally, the main features of blockchain technology and implementations in the health sector were explored in the paper.*

Keywords : Blockchain, Healthcare datasets, Directed Acyclic Graph, Access Control.

Micro-Credential Digital Badge with Blockchain in Higher Learning Education

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Abstract

Background - *The micro-credential is one of the credentialing systems that is based on professional learning with competency.*

Purpose - *This allows one to use digital badges to recognise and reward learner's skills and achievement upon the completion of the learning subject. Multiple level of learning contexts can use digital badges, specifically open badges. This is shareable between different stakeholders, such as educators, learners and learning institutions.*

Design/methodology/approach - *This research based on qualitative research. The competency-based learning with automatic association of skill-based badges to provide student mastery evidence along with the blockchain evaluation environment. Therefore, the metadata of a badge will contain necessary information such as badge title, purpose, category, transferability, learning objectives and issuer organisation, which are the top priorities of higher learning badges. This information is obtain from the e-learning portal and stored in the blockchain database. The data is collected based on the learners feedback upon using the e-learning portal.*

Findings - *This paper contributes to the development (modelling and implementation) of a micro credential app in a blockchain environment. The results show that this system is feasible and increases learners' interest in the subject taken. The system has been tested out on 19 higher education learners. The result is recorded via case study questions. The result shows 94.8% of the participants agree with the technology as it is important in the future and user friendly.*

Research limitations - *The limitation of this research is the analytics part of e-learning portal, and the intelligent part of the blockchain environment. These limitations can be used to improve future development in the context of micro credentials for higher learning education.*

Originality/value - *The new improved design of digital badge architecture that is focus to on the blockchain environment. In addition, the badges are design based on the intrinsic motivation to increase learners motivation in using online learning portal.*

Keywords : Blockchain, Digital Badge, E-learning, Micro-credentials, Online Learning Portal

Track: Internet of Things (IoT)

Edge Computing (EC) for Vehicle to Everything (V2X): A Short Review

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Abstract

Background - *Vehicle to Everything (V2X) communications and services have gained a significant interest from various stakeholders for future Intelligent Transport Systems (ITS). V2X serves to organize communication and interaction between vehicles (V2V), infrastructure (V2I), pedestrians (V2P) and networks (V2N). Hence, having multiple communications can generate a huge amount of data for processing and distribution. Besides, such services may have performance conditions with regard to dynamic handover and low latency communications. Edge Computing (EC) may be a feasible option to address this challenge to allow V2X information to be transmitted across vehicles.*

Purpose - *As the existing comparative studies do not cover the applicability of EC for V2X. This work explores EC approaches to determine the applicability for V2X communication and services.*

Design/methodology/approach - *EC allows devices to carry out part or all of the data processing at the point where data is collected. This work focuses on several approaches that have been reported in the literature on the successful implementation of EC. Each approaches is described individually and compared according to its implementation.*

Findings - *The findings of this work indicate that most approaches can simulate the EC positioning in accordance with predefined scenarios. These include the use of Mobile Edge Computing, Cloudlet and Fog Computing. However, a theoretical drawback is that crucial information in the quest for EC positioning can be overlooked and ignored for bandwidth reduction as most studies are carried out based on simulation.*

Research limitations - *The EC approaches considered in this work are limited to literature on the successful implementation for V2X communication and services.*

Originality/value - *The outcome of this work could considerably help other researchers to better characterise EC applicability for V2X communications and services.*

Keywords : Vehicle to Everything, Edge Computing, Review

Study of Component in IoT Based Implementation

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Abstract

Background - *The infrared sensor is focused on the presence of human and the distance in the smart toilet. The main issue is body orientation because when the wave is reflected on a flat surface compared to curved surface, the sensor can provide more precise performance.*

Purpose - *To explore the concept and development of an Infrared sensor, which leads to creating a new approach for a more precise and consistent sensor.*

Design/methodology/approach - *Sensor testing is done by placing the infrared sensor at the side of the cubicle's wall. The angle of the infrared sensor is measured to get the best distance accuracy. Three types of plastic covers been tested namely red, blue and red-blue combination with adjusted angles. The microcontroller is programmed to calculate the distance and presence of the human body inside the cubicle.*

Findings - *For sitting toilet, angle starts at 168˚ to 174˚ while squatting toilet starts at 174˚ to 180˚. The angle of the sensor is different between squatting and sitting toilet is due to positions of the human body and toilet bowl itself . Red cover can get nearly to the actual distance at angle 172˚. At angle 170˚, infrared can detect a man body but not a woman body. For the blue cover, it gives the same best angle which is 172˚ but the sensor distance higher than the red cover. For red and blue cover combination, it gives a more accurate distance up to 150cm from the actual reading of 141cm detecting both man and woman at 172˚ angle. For squatting toilet, the actual distance is higher than squatting toilet which is 158cm. The best angle for red cover is 176˚. At angle 178˚, infrared can detect a man body but not a woman body. For the blue cover, it gives the same best angle which is 176˚ but the sensor distance higher than the red cover. Red and the blue cover combination gives more accurate distance up to 163cm from actual reading detecting both man and woman at 176˚ angle.*

Research limitations - *This project was carried out at a temperature of 30 C, which raised the error.*

Originality/value - *This work can be expanded by increasing the infrared sensor voltage*

Keywords : Infrared Sensor, Raspberry Pi, Internet of Things (IoT).

Smartic : A Smart Tool for Big Data Analytics and IoT

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[1,2,3]Multimedia University

Abstract

Background - *Internet of Things (IoT) is expanding and being deployed in almost every aspect of everyday life and producing massive amounts of heterogeneous data. To get insight by analyzing data, Machine Learning (ML) algorithms are getting more attention in data cleaning and Big Data Analytics.*

Purpose - *Data preparation is one of the most time-consuming measures, and ML model building and data analytics performance greatly depend on clean and quality data. As statistics models are slow in big data and ML based data retrieval also time consuming, we propose sample-based Approximate Query Processing to clean and impute data. Our proposed tool, Smartic includes a fast data preparation algorithm using statistics techniques and a more accurate and robust ML model for Big Data Analytics.*

Design/methodology/approach - *In this study, statistical methods are equipped to fix the datasets. The Sample-based Approximate Query Processing is integrated to alleviate errors in analysis and predictions. ML classification models and regression models are trained and used to repair, categorize and predict the closest possible value. Prepared data by different techniques are fed into ML analytics models and accuracy is compared against different data preparation techniques. Implementation of the algorithms done in the Jupyter Notebook environment and Python is used for scripting. Available libraries and tools such as Pandas, Scikit-learn, matplotlib, etc. used for building, testing, and visualization purposes.*

Findings - *1) Statistical techniques are very effective but slow in big data, 2) The sample-based technique may create approximation errors but it is faster than traditional statistics, 3) Data preparation process results fairly good cleaned and complete data, 4) Smartic data value imputation is faster than ML based missing value imputation model, 5) ML model performance trained on data cleaned by sample-based technique is significantly higher and stable.*

Research limitations - *The study is performed using datasets selected from the UCI repository. In the future evaluation can be done in data sets collected from IoT environments.*

Originality/value - *Smartic is an effective combination of data preparation and data analytics tools built with Machine Learning Algorithms based on pure statistical techniques.*

Keywords : Big Data Analytics, IoT, Data Preparation, Deep Clean, Smartic

Synthetic Data Generation for Edge Analytics

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Abstract

Background - *Internet of Things (IoT) edge analytics enables computation and data storage available closer to source of data generation at IoT system. This provides better data control from sensors, accelerate analysis, predictions and actions at reduced cost. The use of machine learning techniques in edge servers to analytics task offloading is a promising approach to reduce latency and energy consumption.*

Purpose - *However, the key challenges in use of machine learning in edge analytics include difficulties of finding real world datasets to implement a closer environment predictive model. This brings an impact to undeniably slower adoption of machine learning methods in IoT edge analytics. Thus, a realistic synthetic datasets generation can leverage the needs to accelerate methodological use of machine learning in edge analytics.*

Design/methodology/approach - *In this paper, we conceptualise the synthetic data contained similar parameters as data that has been generated from IoT sensors data. We use existing air quality dataset that shows measure from temperature and gas sensors. This real time dataset which is comprised of values accurate air quality index (AQI) component and ppm concentration of different polluting gases. This dataset is pre-processed using imputation method to solve missing data issue. We build a model to capture the distribution of variables and structure of this real dataset to generate the synthetic data.*

Findings - *Based on benchmark dataset, a comparative predictive model is created using synthetic dataset and original dataset. Analysis of synthetic dataset predictive model show that it successfully can be deployed to edge analytics purposes replacing real world datasets. There are no significant difference between real world dataset compared synthetic dataset*

Research limitations - *Synthetic data is generated from existing dataset requires modification to suit the edge computing requirements.*

Originality/value - *Scarcity of having a high-quality datasets limits edge analytic process to produce accurate results. Synthetic datasets can reduce this limitation and further accelerate faster introduction of predictive model IoT environment.*

Keywords : Synthetic Data Generation, Internet of Things, Edge Analytics, Predictive Model, Machine Learning.

Track: Big Data

Modified Recurrent Equation-based Cubic Spline Interpolation for Missing Data Recovery in Phasor Measurement Unit (PMU)

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[1,2,3]Multimedia University

Abstract

Background - *A Phasor Measurement Unit (PMU) requires quality data for proper functioning and decision making of the smart grid systems. Missing PMU data may lead to improper actions or even blackouts. In this work, a modified recurrent equation-based cubic spline interpolation technique for recovering missing PMU data is proposed.*

Purpose - *Although the Conventional Cubic Spline Interpolation (CCSI) is suitable for recovering missing PMU data, it does not give consistent results for distinct scenarios. The computational complexity increases non-linearly with increasing data size. Hence, there is a need for a method that is consistent, accurate, and yet simple to apply.*

Design/methodology/approach - *A Modified Recurrent Equation-Based Cubic Spline Interpolation (MRECSI) technique for missing data recovery is proposed. The recurrent relation used makes the computations of spline constants simpler.*

Findings - *In the proposed method, the average Root Mean Squared Error (RMSE) values are 1808.35, 3421.12, and 8804.14 when recovering PMU data where 10%, 20%, and 30% of its data is missing. These results are similar to the CCSI technique with values of 1790.40, 3421.01, and 8675.38. However, for the same performance, the proposed method shows significant improvements in its Time of Calculation (ToC). The average ToCs for the proposed method are 3.12, 2.77, and 2.02 seconds when recovering 10%, 20%, and 30% of its missing data. By comparison, CCSI has ToC values of 27.22, 21.50, and 17.47 seconds, respectively. The proposed method reduced the ToC by a factor of approximately 10 times. Hence, the proposed method performs just as well but much faster, which is a critical factor in the analysis of PMU data.*

Research limitations - *Although the proposed method is less complex and yet able to accurately recover missing data, it has been only applied in batch data processing mode. To take advantage of the recurrent relations, our future work shall focus on extending the proposed method to work in real-time PMU data.*

Originality/value - *The proposed method can retrieve any number of missing values at any location using observed data with a minimal number of calculations.*

Keywords : Phasor Measurement Unit, Missing data, Data recovery, Smart grid.

Micro-Segmentation of E-Commerce Customers using RFM Models and K-Means Clustering

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Abstract

Background - *Customer segmentation lets a company concentrate on an individual community, rather than on a large one (Patel, 2019). Smaller customer group sizes have helped the E-commerce companies understand more about its preferences and desires. Companies are building customer segments, or micro-segments, to create more tailored ads for specific customer groups and meet consumers in a more personalized way. (LeBlanc, 2019) suggested additional segmenting of the customers using Recency, Frequency, Monetary (RFM), High-Value Customers (HVC) and Customer Status to improve the identification of customer profiles for ecommerce activities.*

Purpose - *The main goal of this project is to improve the segmentation of ecommerce customers, by enhancing the segmentation of the customers using RFM models and K-Means clustering methods.*

Design/methodology/approach - *A dataset of ecommerce customer information that includes customer orders and payments is used in this study. The initial segmentation using K-Means clustering groups customers into homogenous segments that is analysed using RFM modelling. The initial segments are refined in the micro-segmentation process using K-Means clustering to produce micro-segments, that are analysed using RFM modelling and compared against the results from the initial segmentation of the dataset.*

Findings - *The initial segmentation produced five clusters with the best customer having RFM score of 444 and the worst customer having a score of 111. After micro-segmentation, RFM analysis identified that clusters 1 and 3 are not recent, frequent and high spending customers. For cluster 2, only 8,152 customers have purchased within 100 days and the rest spent more than $500. Cluster 4 are considered the best customers with recent spending within 17 days and more than $1500, and a maximum of $13600. This cluster is the closest to the initial RFM score. Finally, cluster 5 has customers with good recent purchases and moderate spendings.*

Research limitations - *The limitation of RFM modelling is the lack of "˜smart linking' between the three indices, and possible improvement with the addition of length variable.*

Originality/value - *By using the RFM analysis and K-Means technique a more in-depth insight was gained through the micro-segmentation where a smaller group of customers purchasing behaviour was identified.*

Keywords : Customer segmentation, RFM modelling, K-Means clustering

Restaurant Recommendation System using Collaborative Filtering Algorithms

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Abstract

Background - *This research project is a research study on the restaurant recommendation systems (RRS) based on the model-based collaborative filtering (CF) algorithms that uses the scraped dataset of restaurants located in Kuala Lumpur (KL). Research on RRS based on the model-based CF algorithms is very limited. Thus, this research project is carried out to bridge the research gap by obtaining the best prediction performance among the five model-based CF algorithms with the use of the surprise library. Statistical analysis is carried out to compare the accuracy of the algorithms.*

Purpose - *This research project aims to build an RRS using the model-based CF algorithms, identify the parameters tuning on the CF algorithms, benchmark the various CF algorithms using the surprise library and carry out the prediction performance of the recommendations.*

Design/methodology/approach - *This research project firstly starts with the data collection, data pre-processing and data exploration. The collected data from Yelp website is used to fit into the model. A scrape dataset of KL restaurants is then obtained to fit into the model. The metrics evaluation on the CF algorithms is performed with statistical analysis, namely mean absolute error, root-mean absolute error and coefficient of determination. Subsequently, the predictions for user's rating and performances through the term frequency inverse document frequency and surprise library are carried out.*

Findings - *The singular vector algorithm is found to give the best results in the root mean absolute error and coefficient of determination based on both Yelp data and KL data although the run time is longer compared to the other CF algorithms.*

Research limitations - *Our research focuses on those restaurants located in the KL area. Therefore, the dataset is not large enough to be tested on the algorithms. To evaluate the best readings for all algorithms, a bigger file size of data is required to test and run.*

Originality/value - *The research project is firstly tested on the Yelp dataset by evaluating the algorithms using the model-based approach. Once the model is proven, the simulated KL dataset is generated for the model-based CF algorithms and continues with the evaluation of the algorithms.*

Keywords : restaurant recommender system, collaborative filtering algorithm, term frequency inverse document frequency, singular values decomposition, prediction performance

Track: Computer Science

Vision Based Hand Gesture Recognition: A Review

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Abstract

Background - *Lately, vision-driven hand gesture recognition has drawn a lot of attention from researchers. But, the attainments of a robust vision-driven hand gesture recognition system in real-time have remained a challenge, owing to the various limitations.*

Purpose - *This paper aims to expose the limitations faced in image acquisition through the use of camera, image segmentation and tracking, feature extraction, and gesture classification stage of vision-driven hand gesture recognitions in various camera orientations.*

Design/methodology/approach - *In this article, we put a collection of the most noticeable research works related to gesture recognition. We make different categories for the gesture recognition-related researches with subcategories to create a valuable resource in this domain. We summarise and analyze the methodologies in tabular form. After comparing the similar types of methodologies in the gesture recognition field we try to draw conclusions based on our findings.*

Findings - *This research will provide reference material for researchers in the domain to advance robust vision-based hand gesture recognition systems amidst various conditions.*

Research limitations - *The limitations considered comprise multiple text and interpretations of gestures and complex non-rigid hand characteristics.*

Originality/value - *In this work, we discuss all kinds of gesture recognition techniques and especially in different camera orientations, which makes this paper unique compared to the state–of–the–art researches.*

Keywords : Gesture Recognition, Feature extraction, Tracking, Gesture Classification, and Different Camera Orientation

A Systematic Review on Agile Requirements Engineering for Software Security

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Abstract

Background - *Agile software development method (ASD) is fast becoming the de-facto method for software development worldwide. However, while users or product owners typically excel in providing functional requirements, they lack the knowledge and skills to meet quality requirements. The shortcoming, among others, presents a severe threat to a project or software as requirements engineering in the context of non-functional requirements may not be adequate, especially when it relates to quality requirements such as security. Security requirements are often bolted on as an afterthought whenever there is a breach or violation of regulations. The exploitation of security vulnerabilities results in organizations suffering reputational loss. Often, the cost to fix a security deficiency at a later stage is much higher in both time and materials.*

Purpose - *To investigate the challenges in eliciting requirements using ASD and the relevant proposals to improve the process that exist in the literature in the effort to aggregate evidence of effective requirements elicitation techniques for security requirements.*

Design/methodology/approach - *Major databases were searched using keywords of agile, requirements engineering, security and assurance to find conference and journal papers for the past five years. The inclusion and exclusion criteria as well as quality assessment scoring criteria are established.*

Findings - *ASD security requirements elicitation techniques have matured over the years. Proposals for improvement are: Include additional artifacts such as abuser stories or misuse cases; Add an expert or a team of experts; Train the developers; Changing the mindset of people running the business to realize the value of secure software. It is also recommended to use existing frameworks or standards to guide security requirements elicitation. Hence, it is timely to consider these proposals for a better approach to elicit security requirements that may result in a more secure software.*

Research limitations - *Aside from time constraint, there is limited literature dealing specifically on security requirements elicitation. Depending on the context of the reviewed literature, non-functional quality requirements that are not explicitly stated as security requirements are classified as security requirements.*

Originality/value - *At present, there is no systematic literature review that deals explicitly with the elicitation of security requirements in ASD.*

Keywords : systematic review, requirements engineering, agile method, security, assurance

Track: Data mining

Bioinformatic Analysis of SARS-CoV-2 Nonsynonymous Mutations

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Abstract

Background - *COVID-19 outbreak caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) emerged from Wuhan, China, beginning around December 2019. Although some nonsynonymous mutations in the SARS-CoV-2 genome have been identified, the role of these mutations on the functions and structures of SARS-CoV-2 proteins remain unclear.*

Purpose - *The main objective of this analysis is to predict the biological consequences of nonsynonymous mutations on the SARS-CoV-2 proteins.*

Design/methodology/approach - *A total of 30,229 SARS-CoV-2 genomic sequences with the submission date from 2020-01-01 to 2021-03-21 were retrieved from the Global Initiative on Sharing all Influenza Data (GISAID) database. Multiple sequence alignment of the sequences was performed using rapid calculation in MAFFT which can align more than 20,000 sequences. After that, the mutations and their frequency were identified using a Python script. The nonsynonymous mutations are analyzed with protein structure visualization analysis, protein structure stability analysis and deleteriousness of the nonsynonymous mutation prediction using SIFT 4G.*

Findings - *A total of 231 nonsynonymous mutations were identified. Most of the mutations were mainly found in ORF1a and ORF1b. The D614G mutation located in Spike protein recorded the highest frequency of 28,022 among all, followed by P323L mutation in NSP12 and R203K mutation in Nucleocapsid protein. The prediction analysis shows that Q57H mutation in ORF3a and S194L mutation in Nucleocapsid protein may be deleterious to the structure of viral protein. On the other hand, the L3606F mutant in NSP6 and Q57H mutant in ORF3a changes from open to close state compared to wild type structure. In general, most of the single nonsynonymous mutations identified are found to have little effect on the structure and function of the proteins.*

Research limitations - *Since most of the reported variants contain more than one mutation, a comprehensive analysis of a combination of nonsynonymous mutations on the SARS-CoV-2 should be performed in the future.*

Originality/value - *This paper is one of the first studies to predict the effect of nonsynonymous mutations on the structure and functions of SARS-CoV-2 proteins and deleteriousness of SARS-CoV-2 proteins using SARS-CoV-2 genome for SIFT 4G.*

Keywords : SARS-CoV-2, nonsynonymous mutations

Bioinformatic Analysis of SARS-CoV-2 Synonymous Mutations

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Abstract

Background - *Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) caused a global pandemic since it emerged from China in December 2019. SARS-CoV-2 is a single-stranded RNA virus, which makes it more prone to mutate. Multiple studies have been done to identify synonymous mutations in the SARS-CoV-2 genomes. However, the biological roles of these mutations of COVID-19 virus remains unclear.*

Purpose - *The goal of this study is to predict the effects of synonymous mutations on the virus.*

Design/methodology/approach - *A total of 30,229 SARS-CoV-2 genomic sequences were retrieved from the Global Initiative on Sharing all Influenza Data (GISAID) database. Multiple sequence alignment of the sequences was conducted using MAFFT with rapid calculation, which supports more than 20,000 sequences with approximately 30,000 sites. Then, the mutations and their respective frequency were identified using a Python script. RNA secondary structures and their base pairing probabilities were predicted to see if these mutations affect the structure and stability. The minimum free energy (MFE) was calculated to compare the RNA folding stability between the wild type and the mutant.*

Findings - *A total of 150 synonymous mutations with different frequencies were identified. Most of the mutations were mainly found in ORF1a and ORF1b. The C3037T mutation located in ORF1a recorded the highest frequency of 28,054 among all, followed by C313T mutation and C9286T mutation in the same ORF1a. Most of the individual synonymous mutations identified are found to have little effect on the RNA folding and RNA stability of the virus except for the C26735T mutation in the M gene. C26735T forms an extra multibranch loop in the secondary structure in the mutant, yielding a less stable RNA structure.*

Research limitations - *It is hard to link the mutations to the clinical features due to the restriction to access these databases. Hence, it has been suggested that in vivo and in vitro experimental studies can be done in future to determine the effects of these mutations on the disease pathogenesis.*

Originality/value - *This paper is the first study to predict the effects of synonymous mutations of SARS-CoV-2 genome.*

Keywords : SARS-CoV-2, Synonymous mutations

An Enhanced Stacking Classifiers System for Credit Card Frauds Detection

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Abstract

Background - *Credit cards remain the preferred payment method by many people nowadays. Without handling credit cards carefully, people may face severe consequences such as credit card frauds. Credit card frauds involve the illegal use of credit cards without the owner's knowledge.*

Purpose - *Credit card fraud is estimated to exceed a $35.5 billion loss globally in 2020. It has resulted in direct or indirect financial loss to its holders. Hence, a detection system capable of analysing and identifying fraudulent behaviour in credit card activities is highly preferable.*

Design/methodology/approach - *Credit card data are not easy to handle due to their inherited problems: (i) unbalanced class distributions and (ii) overlapping classes. General learning algorithms may not be able to address and handle the problems well. This study addresses these problems using an Enhanced Stacking Classifiers System (ESCS) that comprises two sequential components. The first component are classifiers excellent in detecting normal credit card transactions (the majority class), while the second component contains stacking classifiers that are good in distinguishing credit card fraud (the minority class). Such sequential components thus mitigated the two inherited problems of credit card data. The ESCS can improve the fraud detection via the second component, which contains more superior and sensitive classifiers to identify the misclassified fraud transactions from the first classifier. The meta-classifier then combines the decisions of the base classifiers from the components to produce the final detections.*

Findings - *We evaluated the ESCS using the benchmark Credit Card Fraud (CCF) data set that exhibits the two problems. The highest TPR for detecting credit card frauds is 81%, which outperforms the single classifiers.*

Research limitations - *The open credit card fraud data is scarce due to business reasons and security concerns.*

Originality/value - *An ESCS, with an additional component added to the stacking classifiers, is proposed to improve fraud detection on the credit card data.*

Keywords : Enhanced Stacking Classifiers System, Unbalanced Class Distribution, Overlapping Classes, Credit Card Frauds

Performance Profiling of the Malaysian Unit Trust Funds with Data Mining Techniques

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Abstract

Background - *Millennials are exposed to many investment opportunities, and they have shown their interest in gaining more incomes via investment. One popular investment avenue is unit trusts. However, analysing unit trusts' financial data and gaining valuable insights from it may not be as simple as it sounds.*

Purpose - *Analysing and selecting outstanding unit trusts is a Herculean task because not everyone has the required financial knowledge and adequate time to perform in-depth analytics on the numerous financial data. Furthermore, it is not easy to compile the performance of each unit trust available in Malaysia. The primary objective of this research is to identify unit trust funds that provide higher returns than their average peers via performance profiling.*

Design/methodology/approach - *This research proposed a performance profiling on Malaysia unit trust funds using the two data mining techniques, i.e., Expectation Maximisation (EM) and Apriori, to assist amateur retail investors to choose the right unit trust based on their risk tolerance. EM clustered the list of unit trust funds in Malaysia into several groups based on their annual financial performances. Then, it was followed by finding the rules associated with each cluster by applying Apriori. The resulted rules shall serve the purpose of profiling the clustered unit trust funds. Retail investors can then select their preferred unit trust funds based on the performance profile of the clusters*

Findings - *We used a 1-year average return to evaluate the performance of the clusters. The evaluation results indicated that the profiling could provide valuable and insightful information to retail investors with varying risk appetites.*

Research limitations - *The proposed profiling method were evaluated using the Malaysian unit trusts data only. We shall include data from the neighbouring countries in the future.*

Originality/value - *The research adopted the new profiling method, involving EM and Apriori, to speed up the selection of potential Malaysian unit trust funds.*

Keywords : unit trust funds, expectation maximisation, apriori, performance profiling

Track: Computing in Mathematics, Natural Sciences, Engineering, and Medicine

Data Fusion-based Lane Departure Warning System using Fuzzy Logic

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Abstract

Background - *Lane detection is a challenging problem due to varying lane conditions. It played a significant role in the Advanced Driver Assistance System (ADAS) that provides information like lane structure and lane position relative to the centre of the host vehicle. Lane Departure Warning (LDW) is used to alert the driver if there is any unintended lane departure from the original lane.*

Purpose - *This research aims to design a data fusion-based LDW framework for enhancing the lane departure detection rate during daytime and night-time.*

Design/methodology/approach - *Vision-based LDW is a comprehensive framework from vision-based lane detection with additional lateral offset ratio computations based on the detected X12 and X22 coordinates. The computed lateral offset ratio is used for detecting lane departure based on the predefined lane departure warning identification for vision-based LDW. Data fusion-based LDW is developed using a multi-input-single-output fuzzy logic controller. Data fusion involved lateral offset ratio and yaw acceleration response from the vision-based LDW and model-based vehicle dynamics framework.*

Findings - *Experimental results have shown that data fusion-based LDW achieved an average of 99.96% and 98.95% lane departure detection rate with 0.04% and 1.05% False Positive Rate (FPR) using road footage clips #5–#27 in daytime and night-time, respectively. The average FPR in lane departure detection using data fusion-based LDW had reduced 18.83% and 15.22% compared to vision-based LDW in daytime and night-time.*

Research limitations - *The adaptive mechanism of warning threshold regarding a variety of road structures can be developed to improve lane departure detection. The limitation is a constant warning threshold value being used in the current implementation of LDW in the vision-based LDW framework.*

Originality/value - *The data fusion-based LDW has demonstrated a novel way of reducing false lane departure detection by fusing two types of modalities in determining the correct lane departure information.*

Keywords : Lane Departure Warning, Data Fusion, Image Processing, Fuzzy Logic, Vehicle Dynamics

Track: Computing in Social Sciences, Arts, Humanities, and Profession

Exploitation of Current Game Technology for Driving Education with AI Techniques and VR

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Abstract

Background - *Simulators are games that simulate the real world in a virtual environment such as racing simulators have been widely documented to have positive effects on skill training. In education, however, there could be more to discover.*

Purpose - *Motivation behind this study is to dive into the trend of immersive learning and exploit game artificial intelligence (AI) and virtual reality (VR) to benefit driving education. A preliminary study done by the authors have proven that there is an improvement on using a driving simulator as a teaching tool for driving education as opposed to the conventional method teaching tool, printed materials. As conventional driving simulators often use a single screen setup, VR will be implemented into the driving simulator to compare the difference between conventional screen-based setups versus VR setups in this study. This work however, only has rudimentary AIs to simulate basic traffic for certain scenarios.*

Design/methodology/approach - *This work was developed in Unity, it will include parts of the syllabus from the Standardised License Exam of Malaysian Ministry of Transport, real world scenarios and a mockup city with AI traffic. The driving simulator is paired with a driving rig consisting of a steering wheel and pedals, VR will also be implemented. An experiment will be executed to investigate the effectiveness of using such methods comparing it to conventional and non-VR methods.*

Findings - *Findings of the project currently is a functioning driving simulator with VR that can accept both controller and steering wheel inputs. There are 5 circuit tracks and 2 on-the-road tracks based on the Standard Examination syllabus, 3 scenario based tracks and a limited mockup city with AI traffic. It includes an automated test mode in the syllabus part for quantitative results, the rest of the track results will require human judgement. Free practice mode is available for all tracks.*

Research limitations - *Limitations are the rudimentary AI. Future work can include more sophisticated AI systems that simulate the unpredictable behaviour of real traffic to the user to enhance immersion, challenge, and learning effectiveness.*

Originality/value - *To our best knowledge, no such study has been conducted in Malaysia yet.*

Keywords : Driving Education, Driving Simulator, AI Techniques, Virtual Reality

Interactive Augmented Reality Application for Learning Calculus

Md Asifur Rahman[1], Lew Sook Ling[2], Ooi Shih Yin[3]

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Abstract

Background - *Implementation of technology in education has transformed traditional classes into more interactive ones. Among the interactive technologies, augmented reality (AR) is one of the significant technology being used in visualising the three dimensional picture illustrated in a designated subject syllabus. The motivation of this research is promoting both human-human and human-system interactivities in learning calculus while the current literatures have focused mainly on human-system interaction.*

Purpose - *This research aims to investigate how both interactivities affect learning experience and how the learning performance get affected due to the designated learning experience.*

Design/methodology/approach - *Pre-test and post-test quasi-experimental research design was adopted for conducting this research based on non-probability convenient sampling where the data were collected through a personally administered questionnaire from the pre-university students studying in Malaysia. The subjects were exposed to a controlled environment of learning solid of revolution through an Interactive Augmented Reality Application (IARA). IARA included functions to explore three dimensional solid and multimedia video to show how those solid are being formed to promote human-system interactivity and a general chat function to promote human-human interactivity. Partial least squares path modelling was applied to evaluate the reliability and validity of research framework and also to test the hypotheses while pre and post test result of learning performance were evaluated by using SPSS.*

Findings - *The findings show that human-human interactivity has stronger impact in learning experience than the human-system interactivity with a t-value of 4.387 and 2.412 respectively. It also shows that there is a significant relationship between learning experience and learning performance where the mean average score of post-test is higher than the pre-test.*

Research limitations - *The study included 30-minute lesson through an android application with a small sample of 55 students. Thus the findings may not be generalised for a greater number of students with a longer learning time due to its nature of study.*

Originality/value - *The study provides a theoretical analysis and implications on the research framework of implementing AR application on learning experience and performance. This theoretical and educational implications can be a guide for practitioners to further understand the technology in promoting interactivity.*

Keywords : interactive learning system, augmented reality, human-human interactivity, human-system interactivity

Synchronous Display and Whiteboard-Like Freehand Writing App as Teaching Tool for Virtual Classroom Amidst the Pandemic

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Abstract

Background - *Pandemic causes most educational institutions conduct classes virtually to maintain social distancing. However, minimal educational-tailored online platforms grant teachers familiarity when conducting online classes with it. Moreover, technological pedagogical and content knowledge (TPACK) assessment is needed to explain teachers' understanding of educational technology and pedagogical content knowledge (PCK). Apparently, teachers might have egos affecting their self-assessment on TPACK.*

Purpose - *The transition for most educational institutions shifts from conventional to online classroom requires teachers adapt instantaneously on the new norm. The research evaluates if teachers can achieve better teaching outcome by using a proposed mobile interactive system (MIS) developed for this study, as an alternative approach enhancing teachers' proficiency of TPACK in online classroom. Besides, reduction of potential errors resulted by teachers' self-assessment on TPACK can be mitigated through the change of perspectives to students.*

Design/methodology/approach - *Therefore, an experiment is conducted with pre and post experiment phase. Synchronous display (SD) and whiteboard-like freehand writing (WFW) are features of the MIS integrated in experimental group. Questionnaires are distributed and a model is then formed. SPSS and SmartPLS are used for data analysis. The learning experience is treated as moderating variable which reflects self-efficacy. The model also identifies constructs that affect teachers' technology integration including their self-efficacy and their confidence towards it.*

Findings - *The findings indicate that from students' perspective, the SD and WFW improve teachers' proficiency in integrating technology into online class. The better teachers' TPK, the better their TPACK implementation when conducting classes. Based on the findings, teachers' TPK had a significant positive effect to TPACK with the inclusion of MIS in online teaching. With the use of SD and WFW in conducting classes, students' satisfaction on teachers' TPACK was enhanced while the group without those led to poorer satisfactory over teachers' TPACK.*

Research limitations - *The encoding method of the SD does not support audio.*

Originality/value - *The developed MIS with SD and WFW features grants teachers full control in virtual classroom without sacrificing teacher authority. SD and WFW allow teachers to write and share their device screen to students. Unlike Google JamBoard, teachers have a more disciplined-oriented environment.*

Keywords : Mobile Interactive System, Virtual Classroom, TPACK, Education Technology, Pandemic

A Non-Immersive Virtual Reality Training Application for Children with Autism Spectrum Disorder using Data Analytics and Rule-based System

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Abstract

Background - *Autism Spectrum Disorder (ASD) is a cognitive condition affecting many children's emotions, speech, and actions. Nowadays, many available treatment services can improve the child's development, but the effectiveness of treatment and providing convenience to all parties is difficult to reach.*

Purpose - *An alternative method, Virtual Reality with data analytics, was suggested to enhance the traditional treatment experiences and potentially improve the skills development of ASD children by applying data-driven decisions*

Design/methodology/approach - *Real-world data from 255 children with ASD were collected, and a questionnaire was distributed among parents of children with ASD for the analysis. According to their symptoms, the data are preprocessed to classify the children into three different weakness areas, and suitable games would be recommended by a rule-based system. The ASD children are trained to achieve each game objective while the therapist or parents could keep track of their performances in the application.*

Findings - *The developed application was tested with two ASD children with assistance from their parents. Both children could play all recommended games accordingly. After playing one type of game, they continued playing another game rather than repeating the same game continuously. Besides, when the players view their performance, they are motivated to play the games again while the parents could easily observe their children's progress. From the collected feedback form, both children and parents are satisfied with the overall experience of the session*

Research limitations - *The limitations of the application are it only covers three weakness areas, and the profiling systems lack questions to compute an accurate analysis of preferences. Future enhancement could be made by including more learning games covering more expansive weakness areas, including more questions in the questionnaire, and collecting more data for better personalization analysis*

Originality/value - *The application was developed as an expert system where all facts and rules implemented were extracted from various expert domains. In this case, this application mimics human intelligence when finding suitable activities or games based on ASD children's profile, symptoms, and level of ASD. Thus, the system would centralize the decision-making process with the aid of data analysis and make things more efficient by reducing the time needed to solve problems*

Keywords : non-immersive virtual reality, autism spectrum disorder, data analytics, rule-based recommender system