ABSTRACT BOOK &
CONFERENCE
PROGRAM GUIDE

Joint Conference
2021

IConGETech
INTERNATIONAL CONFERENCE ON GREEN ENGINEERING & TECHNOLOGY

IConTVET
INTERNATIONAL CONFERENCE ON TECHNICAL AND VOCATIONAL EDUCATION & TRAINING

ICAC
INTERNATIONAL CONFERENCE ON APPLIED COMPUTING

Organized by

CEGeoGTech
UNIVERSITI MALAYSIA PERLIS

UNIVERSITI MALAYSIA PERLIS

UTM
UNIVERSITI TEKNOLOGI MALAYSIA

APPLIED INDUSTRIAL ANALYTICS

2 - 6 February 2021

PREFACE

Joint Conference on Green Engineering Technology & Applied Computing 2021

This joint conference is organized simultaneously of 3rd International Conference on Green Engineering & Technology 2021 (IConGETech 2021), 3rd International Conference on Applied Computing 2021 (ICAC2021) and 1st International Conference on Technical and Vocational Education & Training (ICONTVET 2021). This joint conference invites papers from various fields in green engineering & technology, applied computing, technical and vocational education & training, and related fields. The primary goal of the conference is to provide the opportunities for academicians, professionals, practitioners and policy makers in the engineering and computing fields to share their thoughts and empirical works both to those involved in their field or those interested in the subject being researched.

The objectives of this Joint conference are:

1. To provide a forum for researchers, educators, students and industries to share and exchange ideas and research findings in related fields of researches.
2. To give an opportunity to both academia and industries to communicate on problems faced in current research and the industries.
3. To create networks and stimulate potential collaborations between researchers in the same field of research.

International Conference on Green Engineering & Technology 2021 (IConGETech 2021) will foster the progress in green engineering and related technology by contributing your expertise to what promises to be a very comprehensive and exciting meeting. The aim of the IConGETech 2021 is exploring the advances and

challenges in Green Engineering & Technology between academia, scientists and engineers by bringing together again the world class researchers and Industrial heads to discuss the latest developments and innovations in the fields of related field of research works.

International Conference on Applied Computing 2021 (ICAC 2021) aims to address the main issues of concern within the applied computing area and related fields. This conference offers a great opportunity to bring together professors, researchers, and scholars around the globe, having a great platform to deliver the latest innovative research result and the most recent development and trends in applied computing. We cordially invite all prospective authors to submit their original manuscripts to ICAC 2021.

International Conference on Technical and Vocational Education & Training (ICONTVET 2021) focused to bringing together a significant number of diverse scholars from engineering, sciences and TVET backgrounds. The conference provides an exceptional value for researchers, students, academics and industries. We take a great pleasure in welcoming academic scientists, researchers, designers, students, technologists and experts of related fields. The aim of IConTVET 2021 is to explore the advances and share knowledge in the state-of-the-art of engineering, sciences and TVET backgrounds. This conference will be a platform for Industrial heads to discuss the latest developments and innovations in the fields of related field of research works.

PROGRAM BOOK

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Part I

WELCOMING REMARKS

LEADER OF CEGeoGTech

Bismillahirrahmanirrahim

Assalamualaikum Warahamatullahi Wabarakatuh

I would like to extend a warm welcome to all guests, speakers and participants to the **3rd Joint Conference on Green Engineering Technology & Applied Computing (IConGETech & ICAC 2021)** and **1st International Conference on Technical and Vocational Education & Training (IconTVET 2021)** which jointly organized by Center of Excellence Geopolymer and Green Technology (CEGeoGTech), Universiti Malaysia Perlis (UniMAP) and Applied Industrial Analytics Research Group, Universiti Teknologi Malaysia (UTM).

IConGETech 2021, ICAC 2021 and IConTVET 2021 aims to bring together technologist, researchers and professionals from the

academic, industrial and public sectors in the context of multi and inter-disciplinary forum and discussions. This event will provide an excellent opportunity of knowledge sharing and research ideas exchange in the field of engineering, science, and technology especially regarding updated technology for a better quality of life to meet future challenges.

It is hoped that this conference will be the benchmark for us to build a strong networking between researchers, academic staff and industry.

Finally, congratulations to the working committee and everybody who have supported our efforts in realizing this symposium. For participants from all over the world, I wish you a memorable stay in Bangkok.

Associate Professor Ir. Dr. Shayfull Zamree Abd Rahim
Leader
Center of Excellence Geopolymer and Green Technology (CEGeoGTech)
Universiti Malaysia Perlis (UniMAP)

Part II

CONFERENCE SCHEDULE
February 04th, 2021

Time	Activity	Link
Opening Ceremony		
0900 – 0915	- Recitation of Do'a - Welcoming Speech by **Prof. Ir. Ts. Dr. R Badlishah Ahmad (Vice Chancellor of UniMAP)**	meet.google.com/ret-psmf-ftf
0920 - 0940	**Keynote 1** by **Asst. Prof. Dr Mehmet Erdi Korkmaz** Fakültesi, Makine Mühendisliği, Karabük Üniversitesi, Turkey.	
0940 - 1000	**Keynote 2** by **Dr Yusliza Yusof** School of Computing, Faculty of Engineering Universiti Teknologi Malaysia (UTM), Malaysia.	
1000 - 1020	**Keynote 3** by **Assoc. Prof. Dr. Mohammad Rusdi Bin Mohd Nasir** Faculty of Architecture and Ekistics, Universiti Malaysia Kelantan.	
1020 - 1040	**Keynote 4** by **Assoc. Prof. Dr Nordin Jamaludin** Faculty of Engineering & Built Environment, Universiti Kebangsaan Malaysia.	
1040 – 1100	**Keynote 5** by **Assoc. Prof. Dr Zuraida Abal Abas** Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka (UTeM), Malaysia.	
1100 – 1120	**Keynote 6** by **Assoc. Prof. Dr Irna Farikah** Faculty of Engineering, Universitas PGRI Semarang, Indonesia.	
1120 – 1140	**Keynote 7** by **Assoc. Prof. Dr Nor Azman Ismail** **School of Computing, Faculty of Engineering,** **Universiti Teknologi Malaysia (UTM)**	
1140 – 1200	**Invited Speaker 1** by **Dr. Mohd Azlan Bin Suhaimi** School of Mechanical Engineering, Universiti Teknologi Malaysia (UTM), Malaysia.	

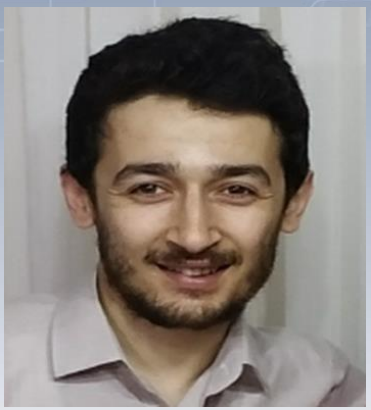
Time	Activity	Link
1200 – 1220	**Invited Speaker 2** by **Prof Madya Dr Harith bin Amlus** Faculty of Applied and Human Sciences, Universiti Malaysia Perlis.	meet.google.com/ret-psmf-ftf
1220 – 1240	**Invited Speaker 3** by **Dr Khairul Anuwar Wahid** Mechanical Engineering Unit, Universiti Kuala Lumpur Malaysia France Institute (UniKL MFI)	
1240 – 1300	**Invited Speaker 4** by **Dr Nor Hasrul Akhmal Ngadiman** School of Mechanical Engineering, Universiti Teknologi Malaysia (UTM), Malaysia.	
PARALLEL SESSION, THURSDAY (04 FEBRUARY 2021)		
1300	**PARALLEL SESSION 1** Presenters from IConGETech 2021	meet.google.com/som-ectt-sbb
1300	**PARALLEL SESSION 2** Presenters from IConGETech 2021	meet.google.com/jje-jrag-bne
1300	**PARALLEL SESSION 3** Presenters from IConGETech 2021	meet.google.com/kir-avrg-ebs
1300	**PARALLEL SESSION 4** Presenters from IConTVET 2021	meet.google.com/rrx-uovj-zqj
1400 - 1600	**Session 1: Zoom Channel 1 (ICAC 2021)** Presenters from ICAC 2021	https://bit.ly/2MqZGN2
1400 - 1600	**Session 1: Zoom Channel 2 (ICAC 2021)** Presenters from ICAC 2021	https://bit.ly/3rcoSWg
1630 - 1800	**Session 2: Zoom Channel 1 (ICAC 2021)** Presenters from ICAC 2021	https://bit.ly/2MqZGN2
1630 - 1800	**Session 2: Zoom Channel 2 (ICAC 2021)** Presenters from ICAC 2021	https://bit.ly/3rcoSWg
PARALLEL SESSION, FRIDAY (05 FEBRUARY 2021)		
0900 - 1045	**Session 3: Zoom Channel 1 (ICAC 2021)** Presenters from ICAC 2021	https://bit.ly/2MqZGN2
0900 - 1045	**Session 3: Zoom Channel 2 (ICAC 2021)** Presenters from ICAC 2021	https://bit.ly/3rcoSWg

Time	Activity	Link
1100 - 1230	**Session 4: Zoom Channel 1 (ICAC 2021)** Presenters from ICAC 2021	https://bit.ly/2MqZGN2
1100 - 1230	**Session 4: Zoom Channel 2 (ICAC 2021)** Presenters from ICAC 2021	https://bit.ly/3rcoSWg
1430 - 1530	**Session 5: Zoom Channel 1 (ICAC 2021)** Presenters from ICAC 2021	https://bit.ly/2MqZGN2
1530 - 1635	**Closing Ceremony: Zoom Channel 1 (ICAC 2021)**	https://bit.ly/2MqZGN2

Part III

KEYNOTE SPEAKER 1

Asst. Prof. Dr MEHMET ERDİ KORKMAZ
Karabük Üniversitesi, TURKEY



Dr. Mehmet Erdi Korkmaz is currently working with Mühendislik Fakültesi, Makine Mühendisliği, Karabük Üniversitesi, TURKEY since 2018. He has graduated from his PhD studies focusing on the determination of material constitutive equation parameters of Nickel based Super Alloy (Nimonic 80A) and the investigation on its applicability. His field of interest is on mechanical and manufacturing engineering. Dr Korkmaz has published in numerous publications including SCI, SSCI, impact-factor and AHCI indexed journals. Apart from his publications, he has been supporting a number of research projects under the higher educations of Turkey. The conference is honoured to receive Dr Korkmaz as the keynote speaker for this first-time conference organized.

Title: Investigation of Tensile Johnson-Cook Model Parameters for Nimonic 80A superalloy

Abstract. Developing high temperature technology increases the need for high temperature resistant materials. Nimonic 80A alloy is generally preferred due to its high creep resistance, oxidation resistance and high resistance to high temperature corrosion. The study determines the tensile constitutive equation (JC parameters) of Nimonic 80 A superalloys. Johnson Cook (JC) model is preferred amongst the various material constitutve equations (Zerille Armstrong, Bordner Partom, JC model). Three different kinds of tensile experiment were performed to identify the model parameters. These are quasi-static tensile experiments applied at room temperatures. These experiments were carried out at 0.001, 0.01 and 0.1 s^{-1} strain rates. Therefore, the reference strain rate for all experiments was selected to be 10^{-3}. As a second test, tensile experiments were conducted at room temperature at high strain rates (102 ~ 103 s^{-1}) using the Split Hopkinson pressure bar (SHPB). Lastly, tensile experiments were conducted at high temperatures (300 ~ 900 °C) at 0.001 s^{-1}. It was observed whether all tests are compatible with each other or not, and so five Johnson-Cook (JC) parameters of Nimonic 80 A alloy were identified via the data found from the experiments. After determination of parameters, tensile test simulations by finite element method (FEM) were performed in ANSYS Workbench. As a result, the accuracy of the JC parameters is verified since there is a deviation of 2.84% between the experimental and the simulation results.

KEYNOTE SPEAKER 2

Dr YUSLIZA YUSOF
School of Computing, Faculty of Engineering
Universiti Teknologi Malaysia (UTM), Malaysia.

Yusliza Yusoff is a Senior Lecturer in School of Computing, Universiti Teknologi Malaysia, where she has devoted for the last 10 years. She has extensive experience in Computer Science area. Specialization in optimization, prediction, neural network and multi objective algorithms. She received BSc. of Computer Science and System Engineering from Muroran Institute of Technology, Japan, in 2007. Two years and eight months working experience in Panasonic AVC Network Pasir Gudang, Johor Bahru, Malaysia as an Engineer II in Software Section of Research and Development Department. Appointed as a Tutor in Universiti Teknologi Malaysia (UTM) in 2010. She obtained her Master degree (Computer Science) and Doctor of Philosophy (Computer Science) as the best student receiver award from UTM in 2013 and 2017 respectively. She received Erasmus Mundus Scholarship award in 2014 for a ten months attachment program in Hochschule Darmstadt University of Applied Science, Germany.

Title: Multi Objective Algorithm for Prediction of Young Developing Cyclist Sports Performance

Abstract. The increasing popularity of cycling on Malaysian roads, trails and velodrome has also seen an increase in the number of young cycling athletes. However, the number of Malaysian professional cyclist is not impressive. This arguably dues to the insufficient platform to evolved the cyclist potential as there is limited information to analysed on improving the young cyclists sports performance. Traditionally, the performances of the athletes are 100% based on the coaching advices. The requirement on one-to-one coaching has resulted to slow development of cyclist potential due to limited number of coaches in our sport institution. There is a demand on computational approach on performance advices so that the young athletes can monitor their own individual performance. Therefore, this research is proposed to improve the performance of young cyclist. The performance of young developing athletes is predicted using collected data of semi-professional cyclist. Multi-objective algorithms are proposed to model and solve multi objective problems in sports prediction. The enhanced multi objective algorithms has potential to give good prediction result of sports performance for both physiological and bio-mechanical with optimal sports performance parameters.

KEYNOTE SPEAKER 3

Associate Professor Dr. MOHAMMAD RUSDI BIN MOHD NASIR
Deputy Dean (Research, Innovation and Postgraduate)
Faculty of Architecture and Ekistics
Universiti Malaysia Kelantan

Dr. Mohammad Rusdi Bin Mohd Nasir is an Associate Professor in the Faculty of Architecture and Ekistics in Universiti Malaysia Kelantan. Currently, he is the Deputy Dean (Research, Innovation and Postgraduate). He graduated with his PhD in Landscape Architecture from the University of Sheffield, United Kingdom. His research interest is in horticulture therapy for the elderly and obtained various research grants from the state government of Perak and the Ministry of Higher Education Malaysia. He contributed a lot of his expertise to the community through research grants at the university level as well as at the national level. He is also actively doing volunteer work for the community

at the state and national levels. Moreover, he loves to do a collaborating program with industry and the private sector, especially in high-impact community projects. His interest and determination enabled him appointed as a reference in his field of expertise at the university and national level.

Title: Institutional roles to engaging community and industrial stakeholders to high impact community projects

Abstract. Universities play a unique role in society, providing a community of knowledge, innovation, social and economic improvement. In the event of competitive global economy and devastated impacts of a pandemic Covid-19, academic assistance for the society is critical to providing social and economic supports through various community-based projects. This paper examines some of high impact projects undertaken by Universiti Pendidikan Sultan Idris and Universiti Malaysia Kelantan with direct engagement by local community and other key stakeholders. Four impactful community-based projects were carried out such as an Edible Garden Project as horticultural therapy for elderly and mental health patients, Smart Farming in School, and 'Makeover' community project. Each project was conducted with collaboration between academic staffs and students from the university, state government authorities, staffs and students from primary schools, government hospitals and relevant agencies. The study highlights three pertinent findings: (1) knowledge-sharing and transfer of technology to advance community health, agricultural economy, and quality life, (2) university's roles to facilitate effective partnership between university community, industries, and government sectors to enhance community livelihoods and healthy lifestyle, and (3) university's goals to produce young graduates who sufficiently equipped for job markets and able to contribute back to the society. The study precisely shows invaluable roles of universities to conduct impactful projects that contribute towards social and economic

development of local community. This academically based community service learning, community voluntary participation, partnership with private industries and local government are particularly useful approaches for achieving successful university-community projects that deliver various benefits to the society.

KEYNOTE SPEAKER 4

Associate Professor Dr NORDIN JAMALUDIN
Faculty of Engineering & Built Environment, Universiti Kebangsaan Malaysia.

Dr Nordin Jamaludin is a lecturer and technical advisor currently working with Dept. of Mechanical and Material Engineering, Faculty of Engineering & Built Environment, Universiti Kebangsaan Malaysia. His areas of specialisation are integrity monitoring, analysis and assessment for engineering structures and components. He utilises the acoustic emission (AE) technique, metal magnetic memory (MMM) technology, sound and vibration analysis for integrity monitoring, analysis and assessment. He obtained his PhD in Condition Monitoring (Acoustic Emission) from Cranfield University, UK. Dr Nordin is affiliated with several professional bodies including Malaysian Society of Non-Destructive Testing, Vibration Institute, USA, Institution of

Engineers, Malaysia, Fellow of Welding Institute of Malaysia. The significant achievement of Dr Nordin is his role as pioneer in Malaysia in the area of acoustic emission (AE) technique and responsible for the establishment of Malaysian Acoustic Emission Group (MAEG), a technical group under Malaysian Society of Non-Destructive Testing (MSNT). He was formerly the board of director of MSNT and chairman of the MAEG. Furthermore, as his main national significant achievement and contribution, Dr Nordin is also the pioneer in Malaysia in the area of Metal Magnetic Memory (MMM), a Russian technology and responsible to introduce and promote the MMM technology to Malaysia and Southeast Asia. Currently, the MMM technology has been recognized by PETRONAS. Dr Nordin is the first Malaysian to obtain the Level 1 and Level 2 Certification of MMM in Southeast Asia. Dr Nordin has been active as a technical consultant for UKM Pakarunding Sdn Bhd, UKM since 1992. In addition, Dr Nordin has worked as a part time consultant and technical advisor to several local and international engineering and technology companies including MR Technology, Significant Technology, Sound and Vibration Technology (SVT Perth, Australia), Daya Concept Engineering and Fuhrend Engineering. He has been involved in the real engineering consultancy projects in Malaysia and internationally since 1992 and has extensive experience in conducting integrity monitoring, analysis and assessment projects after being involved in more than 60 projects. Specifically, he has been undergoing intensive works for integrity monitoring, analysis and assessment with Barumas Perdana Indonesia, SVT Engineering Consultants Australia, Longlands College UK, British Steel UK, Tioxide Europe Limited UK and Update International USA. In addition, he has involved in many research projects utilising AE technique, MMM technology, and sound and vibration analysis with the total accumulated research grant of approximately RM 7.0 millions since the year 2000.

Title: The Inspection of Corrosion Under Insulation (CUI) for Insulated Pipeline using Strain-Stress Analysis

Abstract. According to API RP 583 code of practice for Insulated Pipeline Inspection Programme, thermal insulation is used on the exterior of equipment and piping for a variety of reasons including, but not limited to, one or more of the following objectives including heat conservation, cold conservation, freeze protection/heat tracing, condensation control, acoustic (noise) reduction, fire protection and process control. Corrosion under insulation (CUI) is defined as the external corrosion of piping and vessels that occurs when water gets trapped beneath insulation. CUI damage takes the form of localized external corrosion in carbon and low alloy steels. Conventional Non-destructive testing (NDT) inspection of insulated vessels and piping has been a major challenge to be solved until today. Conventional techniques such as profile radiography and ultrasonics often are impractical or cost-prohibitive because of limited productivity, insulation removal cost or temperature restraints. The most current practice that has been done are based on sampling point on which area that have the highest risk exposed to CUI. Then, the insulated area of sampling point will be open up for visual inspection approach. At the moment, there's also a screening technology that has been developed to detect the area that exposed to CUI. The approach that has been used based on this technology also based on sampling point approach. The common practice in estimating the failure probability due to CUI follows the standard of API 581, it is also recognised that this method to assess of failure due to CUI is rather subjective. This approach does not provide a means for quantitatively establishing the future reliability levels for the insulated pipeline which can be employed as a basis for optimising inspection intervals. For quantitative failure probability assessment, the major limitation is that the failure probabilities are

estimated based on the historical data where those failure data is typically very limited. Hence, there's a need for the client/asset owner to conduct a baseline inspection using screening technology which covers all the insulated pipeline facilities with 100% scanning approach as recommended by Fraser Hardie (2009). Most of the technology including Long Range UT (LRUT), Pulse Eddy Current, Radiography that are available as per API RP 583 are not practical to be used for 100% scanning for insulated pipeline including. Hence, an emerging technology known as Strain-Stress Analysis technology can be used in solving the above issues. The Strain-Stress Analysis technology can be a practical solution to assist the client/plant owner/asset owner with a baseline inspection programme for insulated equipment, pipeline and vessel. The Strain-Stress Analysis introduces a new approach of inspection whereby it identifies the stress concentration zones that represent the area concern in the insulated pipelines. Generally, it provides the stress mapping of the structure based on passive approach. Most of the technology that are reliable in tackling CUI problems was based on qualitative approach and in handling the inspection work especially aging facilities would take a longer time. Hence, the Strain-Stress Analysis technology can be used to quantify the findings for area that expose to CUI. Since the Strain-Stress Analysis technology are used to measure the stress distribution in a structure. It is also capable to capture the stress distribution of the insulated pipelines. This paper presents the successful demonstration project in detecting CUI in the gas pipelines of the established oil and gas corporation.

KEYNOTE SPEAKER 5

Associate Prof. Dr ZURAIDA ABAL ABAS
Intelligent Computing & Analytics Department, Faculty of Information and Communication Technology,
Universiti Teknikal Malaysia Melaka (UTeM), Malaysia.

Zuraida Abal Abas is currently an Associate Professor at the Intelligent Computing & Analytics Department, Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka (UTeM). She graduated with a first-class degree in BSc in Industrial Mathematics from Universiti Teknologi Malaysia (UTM), obtained MSc in Operational Research from London School of Economics (LSE) and received PhD in Mathematics from Universiti Teknologi Malaysia (UTM). Inspired by her interest in mathematics, operational research and analytics, she is interested in expanding her research areas in multidisciplinary fields and establishing collaborative research with other institutions and industry partners.

Title: Product Network Analysis for Effective Category Management in Sports Retail Industry

Abstract. Graph analytics or also known as network analysis is the discipline that discover the relationship between objects or entities in the forms of mathematical structure of nodes and edges. This exciting analytics tool is originated from Graph theory, a branch of Discrete mathematics and has a wide variety of applications. The remarkable advantage of discovering the relationship pattern through graph model representation has gain many attentions in having actionable insight and make data driven decision. In retail industry, where data is so rich and vast, utilizing graph analytics is an advantage to gain valuable insight in so many ways. One of the applications of graph analytics or network analysis that is significant in giving insight for category management and investment in retail is Product Network Analysis. Product Network Analysis discover the relationship between all products at the network-leveled perspective using the point of sales or transaction data. This is beneficial in having a 360-degree views of all the products that are related to each other when it comes to customer purchasing behavior. Through Product Network Analysis, the retailer is able to automatically identify the following in category management domain: (1) The products that belong to the same category naturally, (2) the most important product in creating category loyalty, (3) the product that most likely to cause cross-category sales and (4) the existence of category rationalization opportunities. This talk will share on the real work of product network analysis by utilizing the centrality analysis and community detection in graph analytics in sports retail industry. Based on the knowledge discovered, some strategies are recommended for marketing purposes.

KEYNOTE SPEAKER 6

Prof Madya Dr IRNA FARIKAH
Universitas PGRI Semarang, Indonesia

Irna Farikhah, Ph.D is currently an Assistant Professor at Mechanical Engineering, Faculty of Engineering, Universitas PGRI Semarang, Indonesia. She has previously a Lecturer in Department of Physics Education, Faculty of Mathematics, Natural Sciences and Information Education, Universitas PGRI Semarang (2010-2013). In 2019, she got scholarship from Turkish government as a research fellowship in Department of Mechanical Engineering, Celal Bayar University, Turkey. In 2020, she has appointed as a visiting research fellow at the Centre of Excellent (CoE) in Geopolimer & Green Technology (CEGeoTech), Universitas Malaysia Perlis (UniMAP). In this year, she was also appointed as a Chief and Keynote speaker in International Webinar

Series of Faculty of Engineering and Informatics, Universitas PGRI Semarang. From 2019, she also a member of World Society of Sustainable Energy Technologies (WSSET).
Assistant Professor Irna Farikhah, Ph.D received her M.Sc from the Department of Physics, Faculty of Mathematic and Natural Sciences, Universitas Gadjah Mada, Yogyakarta. She hold a Ph.D degree from Tokyo University of Agriculture and Technology, TUAT, Japan majoring in System Engineering. Moreover, she published some Articles in some International Journals and Proceedings from International Conferences in Singapore, Tokyo and London.

Title: Optimization of A Heat-driven Thermoacoustic Cooler

Abstract. When an acoustic wave propagates in a narrow tube, a gas in the tube undergoes thermal interactions with the tube wall. As a result, the acoustical energy converts into thermal energy. Using the energy conversion, a heat-driven thermoacoustic cooler can be constructed. In 2002, Yazaki et. al constructed the cooler that consists of a looped tube, an engine stack, and a cooler stack. When the engine stack is differentially heated, the acoustic wave spontaneously generates. The generated acoustic wave travels along the tube and enters the cooler stack. In the stack, the acoustic power is consumed to pump heat from one side the other side of the cooler stack.
Yazaki et. al reported that the performance of it can be improved when the relative position of the stacks is varied. However, they did not measure the performance of the whole system. They also did not perform the optimization. We consider that the performance of Yazaki's cooler system can be improved by optimizing some important parameters. Therefore, in this investigation, we have optimized the system numerically. We chose five parameters to be optimized; relative position between

the stacks, radius of the engine stack, radius of the cooler stack, porosity of the engine stack, and porosity of the cooler stack.

For the numerical optimization, we have used the linier thermoacoustic theory proposed by Rott. In this calculation, the momentum and continuity equations in the Rott's theory were modified into the transfer matrices. The used transfer matrices were validated using the experimental results. It was found that the transfer matrices used for the calculation has a good agreement with the experimental results. Then, we used the transfer matrices to calculate the performance of Yazaki's cooler. It was found that the optimum relative position, radius of the engine stack, radius of the cooler stack, porosity of the engine and porosity of the cooler are 0.54, 0.96, 1.06 and 1.3, respectively. In addition, it was found that the numerical optimization of the parameters makes the whole cooler system to be 0.24 of the upper limit value.

KEYNOTE SPEAKER 7

Assoc. Prof. Dr Nor Azman Ismail
School of Computing, Faculty of Engineering,
Universiti Teknologi Malaysia (UTM)

Dr Nor Azman Ismail is Associate Professor of Human-Computer Interaction (HCI) and Associate Chair (Research and Academic Staff) at School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia (UTM), Johor Bahru. For the past 25 years, Nor Azman has been an active member of the computing research community. He obtained his Bachelor of Science in Computer Science & Education (Mathematics) from Universiti Teknologi Malaysia (UTM) (1995) and subsequently receiving Master of Information Technology from Universiti Kebangsaan Malaysia (UKM) (2000). In 2007, he was awarded a PhD in the field of Human-Computer Interaction from Loughborough University, United Kingdom. He has produced various scientific research publications, as well as supervising over 100 students undergraduate and postgraduate. He has held several senior leadership positions including University Web Director and

Deputy Director of Corporate Affairs (2009 – 2018); Head of UTM VicubeLab Research Group working in the design, implementation and application of visual computing and virtual environment (2018); Research Fellow (2009 – 2018) of Media and Game Innovation Centre of Excellence (MaGIC-X), UTM-IRDA Digital Media Centre. He has received various international awards and honours including Al-Khawarizmi Innovation Award by Universiti Sains Islam Malaysia (USIM) in 2016 and Webometrics award by Faculty of Computing, Universiti Teknologi Malaysia (UTM) for two consecutive years (2015-2016). Most of his research projects and industry collaboration are focused on the domain of Multimodal Interaction, UI/UX experiment, Image Retrieval, Social Media Analytics and Web Mining.

Title: Online Social Community of Elderly People: What It Should Be Designed?

Abstract. Ageing of the population is now a global problem and often connects with social media. The elderly people population has significantly exploded, and their mental and physical fitness must be a priority worldwide. Social networks are used as a valuable tool to assist senior citizens. Hence, knowing how the older communicate with social media and the potential benefits and risks in this interaction is essential. Elderly peoples without or with minimal computer abilities are at risks of social isolations as social circle shifts onto the Internet. Therefore, online social integration through communication with family and friends can fulfil human's desires of being cherished and respected. Such communications are essential for elderly people, especially for those who have retired. Online social communities can help with this and provide a positive effect on elderly people. But the elderly are quite reluctant to work with new technologies. Although the

researchers have tried to implement specially designed social media applications in easy user-interface devices for the elderly, this helped in widening the digital divide for the elderly because these designs do not meet the aspirations of the elderly. Numerous frameworks are relevant to the ageing, which should be taken into consideration while building a social community of elderly people. A framework for ageing in place safely and acknowledge the importance of multiple factors have been conceptualized which include the biological and psychological characteristics of the individual, the network of social support, legal services, the need for medical services, and the structure of the home and neighbourhood. These and other frameworks recognize that ageing in place strategies must consider not only the personal (micro) environment, including housing but also the community and structural components as well. This paper highlights a brief introduction and review of previous researches to provide basic knowledge involved in the design and development of a social support community application and system for elderly people from numerous frameworks.

Part IV

INVITED SPEAKER 1

Dr. MOHD AZLAN BIN SUHAIMI
Universiti Teknologi Malaysia (UTM), MALAYSIA

Mohd Azlan Bin Suhaimi is a senior lecturer in the School of Mechanical Engineering at UTM since 2009. He received his B.Eng. in Mechanical Engineering and Master's degree in Advanced Manufacturing Engineering from UTM. He received his Ph.D. in Engineering from Jeonbuk National University, South Korea. During his PhD, he was attached as a researcher in one of Korea renowned research center, KITECH. This center helps Korean SMEs solve their manufacturing problems. In 2016 he returned to Malaysia to serve his country. His research work is focus on machining process and additive manufacturing covering both polymer and metal printing. He has conducted various

training to vocational college, university students and related industries. Recently, during the MCO he was appointed as the head of School of Mechanical, emergency response team called UTMSHIELD, since then, his team provide several products and solutions to help the frontliner and local communities to fight against Covid-19 virus.

Title: Hybrid Cryogenic MQL for Improving Tool Life in Machining of Compacted Graphite Iron

Abstract. Compacted Graphite Iron, (CGI) is a type of cast iron which has outstanding mechanical strength and weight-to-strength ratio comparing to conventional gray cast iron (CI). The outstanding characteristics of CGI due to its graphite particle shape come from vermicular particle and compactness. The graphite is interconnected with random orientation and round edges, which results in higher mechanical strength. Whereas, graphite in CI presents smooth-surfaced flakes that easily propagate cracks, bringing weaker and brittle properties compared to CGI. Owing to the improved properties, CGI is a best candidate material to substitute gray cast iron that has been used in engine block castings for diesel engine. This is because CGI-based engines are able to operate under higher temperature and cylinder pressure with increased fuel consumptions, but produce lower levels of emissions. However, the implementation of CGI is still limited due to poor machining performance at high cutting speed. Further, tool life is decreased by about the factor of 20 percent when changed to CGI from CI under the same cutting condition. Thus, in this study, the effect of cryogenic cooling with minimum quantity lubrication (MQL) while high-speed machining of CGI (grade 450) is addressed. The machining test with cutting-speed of 700 mm/min, feed-rate 4,178 m/min, axial depth and radial depth-of-cut of 2.0 mm and 5.0 mm, respectively, was performed using uncoated carbide tools. Two different tool monitoring methods are used to monitor the cutting tool performance, which are the cutting

force and machining sound pressure. A piezoelectric dynamometer composed of a 3-axis dynamometer (Kistler 9265B), a multi-channel charge amplifier (Kistler 5070) and a DAQ (Kistler 5697A) were installed to acquire cutting force data. Whereas, to acquire sound pressure, a microphone (GRAS 46AE) was installed inside a milling machine nearby cutting zone. A custom-made tool condition monitoring algorithm was developed using NI-Labview® software for data acquisition. The analyzed data are then used for evaluation with respective tool wear evolution. The results show that, the combination of cryogenic cooling with MQL has outperformed other cooling/lubrication methods by consuming less cutting force and producing less sound pressure. In addition, the combination method has improved the tool life by 26% compared to the conventional flood coolant method.

INVITED SPEAKER 2

Prof Madya Dr HARITH BIN AMLUS
Universiti Malaysia Perlis (UniMAP), Malaysia

Mohammad Harith Bin Amlus obtained his Manufacturing degree, BEng, from Malaysian Technical University of Malaysia, Master of Science (Technology Management) from Northern University of Malaysia and PhD in Technology Management and Logistic. He is a Technology Management Expert in Faculty of Applied and Human Sciences, Universiti Malaysia Perlis. He is from Engineering background and undergone various training in manufacturing industries and start refining the Engineering Enterpreneurship programme in UniMAP. He started as a Program Chairman for a Postgraduate Studies, continue as a Program Chairman for Undergraduate (Engineering Entrepreneurship Programme) and become Acting Deputy Dean (Academic and Research). He is currently a Deputy Dean (Academic) and Research Fellow for SERC (Sport Engineering Research Centre). He lead the Sport Engineering Management Research and

focusing on the Performance of Malaysian athletes. He is a member of Board Engineering Malaysia, The Institution of Engineer, Malaysia and Malaysia Board of Technologists.

Title: Issues and challenging on Malaysia's TVET: A study on the industrial's prerequisites

Abstract. Human capital development is a critical factor in generating and sustaining Malaysia's economic growth. Malaysia dealing with the issues of unemployment among university graduates. By starting a skills training program, the government has trying to strengthen the skills of graduates so that they are able to get professional positions. However, there is lacking information on the right and appropriate assessment and evaluation of studies with respect to employability skills training programs local to help unemployed university graduates. This study is to identify the appearances of industries need of TVET in improving the best skills employability to the graduates in Malaysia. This research will use the statistical techniques and descriptive method and 255 questionnaires were distributed to the Malaysian Industries in Northern Region. Finally, the results of the study have policy implications where it can help for the development of effective strategies in improving the efficiency of TVET programs. The importance of this study will be able to provide specific policy guidelines for policy implications for strategy development.

INVITED SPEAKER 3

Dr KHAIRUL ANUWAR WAHID
Mechanical Engineering Unit, (UniKL-MFI)

Senior lecturer, Mechanical Engineering Unit, Universiti kuala lumpur kampus cawangan malaysia france institute. 3 years' experience as a Project Engineer. More than 6 years of experience as research engineer in R&D Institute. 4 years' experience as a Lecturer. Main and co-author of more than 40 papers with 148 citations, 5-h-index and 4-i10-index. Main and co-inventor of more than 20 filed IP in MyIPO. Lead and involve in high-level scientific research in microelectromechanical system (MEMS)/ nanoelectromechanical system (NEMS) and materials science & engineering. Expert in advance nanomaterial, sensor, electronic, programming, data analysis, physical and mathematical modelling. A highly dedicated scholar with strong determination and strategic approach to problem solving. Highly capable to demonstrate and train new employees with a vast range of transferable skills for high-end nanotechnology-based equipment operations and simulation tools. Resourceful and versatile with

excellent interpersonal skills, highly developed work ethic and reputation for integrity.

Title: How UniKL embrace the TVET challenges

Abstract. Technical and Vocational Education and Training (TVET) will play a pivotal role in providing the skilled workforce required for Malaysia's economic transformation and the next stage of the country growth. It is the pathway of the 21st century, the way forward to close gaps between economies of the globe, and vital to meet the demands of a technologically complex and unique future. However, recent feedback showed a gap between supply and demand as the industry complains that training providers do not provide adequate skill and knowledge to run the operation. In the meantime, the training providers complains the industry do not employ their graduates or pay them under average salary. The decreasing of student intake related to TVET courses also significantly affect the TVET future. In this sharing, the researchers would like to share how UniKL identify the main course of the problem and take the initiative to achieve the TVET vision by proposing higher-TVET via engineering programs.

INVITED SPEAKER 4

Dr NOR HASRUL AKHMAL NGADIMAN
Mechanical Engineering Unit, (UniKL-MFI)

Nor Hasrul Akhmal Ngadiman received his Bachelor of Engineering in Mechanical Engineering (Industry) degree from Universiti Teknologi Malaysia (UTM) in 2012. Based on his excellent achievement in academic and extra-curricular activities, he was offered the opportunity to pursue his Doctor of Philosophy (PhD) degree directly after his first degree via UTM's Fast Track Programme. He embraced the challenge, and with diligence and perseverance he obtained his PhD in Mechanical Engineering from UTM in 2016. He is currently Senior Lecturer in the Department of Materials, Manufacturing and Industrial Engineering, School of Mechanical Engineering, Faculty of Engineering (FE), UTM, Johor Bahru, Johor, Malaysia. He is a member of Institution of Mechanical Engineers and Chartered Mechanical Engineer. He is also Professional Engineer recognized by Board of Engineer Malaysia and Professional Technologist recognized by Malaysia Board of Technologist. Dr. Hasrul is involved (both as Project Leader and Project Member) in numerous research projects funded

by the Ministry of Education and various industries as well as by the UTM. His papers have been published in both international and national journals. In addition to this, he has presented papers at international and national conferences and seminars. He has won several international and national recognition such as best paper award, best presenter award and best invention award. He has obtained over 208 citations and H - index 7 in Scopus. Dr. Hasrul is engaged with several consultancy projects involving local companies and organizations and has conducted training on diverse courses organized by the university as well as industry.

Title: Android Based Application for Hazard Identification, Risk Assessment and Risk Control (HIRARC) System

Abstract. Along with the rapid development, smartphone functionality is getting more important to us as it can bring convenience to the public. As we are in the middle of digitization, mobile applications have now become crucial to replace conventional manual way. The purpose of this study is to develop a functional Android Based Application for HIRARC System and evaluate its effectiveness in solving the problems. It is one of the element in Industry Revolution 4.0, which digitalize the slow and inefficient manual paper-based system with a mobile application. There are several problems identified in the current state of HIRARC process and procedure due to improper managing control and caused low efficiency in overall performance. Misplaced the HIRARC documents caused missing issues happened and it is time-consuming to look for the missing documents. Besides, referring to the printed hardcopy of HIRARC documents is slow and inefficient. This process can be improved by digitalized all the HIRARC information and stored into a database to help users retrieve HIRARC data quickly and easily by scanning QR code. The concept of prototype HIRARC System was proposed and successfully developed. The evaluation method is using qualitative analysis which is collecting user's experience

by distributing the survey questionnaire. The result in the qualitative analysis shows the positive result of the experience of the HIRARC System from users. The results proved that this android based application for HIRARC System has a great potential to improve the current HIRARC process and procedure.

Part V
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Part VI

General Information

About UniMAP

Universiti Malaysia Perlis (UniMAP) is Malaysia's 17th public institution of higher learning. Approved by the Malaysian Cabinet in May 2001, it started off as a university college - Kolej Universiti Kejuruteraan Utara Malaysia (KUKUM). The institution's first intake comprised 116 engineering students who began classes in June 2002. In February 2007, KUKUM was upgraded to a full-fledged university and renamed Universiti Malaysia Perlis (UniMAP). The university is one of only four technical universities in Malaysia.

UniMAP's raison d'etre was to produce highly-skilled engineers to fulfil and support Malaysia's Industrial Blueprint (Pelan Induk Perindustrian Negara). Over the years, we have remained true to this mission, aiming to produce exemplary individuals who will contribute to the Nation's development and industry competitiveness agenda.

About UTM

Since its establishment as a technical school in 1904 and finally a full-fledged university in 1972, UTM has played a pivotal role over the years as the nation's largest contributor of technical and professional workforce for the local industry, government agencies as well as multinational companies. UTM has two campuses; one is located in the heart of Kuala Lumpur, known as the UTM Kuala Lumpur Campus. The other, which is its main campus, is situated in a strategic location in the Iskandar Malaysia region, a vibrant economic corridor in Johor, the south of Peninsular Malaysia.

Along with its established vision to be recognised as a world-class Entrepreneurial Research University, UTM is set to be the centre of academic and technological excellence. Its mission is to be a leader in the development of human capital and innovative technologies that will contribute to the nation's wealth creation. UTM is now regarded as Malaysia's premier institution in engineering, science and technology and is ranked in the top 100 league in the World University Rankings in the field of engineering and technology.

UTM's vision is therefore in line with the aspiration of the nation towards becoming a knowledge-based, innovation-led economy grounded in creativity and innovation with high value creation. The differentiation strategy for the university is the concept of "New Academia", which is an attempt at embracing fresh dimensions in a knowledge culture beyond the conventional academia paradigm. It is an integrated model of knowledge advancement that moves across disciplines and beyond boundaries. Knowledge acquisition, application and dissemination happen in a more dynamic, vibrant and enriching way based on practicality, meaningful engagement, smart partnership and relevant exposure. The "New Academia" aims to make higher education more efficient and integrated into socio-economic development. To make this a reality requires good governance, steady funding source and entrepreneurial spirit.

Innovation is also central to UTM's core values. A culture of innovation permeates across all dimensions of the university including teaching and learning, research and development, writing and publication, management and administration, staff and student development, consultancy and professional services and also university social responsibility. Innovation is expedited by the university community through concerted efforts and a strong team spirit with shared values and purpose.

Since becoming a research university, UTM is committed to becoming a graduate-focused university; more innovative research-based postgraduate programmes are offered and more attractive and varied modes of PhD programmes implemented, such as PhD by Publication, Industry-based Doctoral Degrees, PhD by Fast Track and Double/Dual Doctoral Degrees. This not only provides flexibility in postgraduate study approaches, but at the same time contributes to increased publications and citations,

while enhancing technological development and a value-driven economy.

Through a strategic transformation of its organisational structure, UTM is focused on creating a vibrant knowledge culture and fertile intellectual ecosystem that inspire creativity, innovation and entrepreneurial mindsets. This is also in tandem with the transformation plan of the Ministry of Higher Education to turn Malaysia into an educational hub renowned for high quality educational standards and research excellence in strategic key areas of knowledge and specialised disciplines as well as multi-disciplinary fields.

CENTER OF EXCELLENCE GEOPOLYMER & GREEN TECHNOLOGY (CEGeoGTech)

ABOUT CEGeoGTech

CEGeoGTech located at the School of Materials Engineering, Kompleks Pusat Pengajian Jejawi 2, Taman Muhibbah, 02600 Arau, Perlis. CEGeoGTech has been established on July 2011 with the intention to induce innovation in green material technology among researchers in Universiti Malaysia Perlis. CEGeoGTech are able combining their expertise and skills in various fields to support the academic structure in the generation of human capital that contributes to the development of high quality research. This center also can become a pillar of academic activities, especially regarding research, development and innovation.

CEGeoGTech have **NINE (9)** fields of research includes:

- Geopolymer
- Polymer Advanced
- Electronic Packaging Materials
- Green Ceramic
- Electrochemistry of Green Materials
- Green Environment
- Green Manufacturing and Design
- Materials in Nanotechnology
- Green Materials for Electronic Applications

VISION, MISION AND OBJECTIVE OF CEGeoGTech

Vision

To be among the world's best in green technology towards achieving UniMAP as an academic institution that contribute to the development of high quality research.

Mission

Develop environmental friendly product using natural polymeric materials.

Objective

- Research activities are implemented together to develop technology-related innovation cycle of the green materials especially in green technology.
- Research and development of green technology into advance international stage.

Applied Industrial Analytics Research Group

ABOUT Applied Industrial Analytics

The Applied Industrial Analytics Research Group is created to serve as a platform for collaboration between industry and researchers from higher education institution. Our mission is to foster collaboration by embracing industry driven research culture, provide innovative and creative solution utilizing current technology in analytics that suit industrial needs.

Research Area

Modeling
Optimization
Simulation
Industrial Analytics
Ai-Softcomputing

Mission:

1. To foster collaboration by embracing industry driven research culture
2. Provide innovative and creative solution utilizing current technology in analytics that suit industrial needs.

PART VII

List of Abstract and Participation

(1)
INTERNATIONAL CONFERENCE ON GREEN ENGINEERING & TECHNOLOGY 2021
(IConGETech 2021)

(2)
INTERNATIONAL CONFERENCE ON APPLIED COMPUTING 2021
(ICAC 2021)

&

(3)
INTERNATIONAL CONFERENCE ON TECHNICAL AND VOCATIONAL EDUCATION & TRAINING
(IconTVET 2021)

Competencies of Quantity Surveyors in Construction Industry – A Review

*Siti Nur Aishah Mohd Noor[1,2] and Siti Uzairiah Mohd Tobi[1]

[1] Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia (UTM), Jalan Sultan Yahya Petra, Kuala Lumpur, Malaysia.
[2] Department of Quantity Surveying, Universiti Teknologi MARA, Cawangan Perak, Kampus Seri Iskandar, Perak, Malaysia.

*sitinuraishahmn@gmail.com

Abstract. Competency has been defined in many different ways from different perspectives since its establishment. It can be referred to organizationally or individually. This research area has increasingly attracted researchers during the past few years. Currently, reviews in the literature on Quantity Surveyors (QS) competency are lacking. Therefore, considering the contribution by recent studies, a comprehensive review is attempted. This paper aims to provide an in-depth review of the literature on QS competency from both local and global perspectives. Within this study, the authors have reviewed the competency literature in a way that would help other researchers, academicians and professional bodies to have a closer look at the growth and development of QS competency. The authors examined various research papers, and on this basis, propose new competency elements for QS profession in the subsequent phase of the research process. In addition, certain gaps that would provide hints for further research in QS competency were identifieds.

Conceptual Analysis on Single Buyer Market Model and Pool Market Model in Deregulated Electricity Market

Norain Sahari[1], *Zuraidah Ngadiron[2], Dalila Misman[1], Aida Mazri[1]

[1]Power Energy Focus Group, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja , Batu Pahat, Johor, Malaysia.
[2]Industry Centre of Excellence for Railway, Institute Integrated Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja , Batu Pahat, Johor, Malaysia.

*zuraidahn@uthm.edu.my

Abstract. In Malaysia, Tenaga Malaysia Berhad (TNB) is the largest and leader of the electricity market that transmits and distributes power systems. As the largest shareholder in the energy market, TNB has partnered with the government to ensure a universal supply of electricity to all of Malaysia while supporting renewable energy to safeguard supply. On 29 September 1992, Malaysia has suffered a prolonged power outage caused by a thunderstorm that disrupted transmission facilities and caused the failure of transmission and distribution of power systems. Thus, since 2005 Malaysia Electricity Supply Industry (MESI) planned to shift its structure to a wholesale market model in 2005. Initially, the government introduced Independent Power Producers (IPPs), and since then, MESI has applied to a single buyer market model that continues till now. However, this model cannot approach competition as it is supposed to. Therefore, this thesis presents an analysis of a single buyer market. The pool market model analyzed electricity competition between the Single Buyer Market model and the Pool Market model. The purpose of the research done to investigate structure and economics aspects of market models, comparing the demand payment, and analyze the pros and cons between the Single Buyer Market Model, Pool Market Model, and Spot Market Model.

Integration and Characterization of Aluminium-Sputtered Zinc Oxide Nanocomposite: a Potential Hybrid Nanomaterial

Hussaini Adam[1], *Subash C.B Gopinath[2], M.N.A. Uda[2] and Uda Hashim[1]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis 01000 Kangar, Perlis, Malaysia.
[2]Faculty of Chemical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

*subash@unimap.edu.my

Abstract. Development of hybrid nanostructures has been demonstrated as a potential approach for achieving high-performance sensing devices. At this juncture, Aluminium-Sputtered Zinc Oxide nanocomposites were grown on silicon wafer and their impacts on physical and electrical characteristics were studied. Structural patterns displayed that ZnO crystal lattice is in preferred c-axis orientation and proved the higher purity. Examinations under scanning electron microscopy revealed the pattern of ZnO nanocomposites. Gap size and finger electrode sizes were measured using higher power microscope and scanning electron microscope. From the image of high-power microscope of bare aluminium interdigitated electrode, the gap size was measured to be 163.37 µm and finger electrode size was measured to be 346.34 µm. Likewise, atomic force microscope was also used for surface roughness measurement of the fabricated aluminium interdigitated electrode. Further, current-voltage analysis of Al-sputtered ZnO nanocomposites was carried out in the voltage range of 2V with applied currents for electrolytic evaluation of the fabricated device. The achieved results indicated significant changes in the electrical properties with nanostructures. It is a clear demonstration that Al-sputtering was obvious to be ideal as a potential nanomaterial.

Integration of aluminium interdigitated electrodes with zinc oxide as nanocomposite for selectively detect alpha-synuclein for Parkinson's disease diagnosis

Hussaini Adam[1], *Subash C.B Gopinath[2], M.N.A. Uda[2] and Uda Hashim[1]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis 01000 Kangar, Perlis, Malaysia.
[2]Faculty of Chemical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

*subash@unimap.edu.my

Abstract. Parkinson's disease is associated with motor and non-motor symptoms, mostly a motor symptom such as tremor is said to be an early indication for Parkinson's disease development. Therefore, this study come-up with an alternative way of identifying a specific biomarker for early detection of Parkinson's disease, such as abnormal accumulation of alpha synuclein in the brain. Finding the inconsistent aggregation of alpha-synuclein is a promising method for the early detection of Parkinson's disease. In this study, aluminium interdigitated electrodes (ALIDEs) have been fabricated and employed with sensitive electrochemical strategy for the specific detection of the Parkinson's disease antigen (alpha synuclein). The microelectrode was developed based on aluminum electrode sputtered on silicon substrate. Further, zinc oxide (ZnO) was deposited by sputtering on the working electrode of the ALIDEs using a spin-coating method. The ZnO nanocomposite onto aluminum microelectrode surface provides a favorable platform for efficient loading of antibody via binding with antigen alpha synuclein. The effective loading of the biomolecules (antibody and antigen) on the ZnO nanocomposite surface modified aluminium microelectrode was observed by SEM, AFM and 3D Profilometer. The current flows were observed at 7×10−5 A, 1×10−4 A, and 1.2×10−4 A for different concentrations of alpha synuclein for Parkinson's disease.

Microfluidic based Dielectrophoretic Cell Sorter for Real-time Cancer Detection

Syed Salman Rahman[1] and *Mohd Ridzuan Ahmad[1]

[1]School of Electrical Engineering, Universiti Teknologi Malaysia, 81310 Skudai, Johor Bahru, Malaysia.

*mdridzuan@utm.my

Abstract. Cancer is known to be the second leading cause of human death worldwide. The death due to cancer is significantly huge mainly due to late diagnosis and detection of cancer. The traditional methods used for detection come with significant drawbacks and share similar disadvantages like long time consumption to give a result to detect the stages of cancer. Microfluidic based Dielectrophoresis (DEP) is a label-free, non-invasive method used for biological cell sorting by many researchers. This method is concisely utilized in the segregation of cancerous cells from normal, healthy cells which can help in the diagnosis in real-time. In this paper, two variations of designs of the chip are proposed. With the aid of dielectrophoretic field-flow-fractionation (DEP-FFF) using a low voltage of 10 Volts, the device was successful in separating a total of 48 samples of Circulating Tumor Cells (CTCs) from a total mixture sample of 52, at a rate of 87% in 118 seconds. The complete study was simulated on COMSOL Multiphysics 5.3A through which the comparison study on characterization of the designs in terms of electric potential, pressure, fluid flow of the particles and separation was carried out..

Electrical and Topography Analysis of 50 µM Gap Aluminium Based Interdigitated Electrode

*M.N. Afnan Uda[1], U. Hashim1, M.N.A. UDA[2] and Tijjani Adam[3]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia.
[2]Faculty of Chemical Engineering, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia.
[3]Faculty of Technology, Universiti Malaysia Perlis, Kampus Uniciti Alam Sg. Chuchuh, 02100 Padang Besar (U), Perlis, Malaysia.

*nurafnan92@yahoo.com

Abstract. The aim of this research study is to study the electrical and topography analysis of fabricated Aluminium Interdigitated Electrode (Al IDE). Al IDE pattern was designed using AutoCAD software with 50 µM finger gap. Fabricated electrode was physically characterized using High Power Microscope (HPM), Scanning Electron Microscope (SEM) and electrically validated through I-V measurement using Current Source Meter (Keithley 2450) and sensor platform. Electrical measurement confirmed that Al IDE was well fabricated without any shortage and results of similar Al IDE samples were confirmed that the repeatability of the device.

Sixth order Adams Bashforth-Moulton block method for solving constant and time-dependent neutral delay differential equations

*Sakinah Mohamad Puzi[1] and Nurul Huda Abdul Aziz[1]

[1]Institute of Engineering Mathematics, Faculty of Applied Sciences and Humanities, Kampus Pauh Putra, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia.

*hudaaziz@unimap.edu.my

Abstract. This paper presents the numerical solution of sixth order Adams Bashforth-Moulton block method for solving neutral delay differential equations (NDDE) with the type of constant and time-dependent delay. There are two techniques that has been implemented in approximating the neutral delay term, . First, at the starting point of the multistep block method, the neutral delay is approximated by using initial function or extrapolation. Meanwhile, in the block method itself seven points of stored values has been used to approximate this term using Newton divided difference interpolation with the variable step size strategy. Some of the mathematical problems has been tested and implemented using Visual C programming. Numerical results show that the proposed method is reliable and efficient when compared with the other methods.

Temperature Analysis of Bus Bar by Material Variation under Non-Linear Load Operation

*M.H.A. Aziz[1], M.M. Azizan[2], Z. Sauli[1], M.W. Yahya[2] and W.M.W. Norhaimi[1]

[1]Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia.
[2]Faculty of Electrical Engineering Technology, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia.

*muhamadhafiz@unimap.edu.my

Abstract. Busbars are generally used to transmit and distribute current to a distribution board in buildings. The existence of harmonic current has been known to increase heat generation in the bus duct system. The heat generation commonly causes power losses at the conductor. In this study, a three dimensional (3D) Finite Element Method (FEM) by COMSOL Multiphysics software was utilized for predicting the heat distribution and average temperature for each material and their compliance with BS159:1992 Standard. The dimension of the busbar in this work is 1.5" × 0.125" × 20". Current source begins from 410 A and varies from 0% until 50% of Total Harmonic Distortion (THD) with an interval of 5%. The results depict that the temperature varies between each material. Silver demonstrates the lowest operating temperature at an ideal current (0% THDi), and minimum temperature rise after the existence of harmonic component in the current source and iron depicts otherwise result. In Overall, copper proved to be the best material for busbar due to the reasonable price; the low operating temperature at ideal current; and less increment of temperature after the presence of harmonics in the current source.

Optimization of Ultrasonic-Assisted Enzymatic Extraction of Tannic Acid from Chromolaena Odorota sp.

AAA Kamal[1], *M Mohamad[1], KA Sulaiman[1], NA Mohidem[2], NF Shoparwe[1], PT Teo[1], MN Masri[1] and AH Yusoff[1]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.
[2]Advance Materials and Process Engineering (AMPEN) Laboratory, Faculty of Chemical Engineering, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia.

*mardawani.m@umk.edu.my

Abstract. A study was conducted by applying ultrasound-assisted enzymatic extraction (UAEE) to Chromolaena odorota to extract tannic acid as one of the phenolic compounds in the plant, undergo extraction with parameters which includes enzyme concentration, sonication time and duty cycle at constant temperature of 50°C, solid to liquid ratio of 1:10 and sonication power at 60% amplitude. The optimum extraction process was found at cellulase enzyme concentration of 4%, sonication time of 60 minutes and duty cycle of 50% with the obtained concentration of tannic acid at 1.6152 mg/mL. The study shows that the UAEE could be employed to enhance yield of tannic acid, reduce the extraction time and ensuring green extraction method were applied in the study.

Simulation of energy saving potential in the university building using AC scheduling techniques

Norasikin Hussin[1], *Azli Abd Razak[2] and Faizal Baharum[3]

[1]Faculty of Mechanical Engineering, Universiti Teknologi MARA Cawangan Pulau Pinang, Kampus Permatang Pauh, 13500 Permatang Pauh, Pulau Pinang, Malaysia.
[2]Faculty of Mechanical Engineering, Universiti Teknologi MARA Shah Alam, 40450 Shah Alam, Selangor, Malaysia.
[3]School of Building, Housing and Planning, Universiti Sains Malaysia, 11800 Pulau Pinang, Malaysia.

*norasikin245@ppinang.uitm.edu.my

Abstract. By the year 2030, the energy consumption is expected to increase to 50 % [1] and university building consume 40% of total energy consumption comes from HVAC system [2]. Thus, energy consumption in university building can be minimized if energy saving technique is applied. In this paper, the aim of this study is to estimate the potential energy saving through the AC scheduling technique. Energy saving were explored by IES VE software for library in Permatang Pauh campus. The results indicate that the Ac schedule technique have the most significant impact on the potential energy saving. The rescheduling of AC operation is divided into for methods. The simulation results show that the annual energy consumption is 31040.22MWh and potential energy saving is about 34% without sacrificing the thermal comfort of the occupants. The Method (D) is best technique to achieve energy saving in library building.

Analysis on Inlet Nozzle Design Geometry of Tesla Turbine

Sufi Halim[1], *Md Tasyrif Abdul Rahman[1], Anas Abdul Rahman[1], Nasrul Amri Mohd Amin[1], Nur Shuhaila Roslan[1] and M. Fathullah[1,2]

[1]Faculty of Mechanical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.
[2]Green Design and Manufacture Research Group, Geopolymer & Green Technology, Centre of Excellence (CEGeoGTech), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.

*tasyrif@unimap.edu.my

Abstract. Tesla turbine is a bladeless turbine that uses a set of discs arranged at a certain distance to rotate and one of the parameters controlling turbine performance is the inlet parameter. The purpose of this study is to optimize the design of the inlet nozzle and analyze its effects on the flow of the fluid. A total of four nozzle designs have been proposed using CATIA while the Solidworks Flow Simulator is used to analyze the fluid flow at various inlet velocities. Then, the most efficient design is then fabricated via 3D printing and put to test by connecting it with the actual Tesla turbine model. Through the results obtained from the analysis, it is observed that Design 4 is the most efficient of all tested nozzles and no changes occur between the outlet and the inlet in Design 1 and 2. However, there is a significant difference that occurs in Design 3 and 4. After fabricating it, the highest RPM and output voltage achieved due to the nozzle is 7940 RPM and 13.56 V. The difference in velocity and pressure increases as the area of the nozzle outlet reduces, whereas nozzle efficiency decreases as the inlet velocity increases.

Effect of Graphene Nanoplatelets on Water Absorption Properties of Coconut Shell reinforced Unsaturated Polyester Composites

A. Abdullah, *M.B. Abu Bakar, S.H. Mohd, M.N. Masri, A. Hermawan and A.S. Sharizal

Advanced Materials Research Cluster, Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan Malaysia.

*bashree.ab@umk.edu.my

Abstract. Coconut shell (CS) reinforced unsaturated polyester (UPE) composites have been prepared by using hand lay-up and compression molding technique. To improve fiber matrix adhesion, the CS was chemically treated by two chemical treatments which are alkaline (NaOH) and alkaline-silane with concentration NaOH (6%) and silane (2%). To enhance the performance of CS-UPE composites, graphene nano platelets (GNP) was also added as nano filler. The water absorption tests were conducted in order to characterize the physical properties of the composites. The result shows that, water absorption increases with the increasing GNP. The more adding of the weight percentages of GNP fillers, the higher of water absorption will be getting.

Exploring Pupil Position as an Eye-tracking Feature for Four-class Emotion Classification in VR

Jia Zheng Lim[1], James Mountstephens[2] and *Jason Teo[3]

[1]Gradaute Researcher, Evolutionary Computing Laboratory, Faculty of Computing and Informatics, Universiti Malaysia Sabah, Jalan UMS, 88400, Kota Kinabalu, Sabah, Malaysia.
[2]Senior Lecturer, Faculty of Computing and Informatics, Universiti Malaysia Sabah, Jalan UMS, 88400, Kota Kinabalu, Sabah, Malaysia.
[3]Professor, Faculty of Computing and Informatics, Universiti Malaysia Sabah, Jalan UMS, 88400, Kota Kinabalu, Sabah, Malaysia.

*jtwteo@ums.edu.my

Abstract. This paper presented a preliminary investigation of a novel approach on emotion recognition using pupil position in Virtual Reality (VR). A total of ten subjects participated in this emotional experiment. A 3600 video with four sessions of stimulation of emotions will be presented in VR to evoke the user's emotions. The eye data were recorded and collected using Pupil Labs eye-tracker and the emotion classification was done by using pupil position solely. The classifier used in this investigation is the Support Vector Machine (SVM) machine learning algorithm. The results showed that the best accuracy achieved from this four-class random classification was 59.19%.

Extraction of Tannic Acid from Kenaf Bast Fibre using Ultrasonic Assisted Extraction

*M Mohamad[1], HA Ibrahim[1], MFM Nasir[2], NA Mohidem[3], NF Shoparwe[1], PT Teo[1] and MN Masri[1]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.
[2]National Kenaf and Tobacco Board, Kubang Kerian, 16150 Kota Bharu, Kelantan, Malaysia.
[3]Advance Materials and Process Engineering (AMPEN) Laboratory, Faculty of Chemical Engineering, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia.

*mardawani.m@umk.edu.my

Abstract. This study is aimed to study the optimum extraction process parameters namely, sonication time and duty cycle for the extraction of tannic acid using Ultrasonic Assisted Extraction (UAE). The extracts then were analysed using High-Performance Liquid Chromatography (HPLC) and Scanning Electron Microscopy (SEM). Apart from that, the phytochemical screening was conducted for the presence of tannic acid based on the observation of orange colour obtained. The optimum parameters obtained for the extraction of tannic acid are sonication time of 20 minutes and duty cycle of 50% at concentration of 0.2429 mg/mL. From SEM analysis, it was found that the pure sample demonstrated rough surface and no porous but kenaf bast fibre display smoother surface with less impurities and few pores appeared after the extraction process using UAE. The ultrasound-assisted extraction of kenaf bast fibre is an effective way of extraction method with the advantages of lower extraction time and higher extraction yield.

Flow characterisation in an exhaust manifold of a single-cylinder internal combustion engine (ICE)

Aziz N.A.[1], Rahman M.T.A.[1], *Amin N.A.M.[1], Bin Mohamad M.S.[1], Mohamad A.[1], Izham M.[2] and Saad M.A.M.[1]

[1]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Kampus Alam Pauh Putra, 02600 Arau, Perlis, Malaysia.
[2]Institute of Engineering Mathematic, Faculty of Applied Science and Humanities, Universiti Malaysia Perlis (UniMAP), Kampus Alam Pauh Putra, 02600 Arau, Perlis, Malaysia.

*nasrulamri.mohdamin@unimap.edu.my

Abstract. This paper presents an investigation of flow characteristic inside the exhaust manifold that were designed with different bending angle (BA), bending radius (BR) and pipe diameter (Dp). Five exhaust manifold models were developed and analysed by computational fluid dynamic (CFD) method. Accordingly, the pressure distribution, velocity streamline and backpressure values were observed. The simulation results showed a different flow pattern for all five models, indicating the manifold design affect the flow characteristic inside the exhaust system. The results demonstrated that the pressure distribution inside the exhaust manifold is influencing its velocity streamline pattern, that directly effecting the outlet velocity of the exhaust gas. From this work, a small bending angle with a short straight pipe has led to a smoother exhaust flow and even exhaust velocity across the model. The results obtained from the simulation can be used as guide to improve the understanding of the flow behaviour in the manifolds and might be used to improve the manifold design.

Influence of Outlets Port Design on The Tesla Turbine Performance

Sufi Halim[1], *Md Tasyrif Abdul Rahman[1], Anas Abdul Rahman[1], Muhammad Adi Hilmi Adnan[1], Muhammad Hafizi Azuzin[1] and Gisrina Elin Suhri[1] and M. Fathullah[1,2]

[1]Faculty of Mechanical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[2]Green Design and Manufacture Research Group, Geopolymer & Green Technology, Centre of Excellence (CEGeoGTech), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.

*tasyrif@unimap.edu.my

Abstract. The boundary layer turbine known as Tesla Turbine invented long ago but has failed to be commercialized and replaced by bladed turbines. In this paper, two new techniques for improving the turbine have been proposed. A test model of the proposed boundary layer turbine has been fabricated made and tested under different conditions. The design process includes producing a virtual design and simulation of the turbine using computer software. The proposed designs were fabricated and then tested to analyse results such as speed produced, power produced, and the turbine efficiency. From this study, the proposed turbine designs manage to achieve 18% and 69% efficiency.

Investigation of Single Fibre Tensile Properties of the Pineapple Leaf (PALF)

Muhammad Zuhair Mohd Rizal[1,2] and *Ahmad Hamdan[1,2,3]

[1] Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, Malaysia.
[2] Structural Integrity and Monitoring Research Group (SIMReG), Universiti Tun Hussein Onn Malaysia, Malaysia
[3] Center of Excellence Geopolymer & Green Technology (CeGeoGTech), Universiti Malaysia Perlis (UniMAP), 01000 Kangar, Perlis, Malaysia.

Abstract. Recently, natural fibres composite is rigorously explored as alternative fibres due to the source depletion of petroleum. This research was focusing on pineapple leaf (PALF). The purpose of this research was to study the single fibre tensile properties of PALF. The single fibre tensile test was conducted via the universal testing machine following ASTM D3379 – 89 standards. The result shows that the Ultimate Tensile Strength (UTS) and Young's Modulus of PALF were 141.093 MPa and 89.073 MPa, respectively.

Mechanical and Physical Properties of Cross-Laminated Timber Made from Batai using Different Glue Spread Amounts

*Kang Chiang Liew[1] and Ezzia Stecy Maining[1]

[1]Faculty Science of Natural Resources, Forestry Complex, Universiti Malaysia Sabah, Jalan UMS, 88400, Kota Kinabalu, Sabah, Malaysia.

*liewkc@ums.edu.my

Abstract. This study aimed to determine the mechanical and physical properties of the Cross-Laminated Timber (CLT) with different amounts of glue that usually used in the industry which might help in reducing the CLT manufacturing cost. Four different amounts of glue spread were used where the glue that used was phenol-resorcinol formaldehyde (PRF);150, 200, 250 and 300g/m2. The testing of the CLT was conducted by following BS EN 408:2010, BS EN 16351:2015, ASTM D 2718 method B, ASTM D 143-94 and Japanese Agricultural Standard (JAS) 1152:2007. The analysis of physical tests that have been carried out are density, moisture content, shrinkage and swelling of the CLT's thickness. Meanwhile, the mechanical tests were compression parallel and perpendicular to the grain, three-point bending test (flatwise and edgewise of CLT) and shear test. The highest density was shown by the CLT that using 300 g/m2 which the value was 316.41 kg/m3. Whereas the highest moisture content was shown by CLT that used 250 g/m2 with 15.49% in value. The highest thickness shrinkage percentage was 2.50%, CLT with 200g/m2 while the highest thickness swelling percentage was 5.60% which the CLT used 150 g/m2. For the flatwise bending test, it shows that the CLT that used 300 g/m2 has the highest MOE and MOR value which were 510.63N/mm2 and 8.39 N/mm2. The MOE and MOR value for edgewise bending also shows that CLT that used 300 g/m2 was the best with 1528.70 N/mm2and 13.48 N/mm2. In compression perpendicular to grain test, the CLT with150 g/m2 shows the highest value of MOE which was 5.89 N/mm2 while CLT that used 200 g/m2 has the highest value of compressive strength with 9.10N/mm2. However, for compression parallel to grain test, the CLT that used 300 g/m2 shows the best performance with 1002.78 N/mm2 and 13.75 N/mm2 of MOE and compressive strength value. Lastly, for the shear test, the highest shear strength value was 0.39 N/mm2 which belongs to CLT that used 150 g/m2. Thus, CLT that used 300 g/m2 of glue spread amount is the best CLT which, the more the amount of glue, the better the performance of the CLT.

Performance and Kinetic Study on Oil Removal via Electrocoagulation Treatment

Jillin So Ai Lam[1,2], *Noor Fazliani Shoparwe[2], Nurulbahiyah Ahmad Khairudin[1], Tan Lian See[1] and Lee Kee Quen[1]

[1]Malaysia - Japan International Institute of Technology, Universiti Teknologi Malaysia, 54100 Kuala Lumpur, Malaysia.
[2]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli Kelantan, Malaysia.

*fazliani.s@umk.edu.my

Abstract. Electrocoagulation (EC) is a reliable technology for wastewater treatment. It has been applied in treating various source of wastewater from tannery, electroplating, dairy, textile processing, oil and oil-in-emulsion. However, the performance of EC treatment for food wastewater still requires in depth studies. So in this study, a series of experiment has been conducted on the effect of the amount of additional sodium chloride (NaCl), applied voltage and pH to determine the efficiency of the EC treatment in oil removal. The EC treatment take place in room temperature and constantly agitated for 30 minutes meanwhile a sample will be collected for every 5 for UV –Vis analysis. The results obtained from the UV-Vis analysis will then be used to determine the concentration of the oil for kinetic model simulation. The results indicate that the EC treatment has the highest efficiency 89.26% with the additional of 7.5g of NaCl, voltage of 4V and at pH 6. In addition, the experimental results shows better curve fitness towards pseudo second order (PSO). Generally, EC treatment is a potential alternative as green technology wastewater treatment for oily food wastewater.

Impact of Internet of Things (IoT) Technology in Education

*Ghaliya Al Farsi[1,2], Azmi bin Mohd. Yusof[1], Ragad M Tawafak[2], Sohail Iqbal Malik[2], Mohammed Wassem Ishfaque[2] and Roy Mathew[2]

[1]Universiti Tenaga Nasional, College of Graduate Studies, Malaysia.
[2]Al Buraimi University College, Oman.

*galfarsi@buc.edu.om

Abstract. Within the coming a long time, innovation will affect the learning involved in numerous ways. Internet of Things (IoT) proceeds to confirm its vital position within the setting of Information and Communication Innovations and the improvement of society. With the support of IoT, teach can upgrade learning results by giving more princely learning experiences, made strides operational proficiency, and by picking up real-time, robust understanding into student execution. This consideration is to discover the potential of IoT in higher instruction and maximize its benefits and reduce the perils included with it. Further efforts are fundamental for discharging the total potential of IoT frameworks and innovations. The Internet of Things (IoT), which can respect as an improved adaptation of machine-to-machine communication innovation, was proposed to realize thing-to-thing communications cleverly by utilizing the Internet network. Therefore, this paper presents to think about approximately the effect of IoT on higher instruction, particularly universities. IoT stands to alter significantly the way colleges work and improve understudy learning in many disciplines and at any level. It has enormous potential for universities.

Removal of Ammonia Nitrogen and COD Using Waste Paper Sludge and Cockle Shell as an Alternative Composite Adsorbent for the Treatment of Landfill Leachate

*Yahaya Izat[1], Daud Zawawi[2], Ridzuan Mohd. Baharudin[2], Mat Daud Azra Munirah[2], Al Madhoun Wesam[2] and Rosli Mohd Arif[3]

[1]Centre for Diploma Studies, Universiti Tun Hussein Onn Malaysia.
[2]Advance Waste Recovery and Air Studies (AWRAS), Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia.
[3]Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia.

*yahizat@uthm.edu.my

Abstract. The potential of Waste paper sludge (WPS) and cockle shell (CS) as an alternative composite absorbent has been investigated to obtain the optimum mixing ratio in removing two working parameters such as ammonia nitrogen (NH3-N) and COD. Both WPS and CS were mixed together in different ratio. The absorption batch study includes the preparation of 5g composite adsorbent, 200 mL of raw leachate sample at pH 8.64, with a shaking speed of 200 rpm for 300 minutes at room temperature. The result shows, the optimum ratio obtained for composite mixture absorbent is (1:7) and the concentration capacity achieved for the ratio was 502 mg/L and 540 mg/L for NH3-N and COD. The percentage optimum removal is 50.20% NH3-N and 81.25% COD respectively. The optimum pH and absorbent dosage expressed the result at pH 7 and 50 g with the percentage optimum removal value is 50.10% NH3-N and 88.89% COD; and 503 mg/L NH3-N and 320 mg/L COD; and 51.98% NH3-N and 89.51% COD; and 484 mg/L NH3-N and 302 mg/L COD, respectively during the experiment.

Studies on Surface Plasmon Resonance of Murdannia loriformis Silver Nanoparticles

Nazatul Nabila Mohamad[1], Ainorkhilah Mahmood[2], Nor Aziyah Bakhari[2], Marlina Mohd Mydin[3], Norhafiza Mohd Arshad[4] and *Norain Isa[1]

[1]Faculty of Chemical Engineering, Universiti Teknologi MARA, Cawangan Pulau Pinang, 13500 Permatang Pauh, Pulau Pinang, Malaysia.
[2]Department of Applied Sciences, Universiti Teknologi MARA, Cawangan Pulau Pinang, 13500 Permatang Pauh, Pulau Pinang, Malaysia.
[3]Faculty of Health Sciences, Universiti Teknologi MARA, Cawangan Pulau Pinang Kampus Bertam, 13200 Kepala Batas,Pulau Pinang, Malaysia.
[4]Centre for Research in Biotechnology for Agriculture, Universiti Malaya, Jalan Profesor Diraja Ungku Aziz, 50603 Kuala Lumpur, Malaysia.

Abstract. In this work, surface plasmon resonance (SPR) was investigated over effect of concentration of metal precursor, concentration of reducing agent, reaction time and pH on the formation of silver nanoparticles (AgNPs) using biological method. In this method, Murdannia loriformis extract (MLE) was used as reducing agent and silver nitrate as metal precursor. SPR of synthesised Murdania loriformis silver nanoparticles (MLE-AgNPs) was measured through UV-vis spectrophotometer over a range of 380 – 800 nm wavelength. It was found that, as the concentration of MLE, pH and reaction time increases, the SPR peak of MLE-AgNPs at 430 - 490 nm also increases. However, for effect of concentration of metal precursor, the result showed that SPR peak of MLE-AgNPs increases when 1 to 5 mM of silver nitrate was used but decreases for 10 and 15 mM.

Effect of Carrier on the Fabricated of Polymer Inclusion Membrane: Characteristics and Kinetic Study

Nadia Aqilah Khalid[1], *Noor Fazliani Shoparwe[1], Rosmawani Mohammad[1], Mardawani Mohamad1and Muaz Zaini Makhtar[2]

[1]Faculty of Bioengineering and Technology, Jeli Campus, Universiti Malaysia Kelantan,17600 Jeli Kelantan, Malaysia.
[2]Bioprocess Technology Division, School of Industrial Technology, Universiti Sains Malaysia, 11800 Pulau Pinang, Malaysia.

*fazliani.s@umk.edu.my

Abstract. Vary composition of carrier in fabricated polymer inclusion membranes (PIMs) were applied for extraction of basic dye, methylene blue (MB) to achieve the optimal extraction efficiency (E%) among the fabricated membranes. The PIM is composed of poly(vinyl) chloride (PVC) as the base polymer, bis-(2-ethylhexyl) phosphate (B2EHP) as an extractanting agent and dioctyl phthalate (DOP) as the plasticizer. The fabricated PIMs were characterized by membrane porosity, contact angle (CA) and Fourier Transforms Infrared Spectroscopy (FTIR). Kinetic modelling was conducted to study the dye extraction process by using the pseudo-first-order and pseudo-second-order. It was found that the kinetic model shows highly significant of model fit with the kinetic data using pseudo-second-order. The addition of 30% B2EHP imparted the greatest enhancement on the features of PIMs and also accomplished great performance for extraction of methylene blue (> 99% of extraction).

Thermo-Mechanical Properties of Concrete Mortar with Hybrid Fibers for Energy Efficient Building

*Salmia Beddu[1], Amalina Basri[1], Zakaria Che Muda[1], Feras Abla[1], Daud Mohamad[1], Zarina Itam[1], Nur Liyana Mohd Kamal[1] and Teh Sabariah[2]

[1]Civil Engineering, Universiti Tenaga Nasional (UNITEN), Kajang, Malaysia.
[2]Institute of Tropical Biodiversity and Sustainable Development, Universiti Malaysia Terengganu (UMT), Kuala Terengganu, Malaysia.

*drsalmiabeddu@gmail.com

Abstract. Materials used in modern buildings have recently received increased attention from researchers and engineers due to their effect on climate change, energy usage and operating costs. The aim of this study is to evaluate the impact of PP fibre and KF added to the concrete mortar on its TC and to identify the correct combination of raw materials that preserve the mechanical properties and thermal-efficiency structure of building materials and, if possible, improve them. The results of the material properties tests showed that the addition of fibres normally contributed to a significant reduction in fresh mortar flow. As for compressive strength, the data for the series of mono fibres and the series of hybrid fibres showed an interesting contrast. It was also found that strength dropped slightly for all series of hybrid fibres. The use of fibres has enhanced tensile strength. The findings revealed that incorporation of fibres caused reduction in k value and yet, the impact of fibres on k was not considerable.

Characterization Copper Alloy Enhancement with Graphene via Powder Metallurgy

M Mohammad[1], M N Masri[1], M Yusoff[1], S Mamat[1], PT Teo[1]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli Kelantan, Malaysia

Abstract. In this study, the effect of milling speed and compaction pressure on the densification and morphology of CuZn-Gr composite was evaluated. The composite was prepared by using powder metallurgy technique. The effect of the microstructural and compaction were determined based on different milling speed in thus research. The different milling speeds that involved were 175 rpm, 200 rpm, 225 rpm, and 250 rpm. Meanwhile, the different compaction pressures that used in this study were 127.53, 250, 374.67, and 500 MPa. The properties of the milled powder gave the result to green density and densification parameter. The peak XRD of Cu and Zn broadened as milling time increased.

Dependence of Properties by Composition Modification in Polymer Inclusion Membranes

M N A Anuar[1], M N Masri[1], N F Shoparwe[1], M Mohamad[1]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli Kelantan, Malaysia

Abstract. These days, modification of polymer inclusion membranes (PIMs) has gotten much attention for diverse applications comparing to pure polymeric membranes. Regarding the alteration polymer blends, inclusion of nanoparticles filler and treatment techniques have been the primary research currently. However, this adjustment requires proper interaction understanding and the performance of materials utilized to set up the mixed matrix membrane before implementation in such essential applications. The membrane has a main drawback which is a lack of the long-term stability and strength. Thus, it is the uttermost important to increase the ability of the membrane by improving the properties.

Water Quality Monitoring and Controlling using IoT

*Mohamad, S.[1], Johar, H.L.[1], Shah, S.M.[1], Hanifa, R.M.[1,2] and Mahdzir, M. M.[3]

[1]Faculty of Electrical & Electronic Engineering, Universiti Tun Hussein Onn Malaysia, Batu Pahat, Johor, MALAYSIA
[2]Centre of Diploma Studies, Universiti Tun Hussein Onn Malaysia, Batu Pahat, Johor, MALAYSIA
[3]Faculty of Mechanical Engineering, Universiti Teknologi MARA, Penang Campus, Penang, MALAYSIA

Abstract. The water quality status of rivers in Malaysia has always been a cause for concern for various local authorities, government agencies, and the public. The issue is that the traditional method, such as workers, needs to go to each tank or river to collect data. The process set some drawbacks such as labor-intensive, lack of real-time data, and high operation and equipment costs. In this research, the aim is to implement the Internet of Things (IoT) in monitoring the water quality and controlled it. The pH and temperature sensors were integrated with NodeMCU ESP82666 to collect water pH and temperature data. This platform is also used to control the servo motor for managing systems. NodeMCU sends the data through the Internet to the Blynk application. Using Blynk, users can monitor live data from the tank, see the data trend, and control the water quality. All the data that has been taken saved in the cloud database using phpMyAdmin. The connection also used NodeMCU ESP8266, where the coding was written and compiled using Arduino IDE software. This project has successfully achieved its objective where water quality data (pH and temperature) can be monitored, stored in a database, and water pH levels can be controlled using IoT.

Characterization of FGD sludge from one of Glass industrial in Malaysia and their potential as ceramic mould

Fatin Fatini Othman[1], Banjuraizah Johar[1,], Khor Shing Fhan[2], Nik Akmar Rejab[3], Suffi Irni Alias[1] and Syed Nuzul Fadzli Adam[4]

[1]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia
[2]Faculty of Electrical Engineering Technology, Univerisiti Malaysia Perlis (UniMAP), Perlis, Malaysia
[3]School of Materials And Mineral Resources Engineering, Universiti Sains Malaysia (USM), Penang, Malaysia
[4]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia

Abstract. Flue Gas Desulfurization (FGD) is a process of waste incineration to eliminate sulfur dioxide (SO2) from exhaust flue gases power plants. Limestone/gypsum were injected in the plant to trap sulfur dioxide and change their chemical composition from calcium carbonate to calcium sulfate dehydrate, known as FGD sludge wet scrubber. Nowadays, in order to overcome the environmental pollution that caused by the massive production of FGD sludge waste, recycling is necessary. In this research, FGD sludge was characterized to describe their chemical composition, crystalline phase and their characteristic from FTIR spectra. FGD sludge recorded a moderate alkaline with pH 8.24. Based on XRD result, FGD sludge was mainly composed with gypsum (CaSO4•2H2O) and anhydrite (CaSO4). XRF analysis on the other hand shows FGD sludge was mainly composed with calcium oxide, sulfur trioxide, silica and potassium oxide.

Design and Analysis on Payload Container for Air Quality Measurement Device

*N.M. Zahari[1], H.F. Khamarudin[2], M.H. Zawawi[1], F. Nurhikmah[1], Nurhanani A. Aziz[1], Aizat Abas[3] and Ling. Calvin T.X.[3]

[1]Department of Civil Engineering, College of Engineering, Universiti Tenaga Nasional (UNITEN), 43000 Kajang, Selangor, Malaysia.
[2]BIP Studio, 43650, Bandar Baru Bangi, Selangor, Malaysia.
[3]School of Mechanical Engineering, Engineering Campus, Universiti Sains Malaysia, 14300 Nibong Tebal, Pulau Pinang, Malaysia

Abstract. The payload design was focusing entirely on making it easy to install based on the given circumstances. The analysis was done to ensure that the drone frame can withstand the weight of the payload, with the structure designed to be as light as possible, while maintaining the strength to carry the load. Therefore, it is needed to determine whether the drone can hold on while having the payload with the given weight. The payload design needs to be easily secured on to the drone while being able to fit in all the necessary equipment for the air quality measurement system. Numerical Method is used to design and analyze using Finite Element Analysis (FEA) method for drone frame and the payload mount. The FEA method showed the amount of stress and strains on the critical part of the body frame, and it also provides the displacement result of the analysis when the payload is secured onto the drone frame. Based on the results, the study shows that the amount of stress and strain put on the mounting is within the tolerable limits at a maximum value of 4.086e+06 and 6.153e-04 for both stress and strain, respectively.

Drone Payload Air Quality Measurement Device (D-PAQ) using Arduino Based

*N.M. Zahari[1], H.F. Khamarudin[2], M.H. Zawawi[1], Nurhanani A. Aziz[1], F. Nurhikmah[1], and Aizat Abas[3]

[1]Department of Civil Engineering, College of Engineering, Universiti Tenaga Nasional (UNITEN), 43000 Kajang, Selangor, Malaysia.
[2]BIP Studio, 43650, Bandar Baru Bangi, Selangor, Malaysia.
[3]School of Mechanical Engineering, Engineering Campus, Universiti Sains Malaysia, 14300 Nibong Tebal, Pulau Pinang, Malaysia

Abstract. Air quality issues are a common problem for our country, especially in urban areas and construction sites. It is crucial to monitor the current ambient air quality based on the guidelines and analyze the trends of air pollutants concentration. Access to data by stationary equipment and size is a significant challenge in the monitoring and measuring air quality. The current study aims to conduct field testing to ensure the reliability of the drone payload air quality measurement device (D-PAQ). This research used an Arduino-based sensor system fitted into a box mounted onto drones, and measurements can be taken freely without air quality measurement sites' restrictions. The findings show that the device can record all the necessary air quality monitoring, especially PM2.5 and PM10. It can be concluded that D-PAQ can be used as a new air quality monitoring device, especially at challenging reach areas such as construction sites.

Effect of pressing time on the properties of particleboard made using glutaraldehyde-treated oil palm particle

Nur Hidayah Abdul Rahman[1], Mohd Hazim Mohamad Amini[1], Nurul Syuhada Sulaiman[2], Rokiah Hashim[2], Mazlan Mohamed[1], Nadiah Ameram[1], Nik Alnur Auli Nik Yusuf1 and Samet Demirel[3]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.
[2]School of Industrial Technology, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia.
[3]Faculty of Forestry, Karadeniz Technical University, 61080 Trabzon, Turkey.

Abstract. Oil palm biomass is an abundant source of material. Mass production of palm oil results in increasing amount of waste where roughly 4 kg of dry biomass is produced for each palm oil obtained, with a third is found in fresh fruit bunch (FFB) derived wastes. In contrast, the other two-thirds are represented by trunk and frond material. This problem might be a contribution to the increment of wastes production. One of the alternatives ways is to utilise the oil palm biomass by producing particleboard from oil palm trunk particles. This study was conducted to focus on the effect of pressing time on the properties of particleboard made using glutaraldehyde treated oil palm particle. The different pressing time used in this experiment was 10, 15 and 20 minutes. The made particleboards were tested for their physical and mechanical properties. Results found that the particleboard of 15 minutes pressing time particleboard has the highest value with 390.48 N/mm² and 2.61 N/mm² of MOE and MOR, respectively. Therefore, the 15 minutes pressing time is considered optimum to produce the particleboard with higher strength.

Engine Performance Analysis by Studying Heat Transfer in the Valve Seat through Steady-State Thermal Simulation

M. A. S. M. Hassan[1,2,], A. B. Shahriman[1,2], Z. M. Razlan[1,2], N. S. Kamarrudin[1,2], W. K. N. Khairunizam[1,3], M. S. M. Hashim[1,2], A. Harun[1,4], I. Ibrahim[1,2], I. Azizul Aziz5, Z. Ibrahim[1,6], M. K. Faizi[1,2], M. F. H. Rani[1,2], A. Rahman[1,2], M. F. H. Rani[1,2], M. A. Rojan[1,2] and R. Murali[1,2]

[1]Faculty of Mechanical Engineering Technology, Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[2]Motorsport Technology Research Unit (MOTECH), Universiti Malaysia Perlis, Kampus Tetap Pauh Putra, 02600 Arau, Perlis, Malaysia
[3]Faculty of Electrical Engineering Technology, Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[4]Faculty of Electronic Engineering Technology, Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[5]Modenas Research and Development Divison, Kawasan Perusahaan Gurun, 08300 Gurun, Kedah Darul Aman, Malaysia
[6]Department of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Brunei, Tunku Highway, Gadong BE1410, Brunei Darussalam.

Abstract. As the engine reached high speed, the exhaust valve temperature increased exponentially due to the exhaust gas produced by the combustion process between the mixture of air and fuel within the combustion chamber of the internal combustion engine. The valve is subjected to thermal loading due to high temperature and pressure within the cylinder, which must withstand a material temperature for sustainable and optimal operation. To avoid this loss, a perfect medium must be prepared to ensure that the heat is extracted smoothly. This can be done when the valve is in contact with the seat and there is a periodic heat transfer contact. Therefore, it is imperative to research the correlation between valve and valve seat to understand the two sections' heat transfer mechanism. In this study, thermal contact analysis was used to identify heat transfer between the valve and the valve seat as both parts are interconnected. This research is also interesting in studying the two surface conduction mechanism as the exhaust valve closed in steady-state conditions. To facilitate the proposed model's operation, ANSYS Workbench is used to extract meaningful information, particularly for the distribution of temperature, heat flux, and heat flux direction.

Evaluation of the Effect of Urea as Plasticizer on The Properties of Glutardialdehyde Modified Starch

Umi Nurulain Nizamuddin Shah[1], Nurul Syuhada Sulaiman[2], Mohd Hazim Mohamad Amini[1], Mazlan Mohamed[1], Boon Jia Geng[1], Rozyanty Rahman[3] and Uğur Bilgin[4]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.
[2]School of Industrial Technology, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia.
[3]Center of Excellence Geopolymer and Green Technology, School of Materials Engineering, Universiti Malaysia Perlis, 01007 Kangar, Perlis, Malaysia
[4]Faculty of Forestry, Karadeniz Technical University, 61080 Trabzon, Turkey.

Abstract. Biodegradable products are in high demand nowadays as the concern on non-degradable plastics is on the rise. This paper reports on the thermoplastic made from glutaraldehyde modified corn starch with urea as the plasticizer. The corn starch was diluted in 2M concentration of NaOH and mixed with 20% concentration of glutardialdehyde. Then, urea was added at 20%, 35% and 50% based on the weight of starch. Thermoplastic starch was characterized using the FT-IR and TGA. Thermoplastic panels were made and evaluated for physical and mechanical properties. The FT-IR analysis has identified that the samples have a nitrogen-containing compound and carbonyl group as a functional group. The bending and tensile strength test show that sample with 50 % urea outperformed the other samples in term of mechanical strength. The higher amount of urea compound helps to improve the mechanical performance of the thermoplastics samples.

Influence of preparation method on properties of natural rubber/ sepiolite composites

Patiwarada Jitsopin[1], Abdulhakim Masa[1,], Nabil Hayeemasae[2], and Mohamad Syahmie Mohamad Rasidi[3,4]

[1]Rubber Engineering and Technology Program, International College, Prince of Songkla University, Hat Yai, Songkhla, 90110 Thailand.
[2]Department of Rubber Technology and Polymer Science, Faculty of Science and Technology, Prince of Songkla University, Pattani Campus, Pattani, 94000 Thailand.
[3]School of Materials Engineering, Universiti Malaysia Perlis (UniMAP), Kompleks Pusat Pengajian Jejawi II, Taman Muhibah, Jejawi, 02600 Arau, Perlis, Malaysia
[4]Center of Excellence Geopolymer and Green Technology (CEGeoGTech), School of Materials Engineering, Universiti Malaysia Perlis, (UniMAP), 02600 Jalan Kangar-Arau, Perlis, Malaysia.

Abstract. Natural rubber (NR) composites filled with various sepiolite loadings were prepared by using two different mixing method, namely, one step melt mixing method and two steps latex mixing method. Influence of mixing methods and sepiolites contents (0-10 phr) on viscosity, stress relaxation, curing behaviors and tensile properties of rubber composites were investigated. Addition of sepiolite filler increased viscosity, depending on the method of mixing and filler loading level. The greater interaction between rubber and sepiolite filler was obtained from melt mixing method. The curing properties and elongation at break of both preparation methods showed the same trend of changes, depending on the filler loading. The greatest tensile strength was obtained from the melt mixing method and the highest value was obtained at 1 phr sepiolite loading in all mixing methods.

Novel pneumatic system for lime dosage in water treatment application

*Farid Othman[1,2], Nur Azam Abdullah[1,2] , Erwin Sulaeman[1] , and Sher Afghan Khan[1]

[1]Department of Mechanical Engineering, Kulliyyah of Engineering, International Islamic University Malaysia, Jalan Gombak, 53100, Kuala Lumpur.
[2]Aqua Oleo Sdn Bhd, No 18, Bengkel Industri Keda, 08700, Jeniang, Kedah.

Abstract. This paper proposed a new pneumatic mechanism for lime dosage in water treatment application. Conventionally, current water treatment system technologies utilising pump system, which requires scheduling maintenance of operation to avoid choke problem due to scaling development. The choke formation depends on the concentration of the lime dosage, which will be based on the time of operations. Technically, pneumatic system uses such hydraulic mechanism consists of fluid especially liquid oil to operate, hence needs higher maintenance cost. Based on that arguments, this research tends to investigate the potential of replacing pump system with air pneumatic system for water treatment. For that reason, this study proposed a new design of pneumatic mechanism as the alternative solution for pump system. Several analyses have been performed from the perspective of fluid mechanics to study the water treatment plant flow rate that could the competitive with the conventional pump system.

Performance of Castor Oil and Neem Oil as Metal Cutting Fluids in Drilling Inconel 718 using MQL Technique on Tool Wear and Surface Roughness

*Syahilia Syahira Safie[1], Muhamad Nasir Murad[2], and Tan Chye Lih[1]

[1]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Pauh Putra Campus, 02600, Arau, Perlis, Malaysia.

Abstract. Inconel 718 is hard to cut material due to its high hardness, high strength at elevated temperatures, low thermal diffusivity and affinity to react with tool materials. The high temperature during machining results in aggressive tool wear and poor hole quality. Therefore, the application of metal cutting fluids (MCF) as a lubricating and cooling agent is very significant in the drilling of nickel-based superalloys such as Inconel 718. The present study embraces these issues by evaluating the performance of non-edible vegetable oils such as castor and neem oil under minimal quantity lubrication (MQL) conditions towards the tool wear and surface roughness. The drilling experiments were carried out using coated (TiAlN) carbide drill with diameter of 6 mm at different cutting speeds of 10 and 20 m/min and a constant feed of 0.015 mm/rev. The results of this study showed that castor oil significantly outperformed the neem oil in drilling performance regarding tool wear and surface roughness.

Phase Transformation And Microstructure Characterization Of Ceramic Porcelain With Different Ratio Of Treated Fgd Sludge/Feldspar

Suffi Irni Alias[1], Banjuraizah Johar[1,], Syed Nuzul Fadzli Adam[2], Mustaffa Ali Azhar Taib[3], Fatin Fatini Othman[1], Khor Shing Fhan[4]

[1]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis Malaysia
[2]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis Malaysia
[3]Division of Advanced Ceramic Materials Technology (ADTEC) Taiping, Perak
[4]Faculty of Electrical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis Malaysia

Abstract. The porcelain formulation containing percentages of treated FGD sludge waste from 5% up to 15% in replacement of feldspar were prepared. The porcelain mixture formulation were mixed by high energy planatery mill at speed 300 rpm for 1 hours. The powder were compacted by using hydraulic press and sintered at temperature 1200 °C for 3 hours. The sintered samples were characterized using X-ray fluorescene (XRF), X-ray diffraction (XRD), Fourier Transform Infrared (FTIR) and Thermogravimetry/ Differential scanning calorimetry (TGA/DCS).

Physical and mechanical properties of non-stoichiometric cordierite with treated FGD sludge addition sintered at 1250°C

Fatin Fatini Othman[1] ,Banjuraizah Johar[1,], Khor Shing Fhan[2], Nik Akmar Rejab[3] and Suffi Irni Alias[1]

[1]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia
[2]Faculty of Electrical Engineering, Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia
[3]School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia (USM), Penang, Malaysia

Abstract. The effects of addition treated FGD sludge in non-stoichiometric cordierite, by benefiting from its high mechanical strength and good thermal performance, can hold promise for more practical applications of non-stoichiometric cordierite. Treated FGS sludge waste from borosilicate glass industrial were used as a flux to reduce the sintering temperature of cordierite. Cordierite ceramics were prepared using silica (SiO2), alumina (Al2O3), talc, kaolin, magnesia (MgO) and treated FGD sludge via solid-state reaction method. The cordierite were prepared by adjusting the ratio of FGD sludge and magnesia in the cordierite composition respectively. 4 composition of cordierite with 0%, 1.5%, 3.0% and 4.5% of FGD sludge were prepared to obtain the formation of α-cordierite that can be determine by X-ray diffraction (XRD) analysis. Archimedes principle, shrinkage, plastic limit and flexural strength for each of cordierite composition were determined to obtain the best composition of treated FGD sludge required for sintering aids of cordierite.

Rubberized Glutardialdehyde Modified Starch Plasticized with Ethylene Glycol

Amirul Fauzan Amerudin[1], Mohd Hazim Mohamad Amini[1], Nurul Syuhada Sulaiman[2], Rozyanty Rahman[3], Mazlan Mohamed[1], Sharizal Ahmad Sobri[1], Nurul Akmar Che Zaudin[1] and Anteneh Gezahegn Kebede[4]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.
[2]School of Industrial Technology, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia.
[3]Center of Excellence Geopolymer and Green Technology, School of Materials Engineering, Universiti Malaysia Perlis, 01007 Kangar, Perlis, Malaysia
[4]Faculty of Forestry, Karadeniz Technical University, 61080 Trabzon, Turkey.

Abstract. In the current past few decades, self-awareness towards the usage of biodegradable material in our daily life is still low among us. The dependence of the people towards the petroleum-based plastic are rapidly rises in the urbanization of industrial, agriculture, domestic, pharmaceutical activities and others. Thermoplastic starch is biodegradable material to be arising up recently due to its attribute as environment friendly and promote sustainable development. In this study, corn starch was used as the raw material where the ethylene glycol was the plasticizer and the glutardialdehyde is the cross-linkage agent. The natural rubber is added in order to make the modified starch to increase the water resistance of the starch. The rubber content 0%, 20% and 50% is acted as the parameter for this study. The higher percentage of rubber inclusion has lowered value of MOR and MOE. The MOE for 50% rubber content sample is 64.747 N/mm2 in tensile test. The MOR for 50% rubber content sample is 640.652 N/mm2 which is relatively lower than the 20% rubber content sample with 851.376 N/mm2. Based on the overall result, the physical characteristic shows higher rubber content has the high retention of water. However, the starch polymers are relatively unusable under extreme moisture condition as reflected in water absorption test.

Study The Structure Characterization of Porcelain Tile at Different Sludge Content

Suffi Irni Alias[1], Banjuraizah Johar[1,], Syed Nuzul Fadzli Adam[2], Mustaffa Ali Azhar Taib[3], Fatin Fatini Othman[1], Khor Shing Fhan[4]

[1]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis Malaysia
[2]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis Malaysia
[3]Division of Advanced Ceramic Materials Technology (ADTEC) Taiping, Perak.

Abstract. Porcelain tile formulation in the form of pellets have been studied by substituted fluxing materials with treated FGD sludge at different percentages. In this work, treated FGD sludge was added in percentages from 5% up to 15% uniaxially pressed at 11 MPa, dried and then sintered at temperature 1200 0C for 3 hours. Weight loss, volume shrinkage/expand, bulk density, densification, porosity and flexural strength were investigated on sintered samples.

A sustainable adsorbent for removal of ammoniacal nitrogen from landfill leachate: Isotherms modelling

*Mohd Arif Rosli[1], Zawawi Daud[2] , Mohd Baharudin Ridzuan[2] , Azra Munirah Mat Daud[2], Wesam Al Madhoun[2] , and Izat Yahya[3]

[1]Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Johor, Malaysia
[2]Advanced Waste Recovery and Air Studies (AWRAS), Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia, Johor, Malaysia
[3]Centre for Diploma Studies, Universiti Tun Hussein Onn Malaysia, Johor, Malaysia

Abstract. Four low cost sustainable biocomposite materials, limestone, peat, activated carbon and zeolite were employed as adsorbent media in an adsorption batch investigating the removal of ammoniacal nitrogen from stabilized leachate. Isotherm adsorption models of Langmuir and Freundlich were utilized to analyze the adsorption data. The Langmuir isotherm model showed the best fit for experimental data with a maximum monolayer adsorption capacity of 26.18 mg/g. The biocomposite adsorbent was found to be efficient and viable for the uptake of stabilized leachate from ammoniacal nitrogen. The adsorption isotherm follows Langmuir's model (R2 = 0.99) and Freundlich's model (R2 = 0.98).

Temperature measurement methods in an experimental setup during bone drilling: A brief review on the comparison of thermocouple and infrared thermography

*Md Ashequl Islam[1], Nur Saifullah Kamarrudin[1,2], Ruslizam Daud[1], Ishak Ibrahim[1,2], Anas Rahman[1,2], Fauziah Mat[1]

[1]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia
[2]Centre of Excellence Automotive & Motorsports (MoTECH), Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia

Abstract. Predicting thermal response in orthopaedic surgery or dental implantation remains a significant challenge. Traditionally thermocouple has frequently been used to predict the bone temperature in the drilling process. However, several experimental studies demonstrate that the invasive method using thermocouple is impractical in medical condition and preferred the thermal infrared (IR) camera as a non-invasive method. In the present study, a simplified experimental model based on thermocouple heat measurement approach and combined with the method of image sources is suggested. Furthermore, this work provides a significant opportunity to calibrate the thermal IR camera by finding out the undetected heat elevation in a workpiece depth.

Wood composite from Hevea Brasiliensis Sawdust and Thermoplastic Starch

Norma Ira Johari[1], Mohd Hazim Mohamad Amini[1], Rozyanty Rahman[3], Mazlan Mohamed[1], Sharizal Ahmad Sobri1 Nurul Syuhada Sulaiman[2], and Ali Temiz[4]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.
[2]School of Industrial Technology, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia.
[3]Center of Excellence Geopolymer and Green Technology, School of Materials
[4]Faculty of Forestry, Karadeniz Technical University, 61080 Trabzon, Turkey.

Abstract. Thermoplastic starch (TPS) is a bio-based material which can naturally degrade without giving any harmful effect to the environment. However, TPS has drawback which is low water resistance. Therefore, the objectives of this study were to examine the effect of rubberwood sawdust on the characteristic of wood-based thermoplastics and its strength by addition of wood particles. Glutaraldehyde modified starch was plasticized by ethylene glycol and mixed with different ratio of starch to sawdust (30:70, 50:50 and 70:30 w/w). The thermoplastic starch samples were tested for their physical and mechanical properties. Scanning election microscopy, thermal gravimetric analysis, fourier transform infrared spectroscopy, tensile and bending test were used for the characterization and of the samples. The density of TPS decreased as the composition of sawdust increased. Thickness swelling showed that the higher the sawdust ratio to starch, the higher the thickness swelling of the samples. Tensile strength and bending strength test showed that the ratio of sawdust give effects to the TPS. The ratio starch to sawdust 50:50 gave the highest MOE and lowest MOE values. These results indicate that different proportions of sawdust improve the properties of thermoplastic starch.

Mechanisms of Microbiological Influence Corrosion through Iron-Reducing Bacteria

N A A Jamaluddin[1], M N Masri[1], S K Wee[1], PT Teo[1]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli Kelantan, Malaysia

Abstract. Various microbes including iron-reducing bacteria (IRB) are found on corroded iron structures. In particular, they attack the steel by electrochemical reaction causing an atom to lose electrons and become ions. IRB are anaerobes possess such Fe(III)-reducing in their respiratory capabilities. They are able to reduce ferric ion, Fe+3 to ferrous ion, Fe+2 under anaerobic conditions. IRB is one of the main reason that affect MIC through reduction of insoluble Fe+3 compounds into soluble Fe+2 compounds by removing protective corrosion scales on steel pipelines surface.

Liquid LPG Injection Behavior in a Spark Ignition Engine at Idle State Condition

*Norrizal Mustaffa[1,a], Mas Fawzi[2], Amir Khalid[1], Norrizam Jaat[1], Mohd Mustaqim Tukiman, Khairu Kamarudin, Shaiful Rizal Masrol, Mohd Faizal Esa

[1]Automotive and Combustion Synergies Technology Group, Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Johor, Malaysia
[2]Centre for Energy and Industrial Environment Studies (CEIES), Universiti Tun Hussein Onn Malaysia

Abstract. LPG has emerged as an alternative fuel due to several reasons such as to establish the energy security for future usage. The usage of LPG in spark ignition engine has been around since few years ago. The LPG fuel injection technology has evolved from gas injection into liquid injection. Since the liquid phase injection is a latest technology, the present study aims to perform an analysis and comparison of LPG liquid phase injection and gasoline at idle state condition. The torque and performance curve were also been analyzed as an additional data. A four stroke 1.6L naturally aspirated engine was used for the experiment and few devices were attached to the engine in order to collect the required data. As summary, emissions of carbon based product of liquid phase LPG injection were found lower than gasoline and the combustion stability of LPG was observed in acceptable limit. Other than that, liquid phase LPG injection also capable to produced higher power output as compared to the gasoline.

Review Paper; Employing of Soft Sensor Modelling in the Field of Advanced Control System in Oil Industries Using Data Mining and Machine Learning Techniques

*Al Jlibawi Ali Hussein[1], Othman Mohammed Lutfi[2], Al Huseiny Muayed S.[3], Aris Ishak[4], and Bahari Samsul[5]

[1]Dept. of Electrical and Electronic Engineering, UPM, Selangor, Malaysia
[2]Dept. of Electrical and Electronic Engineering, UPM, Selangor, Malaysia
[3]Faculty of Engineering, University of Wassit, Kut, Iraq
[4]Dept. of Electrical and Electronic Engineering, UPM, Selangor, Malaysia
[5]Dept. of Electrical and Electronic Engineering, UPM, Selangor, Malaysia

Abstract. In modern industries environment, huge amounts of data are collected in database management system and data depositories from all processes and control systems areas, including product and process design, assembly, materials planning, quality control, scheduling, maintenance, fault detection, process control encroachment and others. Data mining and machine learning techniques have emerged as an essential tool for knowledge acquisition from the industries database and teaches a computer how to learn and comprehend the specified parameter. Statistical review paper has introduced to search various applications of soft sensor-based data mining and machine learning methods. This paper reviews the literature dealing with applications of virtual sensor into main four fields; supporting of physical sensors, improvement of the control systems, replace of analyser and real time controller reports of monitoring and diagnosing of the control system.

Motorcycle Warning System with a Call and an Emergency Button Based on Internet of Things (IoT)

*Selamet Samsugi[1], Wajiran[2], and Farli Rossi[3]

[1]Department of Electrical Engineering, Faculty of Engineering And Computer Science, Universitas Teknokrat Indonesia, Bandar Lampung, Indonesia.

Abstract. The crime of theft and robbery appears almost every day in newspapers, printed and online media. Many motorbikes were lost while parked. Likewise, this incident often occurs with motorbikes' confiscation, even causing casualties if there is resistance by the motorbike owner. Usurpers do not hesitate to injure or even kill victims who resist. From the results of the study literature, the warning system is only made for parked motorbikes. Based on these problems, the researcher intends to develop a parked and driven motorcycle warning system and avoid casualties when there is a motorbike robbery. Based on the research results, this system's development has resulted in 2 safety methods: when the motorcycle is parked and when the motorcycle is being driven. The parking warning system will be made in the form of a telephone call to the vehicle owner. For the driven motorcycle system, the motorbike is given an emergency button that is placed on the dashboard side so that when a seizure occurs, the vehicle owner presses the emergency button and gives up the motorbike. Based on the test results for a parked motorcycle, the telephone call is active when activating the ignition before the on / off switch is activated. Apart from telephone calls, the system will also activate the horn and front/rear turn signal lights. From the results of testing the emergency button, which was carried out about 15 times, it can be concluded that the emergency button is working. The shortest response time was about 10 seconds and the longest response time was about 10.9 seconds. The average value of system response time is 10.42 seconds.

Behavior Study Of Composite Media Adsorption On Contamination Of Plastic

*Mohd Baharudin bin Ridzuan[1], Zawawi Daud[1], Azra Munirah Mat Daud[1], Wesam Al Madhoun[1], Mohd Arif Rosli[2,] and Izat Yahya[3]

[1]Advanced Waste Recovery and Air Studies (AWRAS), Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia, Johor, Malaysia.
[2]Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Johor, Malaysia.
[3]Centre for Diploma Studies, Universiti Tun Hussein Onn Malaysia, Johor, Malaysia.

Abstract. Zeolite, commercial activated carbon and the combination of both media was studied for the removal of heavy metal ions in contamination of plastic waste in saline water. Commercial activated carbon from local wood was investigated as a suitable adsorbent for the removal of heavy metal ions which is copper from contaminate saline water through batch adsorption process. The initial and final concentrations were determined by adsorption inductively coupled plasma – mass spectrometry (ICP – MS). For the adsorption result that has obtained shows that activated carbon and combination of these two media able to remove the heavy metal more efficiently compared to zeolite and with percentage of removal was 91.72% in 30g of activated carbon and 10g of combination media with 90.38%. Meanwhile, the percentage removal of zeolite was 88.10% in 50g of zeolite. Thus, activated carbon and combination of these two media is effective in removing copper. The model of Langmuir is more appropriate to represent the experimental equilibrium. In addition, the pH was within the range 7 which not exceeding the permissible value in EPA standard.

Potential Of Sago As Alternatives Materials For Green Energy In Rural Area

*M.N. Masri1[1], M.A. Sulaiman[1], M.A Ayob[2], M. Mohamed[1] and M.B. Abu Bakar[1]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli, Kelantan, Malaysia.
[2]Faculty Agro Based Industry, University Malaysia Kelantan, 17600 Jeli, Kelantan, Malaysia.

Abstract. Sago is another natural polymer and characterized as starch. Sago is powdery gel made from processed pith found inside the trunks of the Sago Palm Metoxylon sago. Sago palms grow in many countries in the south-east Asia region. Sarawak is the main area in Malaysia that plant sago trees. The palm has reached maturity which is about 12 years, it is felled and the bark is removed. It has been used by the locals for hundreds of years as food, and now is the subject of intense studies as the main option for starch source of the future. In Malaysia and Indonesia, sago from Metroxylon is widely used in food industry including for making noodles and white bread. While, in India pearl sago is called Sabudana and is used in variety of dishes including wafer and puddings. Besides, natural sago has a unique structure, characteristics and useful materials for the bio-industry. It is used for the synthesis of fiber, resin, plastic and lubricant. The composition of sago gel was soluble dietary fibers approximately 73.7% starch. Basically, natural sago gel undergoes high breakdown during heating and shearing. Many types of chemical modifications have been applied to starches of various plant sources. Natural sago gel exhibits long cohesive gels with very high gel strengths that are undesirable for application in canned foods. The alkalizing agent has used to modify starch properties. Inclusion of alkali gives a characterization aroma and flavor, as well as a firm and classic texture to the product. Moreover, the presence of sodium carbonate and sodium hydroxide in other word additional of alkali retarded the retrogradation of aged gels. The other potential sago is in the hydroponic plantation since the gels properties can be the reservoir to retain the water contents. This paper reviews the potential of sago as an alternative natural resources for green energy in rural area.

A Hierarchical Neural Network For Identification Of Multiple Damage Using Modal Parameters

*SJS. Hakim[1], JM. Irwan[1], MHW. Ibrahim[1], SS. Ayop[1], N. Anting[1] and TNT. Chik[1]

[1]Faculty of Civil Engineering and Built Environment, University Tun Hussein onn Malaysia (UTHM), 86400 Parit Raja, Batu Pahat, Johor, Malaysia.

Abstract. Reduction in the structural stiffness produces changes in the dynamic characteristics such as the natural frequencies and mode shapes. Artificial neural networks have been applied extensively in recent years due to their excellent performance in pattern recognition, which is useful for detecting damage in structural elements. In this paper, an ensemble neural network based on damage identification techniques was developed and applied for damage localization and severity identification of quad-point damage cases in I-beam structure. Experimental modal analysis and finite element simulation were carried out for I-beam with four-point damage cases to generate the modal parameters of the structure. Based on the results, it is found that the ensemble neural networks achieve a high detecting accuracy and good robustness of quad-point damage cases in I-beam structures.

A Study Of Different Materials Of Geogrid By Using Finite Element Model

*Aida Atiqah Binti Atil[1], Nik Normunira Binti Mat Hassan[1], Fatimah Mohamed Yusop[1], Anika Zafiah M. Rus[2], Abdul Mutalib Leman[1], and Noraini Marsi[1]

[1]Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Pagoh Higher Education Hub, 84600 Pagoh, Muar, Johor, Malaysia.
[2]Sustainable Polymer Engineering, Advance Manufacturing and Material Center (AMMC), Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia,86400 Parit Raja, Batu Pahat, Johor, Malaysia.

Abstract. In recent years, environmental concerns related to the over exploitation of natural resources and the need to manage large amounts of wastes arising from construction activities have intensified. This paper presents a preliminary study carried out to characterize the interaction impact with different material geogrids (a polyester (PET), high-density polyethylene (HDPE), and polyurethane (PU) geogrid through Finite Element Model (FEM) simulation. The effects of the geogrid specimen size, displacement rate by the pressure through the geogrids are evaluated and discussed. Test results shows that the measured peak pullout resistance of the geogrid increases with the specimen size, imposed displacement rate The pressure ranged from 10 000 N/m2 and 50 000 N/m2. The FEM analysis result is important due to quantify the benefit-cost ratio of geo-synthetics application in pavements needed for a detailed Life-Cycle Cost Analysis (LCCA).

Bibliometric Analysis Of Research On Plastic Waste In Southeast Asian Countries

*Ang Lee Sin[1], Sharizal Hasan[1], Noor Hafizah Uyup[1], Nur Syakira binti Muhammad Imran[1], Siti Zulaikha binti Zainal Abidin[1], and Mohd Lias Kamal[1]

[1]Faculty of Applied Sciences, Universiti Teknologi MARA Perlis Branch, Arau Campus, 02600 Arau, Perlis.

Abstract. Plastic waste is a type of pollution that have been widely studied by researchers. It is a classic problem in the field of polymer and environment, affecting almost every aspect of our lives. Southeast Asia is a major contributor to the plastic that is choking the world's oceans, owing to the rapid economic growth and urbanization. Furthermore, the change in lifestyle, the need of an updated materials and the keen of in improving the country also contribute to the expanded of plastic use. It seems impossible for the developing countries to stop using plastics. One of the concerns on plastics is the degradability, in which long period of time is needed. Even though governments have come out with measures and incentives, the problems from the plastic waste pollution are not going to end anytime soon. The purpose of this investigation is to identify and describe the scientific research on plastic waste through scientometric study. Scopus database was used to collect the related literature from 1997 to 2020. The software used for the study was Microsoft Excel and VOSviewer. Using the specified keywords, 499 publications were presented from the Scopus database with a total of 4806 citations. Of the countries considered, Indonesia and Malaysia churned out the most publications in plastic waste.

Optimization Of The Rice Bran Protein Powder Yield Using Spray Drying Technique In Response Surface Methodology

Mohd Rizuan Mansor[1], *Mohd Sharizan Md Sarip[1], Lokman Hakim Ibrahim[1], and Syahrul Affandi Saidi[2]

[1]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis, Kompleks Pusat Pengajian Jejawi 3, 02600, Arau, Perlis.
[2]Faculty of Electrical Engineering Technology, Universiti Malaysia Perlis, Kampus Alam UniMAP, Pauh Putra, 02600, Arau, Perlis.

Abstract. In this study rice bran protein were extracted and powdered using spray dryer. The optimization of the process were done using Box-Behkenn response surface design. Process parameter such as temperature (120°C,165°C,210°C), aspirator (52%,66%,80%) feed flow rate (5%,30%,55%) and air flow rate (20%,30%55%) were investigated. The result show that the extraction condition have significant effects on extraction yield of protein the obtained experimental data were fitted to a quadratic equation using multiple regression analysis with high coefficient of determination value of 0.8137.an optimization study using Derringer's desired function methodology was performed and the optimal conditions based on both individual and combinations of all independent variable for yield (temperature is 120˚C, Aspirator is at 80% feed flowrate set to 5% and air flowrate of 42mmhg) and protein (temperature is 120˚C, aspirator were set at 79.9%, feed flowrate set to 31.8% and air flowrate of 51mmhg) were determined with maximum protein yield of 17.29% per 50 gram of raw rice bran (RRB).

Comparative Analysis Of Infinite And Finite Magneto-Elastohydrodynamics Slider Bearings Lubricated With Couple Stress Fluids

*Mouda Mouhcine[1], Nabhani Mohamed[1], and El Khlifi Mohamed[1]

[1]Hassan II University of Casablanca, Faculty of Sciences and Techniques, Mohammedia, Morocco.

Abstract. This paper presents a comparative analysis of inclined infinite and finite slider bearings lubricated with conducting couple stress fluids in the presence of externally applied magnetics fields taking into account the elastic deformation of stationary surface. The modified two-dimensional magneto-elastohydrodynamic couple stress Reynolds type equation is derived. This governing equation is solved numerically using finite difference scheme, which involves the Gauss–Seidel method to obtain the bearing characteristics. The characterization of the load capacity and friction coefficient for different values of profile parameter, compliance coefficient, couple stress and Hartman number is presented. The present results are validated by comparison against available published data.

Crystal Structure And Thermal Behaviour Of Calcium Monosilicate Derived From Calcined Chicken Eggshell And Rice Husk Ash

Nur Hazlinda Jakfar[3], *Khor Shing Fhan[1,2], , Banjuraizah Johar[3], Nur Maizatul Shima Adzali[3], Siti Nur Hazwani Mohd. Yunus[2], and Cheng Ee Meng[4,5]

[1]Centre of Excellence for Renewable Energy (CERE), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[2]Faculty of Electrical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[3]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[4]Advanced Communication Engineering, Centre of Excellence (ACE), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[5]Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.

Abstract. This study focuses on the synthesis of synthetic calcium monosilicate ceramic from chicken eggshells and rice husks waste through the mechanochemical route that relatively straightforward without adding any binders. Synthetic calcium monosilicate was mixed using a 1:1 ratio of calcined eggshell and rice husk ash, which both materials known as rich in calcium oxide and silica sources, respectively. The mixed powder was pressed using uniaxial pressing before fired at 1100oC, 1150oC, 1200oC, 1250oC, and 1300oC for 120 minutes with a heating rate 5oC/min. The XRD spectrum mainly consists of pseudowollastonite (ICSD: 98-005-2576) phases, along with wollastonite and silicon dioxide phases. However, as the sintering temperature increases, wollastonite phases started to change into pseudowollastonite completely with some unreacted silica.

Feasibility Study Of Canola Oil As Dielectric Fluid For Sustainable Micro Electric Discharge Machining (µedm)

Mohamad Syazwan Mohd Zain[1], Norazkifni Faizura Dzulkifli[1] and *Azuddin Mamat[1]

[1]CPDM, Department of Mechanical Engineering, Faculty of Engineering, University of Malaya, Kuala Lumpur, 50603, Malaysia.

Abstract. Currently, usage of kerosene as dielectric fluid creating a sustainability issue in electrical discharge machining (EDM). This work was undertaken to study the machining performance of µEDM on titanium alloy, using copper electrode. The dielectric fluid for this project was water, kerosene and canola oil. The quality of EDM process in relation to machine parameters and different electrodes sizes and work piece were investigated. The effect of varying the machining parameters on the machining responses such as material removal rate (MRR), electrode wear ratio (EWR) and circularity were identified. Result showed that Canola oil as dielectric fluid has a significant effect on machining performance.

Trend Analysis Of Dissolved Organic Matter In A Subtropical Drinking Water Supply Reservoir

*Chow M.F. [1], Haris H[2]., and Leong Y.X[2]

[1]Institute of Sustainable Energy (ISE), Universiti Tenaga Nasional, jalan IKRAM-UNITEN, 43000 Kajang, Selangor, Malaysia.
[2]College of Engineering (COE), Universiti Tenaga Nasional, jalan IKRAM-UNITEN, 43000 Kajang, Selangor, Malaysia.

Abstract. This study evaluates the long-term trends of dissolved organic matter (DOM) in Fei-Tsui Reservoir in Northern Taiwan during the periods of 1986 to 2014. Understanding the temporal and spatial mechanisms of nutrient enrichment is essential to control water quality. Here, we assess the long-term trends of runoff and DOM concentration (1986–2014). Mann–Kendall trend test (MKT) analysis was used to assess the significance of monotonic trends (increase and/or decrease) in runoff, weather related parameters, and DOM. We observed that the dominant trends in streams and reservoir water surface were declining trends of dissolved organic nitrogen (DON), biochemical oxygen demand (BOD) and chemical oxygen demand (COD). Although some inflow tributaries also showed some increasing trends but not significant. The observed decreasing trends in DOM suggested that re-oligotrophication process is taking place in the reservoir.

Long-Term Patterns Of Trace Elements In Drinking Water Supply Reservoir

*Chow M.F.[1]

[1]Institute of Sustainable Energy (ISE), Universiti Tenaga Nasional, jalan IKRAM-UNITEN, 43000 Kajang, Selangor, Malaysia.

Abstract. The present study evaluates the long-term patterns of trace elements in Fei-Tsui Reservoir, Northern Taiwan during the periods of 1986 to 2014. The understanding of nutrients temporal and spatial mechanisms is essential to control the quality of a water system. Here, we assess the long-term trends of runoff and trace elements concentration for the period of 1986 to 2014. Mann–Kendall trend test (MKT) analysis was used to assess the significance of monotonic trends (increase and/or decrease) in runoff, weather related parameters, and trace elements. The results showed that the dominant trends in streams and reservoir water surface were declining trends of sulphate (SO4), chloride (Cl) and iron (Fe) with slightly increasing trends of calcium (Ca) and magnesium (Mg). Both SO4 and Cl concentrations showed statistically significant decreasing trends and this indicated the recovery from acidification in Fei-Tsui Reservoir. Positive trends in Ca and Mg may also indicate the recovery from acidification in Fei-Tsui Reservoir. The observed decreasing trends in trace elements suggested that re-oligotrophication and reduction of industrial SO2 emissions are the dominant drivers for trace element dynamics in this study.

Phase Analysis Of Bio-based Derived Tricalcium Disilicate From 2CaO:1SiO2 By X-ray Diffraction

Siti Nur Hazwani Yunus[1], *Khor Shing Fhan[1,2], Banjuraizah Johar[3], Nur Maizatul Shima Adzali[3], Nur Hazlinda Jakfar[3], and Cheng Ee Meng[4,5]

[1]Faculty of Electrical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[2]Centre of Excellence for Renewable Energy (CERE), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[3]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[4]Advanced Communication Engineering, Centre of Excellence (ACE), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[5]Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.

Abstract. In this paper, tricalcium disilicate was formed from dicalcium silicate compound powder, which was synthesised via a mechanochemical technique using a stoichiometric of 2CaO:1SiO2. Compound CaO and SiO2 were derived from the bio-waste of eggshell and rice husk at the calcination temperature of 900oC and 800oC, respectively. The dicalcium disilicate powder was sintered for 2 hours at different temperatures ranging from 1150oC to 1350oC. Using X-ray diffraction with Rietveld analysis, it was found that the amount of tricalcium disilicate with monoclinic (beta) crystal structure increases on sintering temperature at the expense of dicalcium silicate. The complete formation of single-phase tricalcium disilicate began at a sintering temperature of 1300oC. The effect of sintering temperatures on the crystallisation and phase transition of dicalcium silicate is reported. The size of crystallites depends on the sintering temperature.

Recycling Of Metallurgical Steel Slag Waste As Partial Replacement Of Raw Materials For Sustainable Clay-Based Ceramics: A Brief Review

*Siti Koriah Zakaria[1], Nurulakmal Mohd Sharif[2], Anasyida Abu Seman[2], Mustaffa Ali Azhar Taib[3], Julie Juliewatty Mohamed[1], Mahani Yusoff[1], Abdul Hafidz Yusoff[1], Mardawani Mohamad[1], Mohamad Najmi Masri[1], Arlina Ali[1], and *Pao Ter Teo[1]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.
[2]Structural Materials Niche Area, School of Materials and Mineral Resources Engineering, Universiti Sains Malaysia, Engineering Campus, Seri Ampangan, 14300 Nibong Tebal, Penang, Malaysia.
[3]Division of Advanced Ceramic Materials Technology, Advanced Technology Training Center (ADTEC) Taiping, 34600 Kamunting, Perak, Malaysia.

Abstract. Lately, tremendous industrial wastes such as glass waste, clay-ceramic waste, fly ash, sludge and metallurgical steel slag, particularly electric arc furnace (EAF) slag have been progressively recycled as partial replacement of raw materials in sustainable clay-based ceramics such as brick, ceramic tile and roofing tile. Among these waste, metallurgical steel slag could be an excellent sustainable choice due to its similar chemical composition as raw materials for the ceramics. From literature surveys, the first attempt of recycling the slag into ceramics was proposed by Badiee et al. (2008) [1] and they have successfully utilized the slag generated by one of the steel making plants in Iran. This idea was further succeeded by Sarkar et al. (2010) [2] by reusing the slag waste generated in India. To the best of author's knowledge, this current research work (Teo et al., 2014 and Teo et al., 2019) [3,4] is the third attempt and the research is focussing on utilization of Malaysia's metallurgical steel slag into clay-based ceramics, i.e. ceramic tile. Therefore, this article will be briefly reviewing the previous and current progresses as well as achievements on efforts of recycling the worldwide metallurgical steel slag as partial replacement of raw materials in sustainable clay-based ceramics. The brief review will focus on body formulation, firing temperature, properties of the ceramics, as well as sintering mechanism involved during the firing process.

Removal Of Cadmium Using Alkaline-Treated Activated Carbon From Leucaena Leucocephala Biomass

Wan Muhammad Hilmi Wan Ibrahim[1], Nurul Syuhada Sulaiman[2], *Mohd Hazim Mohamad Amini[1], Wan Rashidah Abdul Kadir[3], Mazlan Mohamed[1], Sitti Fatimah Mhd Ramle[1], and Uğur Bilgin[4]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.
[2]School of Industrial Technology, Universiti Sains Malaysia, 11800 Minden, Penang, Malaysia.
[3]Forest Research Institute Malaysia, 52109 Kuala Lumpur, Selangor, Malaysia.
[4]Faculty of Forestry, Karadeniz Technical University, 61080 Trabzon, Turkey.

Abstract. Water contamination that caused by heavy metals is a very common phenomenon in the industrial age. One of the popular way to treat metal contaminated water is by adsorption process using activated carbon as the adsorbent. This paper works on producing activated carbon by chemical means with impregnation ratios of NaOH:char (w/w) was predetermined at 1:1 (ACT1-1), 2:1 (ACT2-1) and 3:1 (ACT3-1) under activation temperature of 700 °C. In other to reduce cost of production, cheap raw material which is the Leucaena leucocephala was used as the precursor. The properties of these activated carbons and its potential for cadmium removal from aqueus solution was analyzed. It was found that the highest surface area was recorded at 662.76 m^2/g. Four parameters were studied which are contact time, the effect of pH, initial concentration of adsorbate and temperature. The equilibrium time was achieved in 40 min treatment at initial concentrations of 30 mg/l. The adsorbent exhibited good sorption potential for cadmium at pH 8.0 and equilibrium temperature of 30 oC. Based on the results, this study had proved that activated carbon from Leucaena leucocephala biomass have the good potential to be used for removal of cadmium from wastewater.

Reviews On Thermal Comfort At Educational Institutions Building: Laboratories And Workshops

*Noorazimah Mat Alias[1], and Umar Kassim[1]

[1]Faculty of Civil Engineering Technology, Universiti Malaysia Perlis, 026000 Arau, Perlis, Malaysia.

Abstract. This research paper aims to obtain information from previous studies related to thermal comfort in educational institutions buildings involving laboratory and workshop learning space. The study will touch on key factors in thermal comfort that include air temperature, radiant temperature, air velocity, relative humidity, metabolic rate and clothing insulation. Research are focused on the use of thermal comfort models, research methodologies, research findings, discussions and recommendations on the implementation of thermal comfort studies. The findings of this study can explain the influence of key variables on the level of thermal satisfaction of users in laboratories and workshops especially when the teaching and learning process takes place. Emphasis on comfort in the learning space is so important to ensure a positive impact on the physiology and psychology of its inhabitants. This research focuses on the need for thermal comfort in the Technical and Vocational Education and Training (TVET) learning space as its curriculum requires instructors and students to stay longer in this space for practical implementation. Finally, this journal is expected to help new researchers in studying the level of thermal comfort in the learning space of laboratories and workshops.

IConGETech2021_Effect Of Photodegradation On Chemical Characteristics And Enzymatic Digestibility Of Chicken Feather Keratin

*Fatihah Aziz[1], Zarina Zakaria[1], Syazwani Mahmad Puzi[1], and Huzairy Hassan[1]

[1]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis, Complex Jejawi 3, 02600 Arau, Perlis, Malaysia.

Abstract. The rapid development of poultry industry has correlated with increased production of keratin containing wastes that possessed complex morphology which difficult to degrade. UV irradiation pretreatment provide an initial stage of degradation before they are further degrade using fermentation process into ready to use protein. Untreated and treated with UV light chicken feathers morphology of fibers and cuticle cells were observed using SEM. A feather protein hydrolysate was produced by keratinolytic bacteria Bacillus subtilis under submerged fermentation. Keratinolytic kinetic is study using Michealis-Menten kinetics where Km value for treated chicken feathers with UV was 22.4591 M which is smaller compare to untreated chicken feathers, 42.3065 M. The smaller Km value shows tightly binding of keratinase and chicken feathers powder. Chicken feathers that were treated with UVC has the highest protein content about 3.19 mg/mL of protein while untreated chicken feathers only contains 2.29 mg/mL of protein.

Advantages Of Using Hybrid System Method In Industrialised Building System (IBS)

*Izzati Azmin[1], and Umar Kassim[1]

[1]Faculty of Civil Engineering Technology, University of Malaysia Perlis (UniMAP), 02100 Padang Besar, Perlis, Malaysia.

Abstract. Hybrid System method is one of the technology implements in Industrialised Building System (IBS). Methods has been acquaint in many ways in order to improve Industrialised Building System (IBS) in Malaysia. Other country such as United Kingdom also have used the term Hybrid for their concrete process known as Hybrid Concrete Construction (HCC). While in Malaysia, Hybrid System comes with a method that combines one component with two different method which are the precast component and cast-in situ method. This two combination method has called a Hybrid System method and started implements by Jabatan Kerja Raya (JKR) for mostly a government projects in Kedah state in Malaysia on 2017. Industrialised Building System has been well known as a fast completion, saving cost, and less labour needed in construction. However, the issues by using Hybrid System method has double up the time completion, splurging the cost, and enlarge the labour since it needs to cast-in situ the components, let the concrete cured and more material usage. Hence, this paper is to identify the advantages of using Hybrid System method in Industrialised Building System (IBS).

Microbiologically Influenced Corrosion Of Iron By Nitrate Reducing *Bacillus sp*.

M A F M Zaidi[1], *M N Masri[1], and S K Wee[1]

[1]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli Kelantan, Malaysia

Abstract. Iron has played a crucial role in the human ecosystem currently in transportation, manufacturing, and infrastructure. Iron oxide is known as rust, usually the reddish-brown oxide formed by iron and oxygen reactions in moisture from water or air. Microbiologically influenced corrosion (MIC) is a significant problem to the economic damage, especially in industrial sectors and its direct presence with nitrate/iron-reducing bacteria. This paper aims to explore the MIC of iron by nitrate-reducing Bacillus sp. including the redox reaction occurs, microbiologically influenced corrosion, iron/nitrate-reducing and mechanisms of microbial iron/nitrate reduction.

Multiple Responses Injection Moulding Parameter Optimisation Via Taguchi Method For Polypropylene-Nanoclay-Gigantochloa

*M S Rosli[1], M H Othman[1], Sri Yulis M Amin[1], and M A I Azman[1]

[1]Faculty of Mechanical and Manufacturing Engineering,Universiti Tun Hussein Onn Malaysia (UTHM), 86400 Parit Raja, Batu Pahat, Johor, Malaysia.

Abstract. Recently, injection moulding process is a major interest within the field of manufacturing technology because of the issue to archive the good quality of product while minimizing the defect of the product that has been produce. This research purpose describes the effects of multiple objective optimisation for injection moulding processing condition via Taguchi method towards multiple responses such as melt flow index, flexural strength, warpage, and shrinkage. The compounding material used in this research are polypropylene, nanoclay, the compatibilizer which is polypropylene graft maleic anhydride (PP-g-MA), and gigantochloa scortechinii which known as bamboo fibre. For comparison purpose, the contents of natural fiber selected are 0wt.%, 3wt.% and 6wt.% towards the processing condition which are packing pressure, melt temperature, screw speed and filling time. Based on the signal to noise ratio analysis results, the highest value of S/NQP is at 6wt.% which is 160.6451 dBi followed by 3wt.% (158.1919 dBi) and 0wt.% (134.8150 dBi). Furthermore, the most influential parameter changed with the existence of Gigantochloa Scortechinii from melt temperature into packing pressure. In conclusion, the optimum values for multiple response have been affected with the present of Gigantochloa Scortechinii.

Effect Of Extracted Microcrystalline Cellulose On PVA/ Microcrystalline Cellulose Biocomposite

Nur Aiman Mohamad Senusi[1], Rathesh Kumaran Ulaganathan[1], Norshahidatul Akmar Mohd Shohaim[2], Ahmad Zamani Ab Halim[3], Nurasmat Mohd Shukri[4], Mohamad Asyraf Mohd Amin[5], Abrar Ismardi[6], and *Nor Hakimin Abdullah[1]

[1]Advance Materials Research Centre (AMRC), Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli, Kelantan, Malaysia.
[2]Faculty of Applied Science, Universiti Teknologi MARA Pahang, Jengka Campus, 26400 Bandar Tun Abdul Razak Jengka, Pahang Malaysia.
[3]Faculty of Industrial Sciences & Technology, University Malaysia Pahang, 26300 Gambang, Kuantan, Pahang, Malaysia.
[4]School of Health Sciences, Universiti Sains Malaysia, Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia.
[5]Green Tech Enov, Lorong TJI 34, Taman Jengka Indah, 26400 Bandar Tun Razak, Pahang, Malaysia.
[6]Department of Engineering Physics, School of Electrical Engineering, Telkom University, Jalan Telekomunikasi No. 1 Terusan Buah Batu Bandung, West Java, Indonesia.

Abstract. In this study, microcrystalline cellulose (MCC) formed from oil palm (Elaeis guineesis) trunks (OPT) by using water-treated fibre and alkali bleaching techniques. The prepared MCC with different compositions (0.5wt%, 1.0wt% and 1.5wt%) was implemented as reinforcement in polyvinyl alcohol (PVA) matrix to form PVA/MCC biocomposite with glycerine as the plasticizer. The morphology of the extracted MCC was visualized using scanning electron microscopy (SEM) and X-ray diffraction (XRD). The effect of the MCC as biofiller in PVA matrices was studied using Universal Testing Machine. SEM result showed the rough surface and minor agglomeration of the MCC while XRD revealed the MCC was semi-crystalline with the crystallinity index of 48.7 %. The tensile strength of PVA/MCC biocomposites discovered the highest stress value obtained at 1.0wt% of MCC and followed by 1.5wt% and 0.5wt% with the value of 11.87, 10.07 and 9.88 MPA, respectively. It is found that the highest elongation break values of the PVA/MCC biocomposites at 54.93 mm (1.0wt% of MCC) and followed by 53.72 mm (0.5wt% of MCC) and 25.51 mm (1.5wt% of MCC).

Effect Of Cellulose Nanofibers (CNF) As Reinforcement In Polyvinyl Alcohol/ CNF Biocomposite

Rathesh Kumaran Ulaganathan[1], Nur Aiman Mohamad Senusi[1], An'Amt Mohamed Noor[1], Wan Nazwanie Wan Abdullah[2], Mohamad Asyraf Mohd Amin[3], Mohammad Khairul Azhar Abdul Razab[4], Abrar Ismardi[5], and *Nor Hakimin Abdullah[1]

[1]Advance Materials Research Centre (AMRC), Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli, Kelantan, Malaysia.
[2]School of Chemical Sciences, Universiti Sains Malaysia, Minden-Penang, 11800, Malaysia.
[3]Green Tech Enov, Lorong Tji 34, Taman Jengka Indah, Bandar Tun Razak, Pahang, 26400, Malaysia.
[4]School of Health Sciences, Universiti Sains Malaysia, Health Campus, 16150 Kubang Kerian, Kelantan, Malaysia.
[5]Department of Engineering Physics, School of Electrical Engineering, Telkom University, Jalan Telekomunikasi No. 1 Terusan Buah Batu Bandung, West Java, Indonesia.

Abstract. This research was targeted to use planetary ball milling method to extract cellulose nanofibers (CNFs) from a commercial microcrystalline cellulose, and also to utilize the obtained extracted cellulose nanofibers (CNFs) as a reinforcement in polyvinyl alcohol (PVA) thin film. To study the effect of cellulose nanofibers (CNFs) on mechanical and physical properties of polyvinyl alcohol (PVA) thin films. As a result of the study, we found that the tensile strength of the thin film is good and the surface morphology of the CNFs suspension enhances the bonding between the PVA and the reinforcement. Tyndall effect was accurate with the visible light scattering through CNF suspension and the CNF/PVA thin film exhibited transparent thin film. In contrast, the mechanical as well physical properties of CNF/PVA composite is good due to the well dispersion and absence of agglomeration of CNFs.

Effect of Different Yeast Extract Concentration in Membrane-Less Microbial Fuel Cell (ML-MFC) For Electricity Generation Using Food Waste as Carbon Sources

Nurul Najwa Adam Malik[1], Mohammad Mirza Mohammad Faizal[1], Husnul Azan Tajarudin[1], Noor Fazliani Shoparwe[2] and *Muaz Mohd Zaini Makhtar[1]

[1]School of Industrial Technology, Bioprocess Technology Division, Universiti Sains Malaysia, 11800 Penang, Malaysia
[2]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli, Kelantan, Malaysia

Abstract. Electricity is the basic energy in our daily life and there is about 14 % of global population that did not get the access to electricity. Furthermore, 45 % of the main composition of waste that produced daily is food waste. As a result, microbial fuel cell (MFC) becomes the solution as it has the potential for food waste treatment and electricity power generation. This study was conducted to utilize the food waste that collected from E-Idaman Sdn Bhd, Kedah, to generate energy while focusing the effect of different yeast extract level in a membrane-less microbial fuel cell (ML-MFC). The electrogenic bacterial culture that acted as a catalyst for electricity power generation was isolated from previous working ML-MFC. The proximate analysis of food waste revealed that carbon has the highest composition with 30.02 %. From the preliminary study that compared three different strains of electrogenic bacteria to introduced in the ML-MFC, Bacillus subtillis sp.showed the highest specific growth rate, μ, (0.117 g.L-1/h) and doubling time, Td, (5.93 h). The performance of the ML-MFC was evaluated using one-factor-at-a-time (OFAT) method. The highest voltage generation (820 mV) and power density (9576.14 mW/m2) were obtained in 5 g/L yeast extract concentration ML-MFC. The highest substrate degradation efficiency (12.3 %), COD removal (99 mg/L) and biomass (44.32 mg/L) were in 15 g/L yeast extract concentration ML-MFC. It showed that the additional of yeast extract concentration intofood waste inside the ML-MFC has boosted the efficiency of EB to growth well thus consumed more carbon source (removed COD value; bioremediation) in food waste.

Implementation of Hybrid Sine Cosine Algorithm for Input-Output Combinatorial Testing

*Jalal Mohammed Alkanaani[1] , Rozmie Razif Othman[2] , and R Badlishah Ahmad[2], Khin Maung Htay[2]

[1]Iraq University College, Computer Engineering Department, Basra, Iraq
[2]Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia

Abstract. Nowadays, software requirements are growing all the time, as software becomes part of our daily lives. Usually, software systems cannot perform exhaustive testing because of certain factors (i.e. budget and time limitations). Combinatorial Testing (CT) is an effective fault detection technique. In CT, early fault detection can be improved by ordering test cases based on input interactions and possible combinations of input can be used to find the software configuration fault. The efficiency of CT is detecting failures effectively which is triggered by the input interactions among the parameters. CT is proven to be efficient at generating test data to detect a product's fault because of the interaction between the product features(i.e. parameters and its values). Various strategies have been built to produce combinational test data to support Uniform Strength (US) and Variable Strength(VS) interactions. Unfortunately, there is a lack of input-output relations (IOR) support for these current strategies as there are only a few of them supports IOR. This paper proposes Sine Cosine Algorithm (SCA) based IOR strategy called Hybrid Sine Cosine Algorithm (HSCA). The experimental results show that HSCA can produce optimum results in many cases.

Biosensor Diagnostic System for Selective Detection of RNA Covid-19

*M.N. Afnan Uda[1], U. Hashim[1] and M.N.A. UDA[2]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia
[2]Faculty of Chemical Engineering, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia

Abstract. An outbreak of severe acute respiratory coronavirus 2 (SARS-CoV-2) infection occurred in Wuhan, Hubei Province, China and spread across China and beyond. WHO officially named the disease caused by the novel coronavirus as Coronavirus Disease 2019 (Covid-19). Features included pyrexia, radiological signs or acute respiratory distress, reduced or normal white blood cells, lymphopenia, and failure to resolve over 3 to 5 days of antibiotic treatment. This paper describes ultra-selective and rapid to detect the electrical signal generated by the biosensor that converts the biological reaction into an electrical signal and can make early RNA Covid-19 detection. As a step in preparing the biosensor, silanization with (3-Aminopropyl) Triethoxysilane (APTES), immobilization of RNA Covid-19 Probe were used. Then, the biosensor was hybridized to perform selectivity measurement using complementary and non-complementary RNA Covid-19 target.

Biosorption of Au(III) and Cu(II) by Chitosan Beads

Annestasia Ollat Anak Jampang[1] and *Siu Hua Chang[1]

[1]Faculty of Chemical Engineering, Universiti Teknologi MARA, Cawangan Pulau Pinang, Kampus Permatang Pauh, 13500 Permatang Pauh, Penang, Malaysia.

Abstract. This work aimed to study the biosorption of Au(III) and Cu(II) by chitosan beads. The effect of pH on the biosorption of Au(III) and Cu(II) by chitosan beads was investigated in single- and binary-metal solutions. It was found that the sorption percentage and capacity of chitosan beads for Au(III) and Cu(II) increased with pH from 1 to 3 and hit a plateau at pH 3 for single-metal solutions, while those for binary-metal solutions increased from 1 to 2 and hit a plateau at pH 2. A consideration separation of Au(III) from Cu(II) could also be achieved at pH 3-5.

Surface Morphological Analysis of Silica Nanoparticles Generated from Rice Straw Ash

*M.N.A.Uda[1,2], Subash C.B. Gopinath[1,2], Uda Hashim[1], M.N. Afnan Uda[2], N.A. Parmin[1], N.H. Halim[1] and Periasamy Anbu[3]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia.
[2]Faculty of Chemical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.
[3]Department of Biological Engineering, College of Engineering, Inha University, Incheon 402-751, Republic of Korea..

Abstract. The characteristics of surface morphology of silica nanoparticles are essential for determining the original properties. In this research, silica nanoparticle was generated from the fly ash of rice straw. Field-emission scanning electron microscopy (FESEM), field-emission transmission electron Microscope (FETEM), Energy-dispersive X-ray spectroscopy (EDX) and Atomic Force Microscopy (AFM) were used for observing the size and shape uniformity. Further, the surface elements were revealed and matched with other existing silica nanoparticles from fly ashes of other sources. The current results can be the model for comparing the silica nanoparticles from other sources.

Morphological Analysis of Fabricated 5.0 µM Interdigitated Electrode (IDE)

*M.N.A.Uda[1,2], Subash C.B. Gopinath[1,2], Uda Hashim[1], M.N. Afnan Uda[2], N.A. Parmin[1] and N.H. Halim[1]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia.
[2]Faculty of Chemical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

Abstract. The aim of this research is to study the morphological analysis of fabricated Interdigitated Electrode (IDE). This device electrode was physically characterized using 3D nano profiler, scanning electrode microscope (SEM), Energy-dispersive X-ray spectroscopy (EDX) and Atomic Force Microscope (AFM). Based on this analysis, IDE pattern was detailed and analyzed thoroughly based on IDE pattern with 5 µM finger gap.

Issues for Internet of Things (IoT) and Smart Home Technology in Malaysia

*S. Aziz[1] and S.N. Nasir[1]

[1]Faculty of Architecture and Ekistics, Universiti Malaysia Kelantan, Kelantan, Malaysia

Abstract. The capability of the Internet of Things (IoT) to electronically meter, path and monitor objects in the physical world has encouraged a flow of innovation and interest from many industries. It's probable to driving, chaotic changes across many sector offerings a myriad of potential services and applications. Smart home service, one of the symbolic developing technologies in the IoT era, has changed house equipment into being more intelligent, remote controllable, and interconnected. This paper is division of current the author's research on the adoption of IoT application for home building in Malaysia. The data and information presented in this paper were gathered from the reviews of the available relevant literature related to IoT and smart home in Malaysia. This paper addresses the major concern and challenges in IoT and smart home in Malaysia. Based on the analysis, it was found that three main challenges cited in the literature are perception of usefulness, confidentiality and privacy of consumer data, and absence of enterprise IoT applications in the country. As for Iot and smart home technology improvement in the near future, suggested tackling the current issues on home online education and working from home (WFH) especially because of the problematic pandemic Covid-19 worldwide.

Issues That Affect Construction Of Houses Which Relate To Healthy Environment

*S.N. Nasir[1], W.O. Ismail[2] and S. Aziz[1]

[1]Faculty of Architecture and Ekistics, Universiti Malaysia Kelantan, Kelantan, Malaysia
[2]Faculty of Innovative, Design and Technology, Universiti Sultan Zainal Abidin, Terengganu, Malaysia.

Abstract. Most rural houses in Malaysia are constructed from less durable materials and are poorly ventilated and lighted. Urban houses are also very much crowded and lack the basic sanitation facilities. The situation is worsened by the unplanned urbanization and rapid population growth. The aim of this research is therefore to highlight the issues that affect the construction of houses which relate to healthy environments. Thus, this is lead to healthier life style and also give more benefit to the homeowners. The results of this research can help decision makers to identify major issues construction of houses and build environmentally friendly construction plans in the early stages of construction.

A Parametric Study on Heat Generation and Temperature Distribution During Bone Drilling Process

*Muhammad Fadzlan Fathullah Suhaimi[1], Nur Saifullah Kamarrudin[1,2], Ruslizam Daud[1], Ishak Ibrahim[1,2], Khairul Salleh Basaruddin[1] and Fauziah Mat[1]

[1]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia
[2]Centre of Excellence Automotive & Motorsports (MoTECH), Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia

Abstract. Surgical bone drilling is used during bone replacements, such as internal and external fixation, in orthopaedic surgery. The friction between the workpiece and the drill-bit will produce heat during this process, which this heat will cause damage the surrounding bone, known as thermal necrosis. In this method, the main concern is to cut out a section of the bone to create a hole for the implant to be inserted without damaging the surrounding bone tissue. The latest experimental and theoretical work on one of the parameters influencing thermal responses during bone drilling. Therefore, the optimum range of drill-bit geometry and bone drilling parameter was defined in this analysis to reduce the undesirable problems that may arise because of thermal effects.

CFD Simulation on Improving Water Quality based on Various Aerator Models to Demonstrate Cost Performance Analysis

N. N. Norbashah[1], M. F. H. Rani[1], *N. S. Kamarrudin[1,2], A. B. Shahriman[1,2], Z. M. Razlan[1], 2, W. K. Wan[1,2], M. S. M. Hashim[1,2], I. Ibrahim[1,2], A. Rahman[1,2], Z. Ibrahim[3], M. K. Faizi[1,2], M. A. S. Hassan[1,2], A. A. Abd Manap[4] and I. F. Zainuddin[4]

[1]Faculty of Mechanical Engineering Technology, Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[2]Centre of Excellence Automotive & Motorsports (MoTECH), Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[3]Department of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Brunei, Jalan Tungku Link, Mukim Gadong A, BE1410 Brunei Darussalam
[4]Department of Irrigation and Drainage Perlis, JPS Perlis Complex, Pengkalan Asam, 01000 Kangar, Perlis, Malaysia

Abstract. There are many types of aerator that can be used to perform a water treatment process either from air to water or from water to air approaches. Other than focusing on the performance itself, the usage cost of aerator should be forecasted in detail too to have a sustainable and economical method in remediating the polluted water. Therein, the cost performance analysis was demonstrated by performing a computational fluid dynamics (CFD) simulation on improving water quality based on various aerator models. The simulation was focused in a small-scale aeration tank that consists of a mixing chamber, air duct, and a few of bubble diffusers. The improvement of water quality was assessed by calculating the number of gas bubble particles produced by 4 different configurations of aerator model. Results found that the aerator model D produces the highest number of gas particles up to 72.2%. However, the aerator model C was found to achieve the most efficient and sustainable approach based on energy consuming and cost of aerator configuration when compared to the other aerator models.

Development of a Novel Aeration Measurement System to Evaluate Water Treatment Process in a River

M. F. H. Rani[1,2], *N. S. Kamarrudin[1,2], A. B. Shahriman[1,2], Z. M. Razlan[1,2], W. K. Wan[1,2], M. S. M. Hashim[1, 2], I. Ibrahim[1,2], A. Rahman[1,2], Z. Ibrahim[3], M. K. Faizi[1,2], M. A. S. Hassan[1,2], A. A. Abd Manap[4] and I. F. Zainuddin[4]

[1]Faculty of Mechanical Engineering Technology, Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[2]Centre of Excellence Automotive & Motorsports (MoTECH), Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[3]Department of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Brunei, Jalan Tungku Link, Mukim Gadong A, BE1410 Brunei Darussalam
[4]Department of Irrigation and Drainage Perlis, JPS Perlis Complex, Pengkalan Asam, 01000 Kangar, Perlis, Malaysia

Abstract. A novel aeration measurement system was developed to evaluate the water treatment process in a river to acquire a more comparable dissolved oxygen value even if various types of aerations are tested. The system comprises of DO sensor, water flowmeter, anemometer, PVC pipes, water pump, air compressor pump, and truck tyre tubes. The PVC pipes consisting of a main drainage hole, 5 holes for dissolve oxygen data collection, 1 hole as the location of aerator system, and connectors were designed as the major part of the system by using Computer Aided Design software. The main drainage hole (horizontal pipe) was designed to be 288.5 cm in length, while the measured holes (vertical pipes) were designed to be 45.7 cm in height. By considering a systematic approach, the designed system is hopefully able to solve measuring issue of dissolved oxygen in moving water and to provide a better evaluation of water treatment process.

Effect of Current Density and Bath Temperature to The Corrosion and Wear Behaviour of Tungsten Carbide - Nickel Electrodeposition Coating

Natasha Alina Hamidi[1],*Zakiah Kamdi[1], Ainun Rahmahwati Ainuddin[1], Rosniza Hussin[2] and Siti Aida Ibrahim[2]

[1]Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, Malaysia.
[2]Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Hab Pendidikan Tinggi Pagoh, KM 1, Jalan Panchor, 84600 Panchor, Johor, Malaysia

Abstract. The composite (ceramic-metal) coating has become a desired coating due to their higher wear and corrosion behaviour compares to metal coating only. This study focus on the effect of the deposition parameter which is the current density and bath temperature to the corrosion and wear behaviour of the coating. The mild steel was used as the substrate and nickel-tungsten carbide (Ni-WC) as the coating. The Watts's bath was used as electrolyte with the addition of 25 g/l WC. 0.2 A/cm2 and 0.5 A/cm2 has been chosen as the current density while 30 oC and 50 oC as its temperature. The coating was characterised using a scanning electron microscope (SEM) and x-ray diffractometer (XRD). Immersion test and weight loss test was used to evaluate the corrosion and wear behaviour respectively. The 3 g/l silicon carbide was used as abrasive materials in the wear testing. Vickers micro-hardness tester was used for hardness property evaluation. It is found that higher current density and higher bath temperature results in lower corrosion and wear rate which shows higher resistance.

Improvement of Dissolved Oxygen in Perlis River based on Various Aeration Systems

M. F. H. Rani[1, 2], *N. S. Kamarrudin[1, 2], A. B. Shahriman[1,2], Z. M. Razlan[1,2], W. K. Wan[1, 2], M. S. M. Hashim[1, 2], I. Ibrahim[1, 2], A. Rahman[1, 2], Z. Ibrahim[3], M. K. Faizi[1, 2], M. A. S. Hassan[1, 2], A. A. Abd Manap[4] and I. F. Zainuddin[4]

[1]Faculty of Mechanical Engineering Technology, Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[2]Centre of Excellence Automotive & Motorsports (MoTECH), Pauh Putra Campus, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[3]Department of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Brunei, Jalan Tungku Link, Mukim Gadong A, BE1410 Brunei Darussalam
[4]Department of Irrigation and Drainage Perlis, JPS Perlis Complex, Pengkalan Asam, 01000 Kangar, Perlis, Malaysia

Abstract. Water pollution is closely related to the Water Quality Index (WQI). One of the parameters in classifying WQI is dissolved oxygen (DO) that can be improved by introducing the surface and subsurface aerations. Herein, the Perlis River's water quality was investigated by evaluating the DO's improvement based on various aeration systems. The changes of DO (mg/L) and DO improvement (%) were evaluated during both low and high tide conditions. A total of 9 sets of data collection had been studied by comparing base DO (without running of aeration) and measured DO (with running of aeration) of river. The DO sensor was used to measure the changes of DO in the aeration measurement system. Results found that the DO improvement managed to achieve 74.89%, 10.18%, 35.58%, and 52.45% for water jet, air compressor, commercial venturi, and DIY venturi, respectively. Besides, different behaviour of DO's improvement was observed during low and high tide conditions.

Monitoring Study for Construction Site Using UAV Photogrammetry

*N.M. Zahari[1], Mohammad Arif Abdul Karim[1], M.H Zawawi[1], Daud Mohamad[1], F. Nurhikmah[2] and Nurhanani A. Aziz[2]

[1]Department of Civil Engineering, College of Engineering, Universiti Tenaga Nasional (UNITEN), 43000, Kajang, Selangor, Malaysia
[2]UNITEN R&D Sdn Bhd, Universiti Tenaga Nasional (UNITEN), Kajang 43000, Selangor Darul Ehsan, Malaysia

Abstract. Unmanned aerial vehicles (UAV), commonly known as drones, are a perfect illustration of revolutionary equipment where it can now be used in geographical mapping instead of ground surveying and expensive traditional photogrammetry. The paper deals with the 3D model reconstruction of the new construction building. A complete aerial mapping of the area was carried out through the combination of aerial data collected with UAV and terrestrial data obtained with close-range photogrammetry techniques. The data acquired were then processed using digital photogrammetric software. This technique uses a sequence of 2-dimensional images to recreate a scene or an object's 3-dimensional structure. Combination of UAV and image processing can be used as a viable alternative to data collection to create 3D modelling of buildings or areas collected from aerial and terrestrial data. The results show the possibility of UAV technology for fast and reliable building 3D reconstruction to monitor the construction site.

Development of High Entropy Alloy (HEA) as Catalyst for Azo Dye Degradation in Fenton's Process

*Nur Hudawiyah Abu Hassan[1] and NorHuda Hidayah Nordin[1]

[1]Department of Manufacturing and Materials Engineering, International Islamic University Malaysia, Jalan Gombak, 53100 Kuala Lumpur, Malaysia

Abstract. Azo dyes represent the by far most important textile dyes used in the textile industry. However, it becomes a continuous source of environmental pollution due to its carcinogenicity and toxicity. Various methods had been used to remove azo dye in solution. One of the famous and repeatedly used is Fenton's process. The Fenton's process is one of the advanced oxidation process where iron catalysed hydrogen peroxide to generate hydroxyl radical. Treating azo dyes in solution requires a catalyst to enhance the process of degradation. Herein, high entropy alloy (HEA) has been proposed as a catalytic material to enhance the performance of Fenton process for azo dye degradation. HEA has been reported as a promising catalyst due to its high surface area. The higher the number of active sites, the higher the rate of azo dye degradation as more active sites are available for adsorption of azo dyes. The results have shown that HEA can be used as a catalyst to fasten the Fenton's reaction since the degradation time is proven to be shorter in the presence of HEA. The method derived from the result of this study will contribute in treating azo dyes for wastewater management in Fenton's process.

Effects of fertilizers and pesticides used in palm oil plantation on nearby surface water quality

*Azra Munirah Mat Daud[1,2] , Muhammad Firdaus Rosdi[1], Zawawi Daud[1,2], Mohd Baharudin Ridzuan[1,2], Mohd Arif Rosli[3] , Wesam Al Madhoun[1,2] and Izat Yahya[4]

[1]Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia
[2]Advanced Waste Recovery and Air Studies (AWRAS), Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia
[3]Faculty of Engineering Technology, University Tun Hussein Onn Malaysia
[4]Centre for Diploma Studies, Universiti Tun Hussein Onn Malaysia

Abstract. Sembrong River is one of the surface water resources used as water intake for treated domestic water supply in Batu Pahat, and often had water quality problem due to issues regarding pesticides and fertilizers from agricultural activities around the river. This study is focusing on the consequences of fertilizers and pesticides that have been used in palm oil plantation nearby the stream. The study aims to characterize the surface water in terms of physicochemical parameters, and analyse the effects of fertilizers and pesticides on surface water quality through selected anions concentrations. In-situ measurement was conducted using HANNA Multiparameter meter and Eco Sounder, to obtain the pH, temperature, dissolved oxygen and water depth at the selected points. Water samples were brought to the laboratory for further analyses on nitrate, nitrite, orthophosphate, chloride and sulfate concentration using Ion Chromatography. Results revealed that the surface water was in acidic condition, dissolved oxygen was between Class II and III. Overall temperature was recorded within the range of 27.6- and 31.0-degree Celsius. Water depth ranged between 1.0 m and 3.2 m. Sulfate concentrations ranged between 38.9 and 352.0 mg/L, while chloride concentrations ranged between 26.5 and 330.1 mg/L. Increasing concentration of sulfate and chloride resulted in decreasing pH of the surface water.

Numerical and Physical Model Study related to the Ogee Dam: A Review

*N. M. Zahari[1], M.H. Zawawi[1], L. M. Sidek[2] and Aizat Abas[3]

[1]Civil Engineering Department, College of Engineering, Universiti Tenaga Nasional, 43000 Kajang, Selangor, Malaysia
[2]Institute of Energy Infrastructure, Universiti Tenaga Nasional, 43000 Kajang, Selangor, Malaysia
[3]School of Mechanical Engineering, Engineering Campus, Universiti Sains Malaysia, 14300 Nibong Tebal, Pulau Pinang, Malaysia

Abstract. Ogee dam spillway is one of the cheapest, yet the most effective spillway design used in dams worldwide. It has an "S" shape profile with a varying gradient, along with its profile. With sedimentary materials used to construct ogee spillway, it is prone to soil erosion, and the 'S' shape also causes rapid energy dissipation. Various studies were done to investigate the spillway shape such as adding L-section sluice on its stilling basin, numerical studies on the spillway's flow structure, surface roughness, stabilize a hydraulic jump rate and discharge capacity based on its curvature. These review paper compile a building a scale model of the ogee spillway in the study, numerical method i.e. finite method (FEM), computational fluid dynamics (CFD) and artificial neural network (ANN). The results show that while the physical experimental study is still the standard numerical methods have improved tremendously in its accuracy, therefore discovering possibilities study to improve ogee dam spillways in a more widely and comprehensive.

Sol-Gel Deposited of Nanostructured Zinc Oxide (ZnO) Thin Films

*Rosniza Hussin[1,3] ,Fadhil Hanafi[2], Razlin Abd Rashid[1], Zawati Harun[2,3], Zakiah Kamdi[2], Siti Aida Ibrahim[1,3] and Ainun Rahmahwati Ainuddin[2]

[1]Department of Mechanical Engineering Technology, Faculty of Engineering Technology, Universiti Tun HusseinOnn Malaysia, alan Edu Hub Gunasama 1, Pagoh Edu Hub, KM1, Jln Panchor, 84600, Pagoh Johor, Malaysia
[2]Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, Parit Raja, 86400 Batu Pahat, Johor, Malaysia.
[3]Integrated Material and Process, Advanced Manufacturing & Materials Centre, Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, Parit Raja, 86400 Batu Pahat, Johor, Malaysia.

Abstract. Zinc Oxide (ZnO) have great potential due to the special characteristic of transparency, high electron mobility, wide bandgap, and strong room-temperature luminescence that makes it demanded material for electronic, photovoltaic and optoelectronic application. Nanostructured ZnO thin films grown using sol-gel method. The ZnO sol-gel were produced from zinc acetate dehydrate as the starting material with iso-propanol alcohol as the stabilizer where the ratio were controlled, distilled water and diethanolamine as the solvent mixing on magnetic stirrer for an hour under constant heat of 60˚C. The ZnO thin film deposited using the technique of spin coating with speed of 3000rpm for 30 minute before the sample undergo pre-heat in oven at the temperature of 100˚C for 10 minutes. The sample were annealing in the furnace for an hour at 200˚C, 350˚C and 500˚C. The X-ray diffraction (XRD) hexagonal wurtzite structure with composition of zincite and zinc acetate hydroxide hydrate. The surface roughness of the thin films were analyse using atomic force microscope (AFM) and scanning electron microscope (SEM) were used for surface and grain boundary observation and then, the ultra-violet visible microscope (UV-Vis) used to measure the transmittance percentage and bandgap for each of the sample ranging between three temperature and two solution.

Strength Development of Concrete Containing Municipal Solid Waste Incineration Bottom Ash and Metakaolin

*Roshazita Che Amat[1,3], Khairul Nizar Ismail[1,2], Norlia Mohamad Ibrahim[1,3], Nur Liza Rahim[1,3] and Wong Jin Loong[1]

[1]School of Environmental Engineering, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia.
[2]Center of Excellence Geopolymer and Green Technology, School of Material Enginering, Universiti Malaysia Perlis, Komplek Pengajian Jejawi 2, 02600 Arau, Perlis.
[3]Sustainable Environment Research Group (SERG), Center of Excellence Geopolymer and Green Technology, School of Material Enginering, Universiti Malaysia Perlis, Komplek Pengajian Jejawi 2, 02600 Arau, Perlis, Malaysia.

Abstract. The study was related to the influence of the properties of concrete by using different percentage of metakaolin and fixed percent of bottom ash to partially replaced the cement. Cement is a well-known building material and used for the construction in the world. Moreover, the used of metakaolin (MK) and bottom ash (BA) in concrete has received considerable attention in recent years. By using bottom ash, it could reduce the land filling space. X-Ray Fluorescence (XRF) test was used to determine the chemical composition of bottom ash and metakaolin. Four series of concrete have been examined, including control, bottom ash and metakaolin were used as partial replacement for cement at 10%BA + 10%MK, 10%BA + 15%MK and 10%BA + 20%MK of concrete mixes by volume. The curing period for the samples are 7 days and 28 days. In order to determine the properties of concrete, the tests such as slump test, density test, water absorption test, pulse velocity test, rebound hammer test and compression test were performed. The results proved that the strength development of 10%BA + 10%MK concrete sample shows the highest compressive strength after 28 days curing.

Waste Mussel Shell Utilization as an Alternate Adsorbent for the Removal of COD and Ammoniacal Nitrogen in Stabilized Leachate

*Zawawi Daud[1], Amir Detho[1,2], Halizah Awang[3], Mohd Arif Rosli[4], Mohd Baharudin Ridzuan1, Azra Munirah Mat Daud[1], Izat Yahya[5] and Wesam Al Madhoun[1]

[1]Advanced Waste Recovery and Air Studies (AWRAS), Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia
[2]Energy & Environment Engineering Department, Quaid-e-Awam University of Engineering, Science & Technology, Nawabshah, Sindh, Pakistan.
[3]Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia.
[4]Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia.
[5]Centre for Diploma Studies, Universiti Tun Hussein Onn Malaysia.

Abstract. Natural, agricultural, and industrial waste materials sources are available locally can be used as cost effectiveness adsorbent. The abundant natural source of waste mussel shell (WMS) is the benefit of using as the low-cost adsorbent for wastewater treatment as the base material. WMS is produced by the seafood industry. The disposal techniques of WMS practices pose a major concern for the environment. This research study emphases the evaluating WMS as such an effective adsorbent material to minimize the use of commercial adsorbent such as activated carbon (AC) and zeolite (ZEO) for pollutant removal from stabilized landfills. The two main pollutants in landfill leachate were known as chemical oxygen demand (COD) and ammoniacal nitrogen (NH3-N). WMS were used as a single adsorbent for landfill leachate treatment. Static batch experiment was performed with preparation of 100 mL volume of leachate samples with dosages of (2.5, 7.5 and 12.5 grams) respectively. The solution is then shaking incubator with 200 rpm shaking speed, pH of 7 and 120 minutes of contact time. The different dosages of WMS substantially influenced the removal of contaminants. Both parameter such as COD and NH3-N showed higher removal percentage at the dosage of 7.5g with removal percentage of 71% and 47% respectively.

Membrane-less microbial fuel cell: Effect of pH on the electricity generation powered by municipal food waste

Nurhazirah Mohd Azmi[1], Nadira Anandita[1], Husnul Azan Tajarudin[1], Noor Fazliani Shoparwe[2] and *Muaz Mohd Zaini Makhtar[1]

[1]School of Industrial Technology, Bioprocess Technology Division, Universiti Sains Malaysia, 11800 Penang, Malaysia
[2]Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli, Kelantan, Malaysia

Abstract. Fossil fuels have supported the industrialization and economic growth of countries during the past centuries and it is clear that they cannot indefinitely sustain in a longer time. In this study, membrane-less microbial fuel cell (ML-MFC) had potential solution to generate electricity power and at the same time could reduce the abundant of food waste (1.64 kg/daily, around8 tonnes/year) which dumped in the landfill. The ML-MFC operated electrochemically incorporate electrogenic bacteria (EB) acted as a biocatalyst in order to produce electricity. The performance of the ML-MFC using food waste is evaluated using one-factor-at-a-time (OFAT) method. The optimization performance of the ML-MFC using food waste was evaluated using method of one factor at one time (OFAT) and it was focused to pH for power generation. To determine the generated electricity the polarization curve was used to evaluate the performance of ML-MFC. The chemical oxygen demand (COD) of food waste was studied. Optimization of pH condition in ML-MFC ranging from 5 to 9. Results showed that pH 8 was the optimum pH for electrogenic bacteria (EB) strain, Bacillus Subtilis, with the high voltage generated (807 mV), EB biomass (35.46 mg/L), and power density (373.3 mW/m2). Clearly the pH environment condition affected the efficiency of ML-MFC performance. The increase in EB biomass also increased the voltage in the ML-MFC, proving that EB biomass and voltage were associated with growth.

Performance of ionic ultrafiltration polyethersulfone (PES) membrane for humic acid (HA) removal

Amalin Sofia Che Miur[1], *Noor Fazliani Shoparwe[1], Mardawani Mohamad[1], Nurul Akmar Che Zaudin[1], Muaz Zaini Makhtar[2] and Mohd Zaki Umar[3]

[1]Faculty of Bioengineering and Technology, Jeli Campus, Universiti Malaysia Kelantan,17600 Jeli Kelantan, Malaysia.
[2]Bioprocess Technology Division, School of Industrial Technology, Universiti Sains Malaysia, 11800 Pulau Pinang, Malaysia.
[3]Malaysian Nuclear Agency, 43000 Kajang Selangor, Malaysia

Abstract. The interest in ionic liquids (IL) has grown by its unique properties, such as negligible vapor pressure, thermal stability, wide electrochemical stability window, and tunability of properties. In this study, miscible IL namely Aliquat 335 with different composition of polyethersulfone (PES) and and Dimethyl acetamide (DMAC) as a solvent were used to fabricate the ionic ultrafiltration membrane by using dry-wet phase inversion technique. The effect of the composition PES on the properties and HA removal performance of ionic ultrafiltration membrane was investigated in this study. The properties of ionic ultrafiltration membranes such as surface morphology, hydrophilicity and functional group were characterized through Scanning Electron Microscopy (SEM), Fourier transform infrared spectroscopy (FTIR) and Water Contact Angle analysis. The performance of the fabricated membrane was analyzed based on water flux, HA flux, HA rejection and fouling analysis. The newly developed ionic membranes will be expected to achieve high HA removal and can be used as ultrafiltration membranes for the separation and concentration of macromolecules.

Healthcare in Sustainable Development Goals (SDGs): Using Kano to Ascertain Priorities

Harshita Aini Haroon [1,2,4,5], *Norshahrizan Nordin[2,4,5], and Nur Atiqah Dullah[2,3]

[1]Centre for Liberal Sciences, Universiti Malaysia Perlis, Malaysia.
[2]Faculty of Applied and Human Sciences, Universiti Malaysia Perlis, Malaysia.
[3]Unifield International College, Malaysia.
[4]Centre for Strategy and Quality Management, Universiti Malaysia Perlis, Malaysia.
[5]Centre of Excellence for Social Innovation and Sustainability, Universiti Malaysia Perlis, Malaysia.

Abstract. SDGs are aimed at achieving global peace and prosperity by 2030. As such it is important that everyone works towards contributing to their achievement. Given that there are 17 SDGs in total, ineffective organisational strategic implementation may result from isolated and insufficient treatment of SDG requirements. A key agenda found in all the SDGs is healthcare which sets out to safeguard and promote the health and well-being of global citizens. This paper presents a suggestion of implementation priorities for Malaysian hospitals in support of the SDGs. As a first step, elements of healthcare in all the SDGs were identified. Then, based on the healthcare elements, specific SDGs in which they are found were mapped to the relevant 5P's (People, Planet, Prosperity, Peace, Partnership). Using Kano (Theory of Quality Attributes), the mapping guided the development of a questionnaire which was then distributed to 92 outpatients of three Malaysian public hospitals. Data reveals that the top three high functionality levels are *"Provide good services in the healthcare sector"* (functionality level of 0.7500), *"When the environment improves, health status will improve too"* (0.7209), and *"Respect each other's different opinions, ethnicity, origin, religions, different backgrounds and gender"* (0.6742). Conversely, the top three dysfunctionality levels are items *"The government, civil society and communities work together"* (-0.6000), *"Country provides good services in health care sector"* (-0.5761) and *"Responsibility to avoid harm towards the environment and planet"* (-0.5517). Overall, the results point to specific action items and 5Ps that organizations can strategize and focus on to effectively contribute to the achievement of healthcare goals set out in the SDGs.

Development of Wireless Lighting via Magnetic Resonance

*Mohd Zamri Hasan[1], Roslina Abdul Rahim[1], and Chanuri Charin[1]

[1]Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis, Kampus Alam UniMAP, Pauh Putra, 02600 Arau, Perlis, Malaysia.

Abstract. Wireless Power Transfer (WPT) is an efficient method for the diffusion of electricity from one place to another place through the air without the use of any physical support. Using WPT, electricity can be transmitted by using electromagnetic radiation for short range, resonant induction for mid-range, and microwave power transfer for long distance. Parameters and design of the electromagnetic coupling transmitter and receiver component is important to deliver sufficient light-emitting diode (LED) lamp. In this project, the aim is to simulate a transmitter circuit and receiver circuit for WPT via magnetic resonance using the Proteus software. Insulated copper wire is used in this project to develop a magnetic resonance for wireless power transfer. Plus, the functionality of the prototype is tested in terms of distance and diameter. The functionality of the WPT system is tested by a 3W power rating prototype. The results show that the WPT system is functioning well as Led is light up. Besides, the influence of the coils' distance and diameter is also discussed. The results show that the distance and diameter of coils play an important role in transmitting power.

Crowd Emergency Evacuation Simulation Time Analysis via Obstacle Optimization Strategy

*S. Hamizan[1], S. Roselina[2], and H.Habibollah[3]

[1,2,3]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia.
[1]Faculty of Computer Science and Information Technology, Universiti Malaysia Sarawak.

Abstract. The crowd evacuation simulation is essential to provide important results for occupants especially in large capacity building compared to human fire drill exercise. The evacuation simulation is essential for human safety. The strategy of evacuation such as the use of obstacle may need to be adapted by many organization as an aid to help in visualizing and estimating the evacuation time during emergency. During certain crowd event, they may consider various setting of object to ensure smoothness and effective crowd evacuation flow. In this paper, it aims to provide the simulation with 100-1000 agents and testing with obstacle using Anylogic tool and analysis of evacuation time validated using SPSS. The results shows that the placement of obstacle near exit way indeed can reduce the evacuation time and complies to anti-arching phenomenon during evacuation.

Direct Current (DC) Motor Speed and Direction Controller

Nurshahirah Shaharudin[1], *Mohd Zamri Hasan[1], and Syatirah Mohd Noor[1]

[1]Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis, Kampus Alam UniMAP, Pauh Putra, 02600 Arau, Perlis, Malaysia.

Abstract. Direct current motor is an important drive configuration for many applications across a wide range of power sand speeds. It have variable characteristics and used extensively in variable-speed drives. The goals of this project are to control the direction and speed of Direct Current (DC) motor. Due to the advancement of wireless technology, there are several communication devices introduced such as GSM, Wi-Fi, ZIGBEE and Bluetooth. Each of the connection has their own unique specification and application. Among these wireless connections, Bluetooth technology is often implemented and can be sent from the mobile phone from the distance of 10 meter. The speed control was implemented using Bluetooth technology to provide communication access from smart phone. Instead, the ARDUINO UNO platform can be used to quickly promote electronic systems. An electronics technique called Pulse Width Modulation (PWM) is used to achieve the speed control and this technique generates high and low pulses then these pulses vary the speed in the motor. In order to control this PWM pulse, variable resistors are used and depend on it the speed of DC motor will increase or decrease. The variable resistor is adjusting to vary the speed of the motor and the higher the resistance the lower the speed of the motor rotates. The direction of the motor are controlled by the relay when give a command on the virtual terminal. The speed of the motor is directly proportional to the resistance as the speed increased after the resistance also increased and vice versa. This project is practical and highly feasible in an economic point of view and has an advantage of running motor at higher rating in term of reliable, durable, accurate and efficient way of controlling speed and direction control.

Synthetic Data and Reduction Method to Enhancing Prediction in Svm to Imbalanced Data Classification Problem

*Hussein Ibrahim Hussein[1] and Said Amuril Anwar[1]

[1]Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis, Kampus Alam UniMAP, Pauh Putra, 02600 Arau, Perlis, Malaysia.

Abstract. Class-imbalanced problem make the classifier more concerned compared to the minority, as the quantity of majority-class samples is more compared to the minority-class, and data redundancy issue triggers poor classification results as some duplicate combinations cause an unfavourable effect on process of classification. The class-imbalanced classification problem is observed in several domains, like healthcare and bioinformatics. Several academics scrutinise either the issue of duplicates or class imbalances and present a suite of algorithms; however, they disregard the two issues together, and this indicates that issues impact class-imbalanced classification mechanisms. In this research, a novel methodology known as GDSS-RS-SVM is presented, intended at class-imbalanced datasets. This enhances SVM by accounting for the class imbalanced problem and making the classes balanced by producing synthetic data sets centred on every feature in the minority class, thus making the process more precise. A method is suggested centred on the notion of the rough set theory for eliminating data redundancy cases. It also enhances decision making and estimation for SVM. Lastly, the experiment results specify that this method is extremely effective.

Abaqus Simulation on Basalt Fibre Reinforced Polymer Epoxy Tube Subjected to Axial Compression for Energy Absorption

*Vinu Sivakumar[1], Martin Mattioni[2], and Nawawi Chouw[1]

[1] Department of Civil and Environmental Engineering, Auckland, New Zealand.
[2]Mechanical Engineering Department, UTBM, France.

Abstract. The study focuses on the energy absorption characteristics of basalt fibre reinforced polymer epoxy tube (BFRPE) subjected to axial compression. Fibre reinforced polymer (FRP) technology is implemented as outer jackets in structural elements such as column, beam and as light weight components as head liners in car, brake pads and energy absorber in automobile engineering. The research aims to provide a recyclable, natural, low-cost energy absorption material capable of increasing the load bearing capacity of the structure. The failure modes of the specimens were analysed from Abaqus. The energy absorption, crush force efficiency are discussed. The test results indicate that the number of layers of fabric increases the load bearing capacity and the energy absorption of the tube.

Designing Specific SARS-CoV-2 DNA Probe as Biosensing Element for Development of Biosensor

F. Syakirah Halim[1], *N. A Parmin[1], Uda Hashim[1,2], Subash C.B Gopinath[1] Farrah Aini Dahalan[3], Iffah Izzati Zakaria[4], Wei Chern Ang[5], and N. Fareezah Jaapar[1]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia. [2]School of Microelectronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia.
[3]Faculty of Civil Engineering, Universiti Malaysia Perlis, 02600, Arau, Perlis, Malaysia.
[4]Malaysia Genom Institute (MGI), National Institute of Biotechnology (NIBM), 43000 Kajang, Selangor, Malaysia.
[5]Clinical Research Centre, Ministry of Health Malaysia, Hospital Tuanku Fauziah Perlis, 01000 Kangar, Perlis, Malaysia.

Abstract. Severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) is a part of the family of beta-coronaviruses inducing COVID-19 disease. Covid-19 became the most life-threatening and highly contagious viral disease compare to another disease family of coronavirus. Right now, the RT-PCR is the gold standard for the diagnostic of COVID-19. To produce successful prevention strategies, medical testing, vaccinations, and antiviral drugs against COVID-19, comprehensive biological information is critical. Conserved coding RNA sequence within the N gene region of the open reading frame in the SARS-CoV-2 genome was employed as the foundation for creating an oligonucleotide probe to identify the virus. Studies were conducted on various strains of coronavirus sequences to verify the percent of correlation as well as the region of consensus that triggers various strains of viruses. Basic local alignment search tools (BLAST) and CLUSTLW had devoted additional statistical parameters, for example, desire values (E-values) and score bits. The 30 mer DNA probe with 50.0% of GC content was developed, CTG AAG CGC TGG GGG CAA ATT GTG CAA TTT. The adequate length of the probe is between 22 and 31 mer. The complementary DNA probe was designed based on the RNA target from the N-region selection that has been identified that could be used as a biomarker probe to produce a biosensor that can be implemented to the clinical and environmental diagnosis of COVID-19.

The Sound Absorption Coefficient of Railway Concrete Sleepers Containing Palm Oil Fuel Ash (Pofa) as a Cement Replacement Material

Nurfarhanna Ahmad Sulaiman[1], *Suraya Hani Adnan[2], Mohamad Hairi Osman[2], Mohamad Luthfi Ahmad Jeni[2], Wan Amizah Wan Jusoh[2], Zalipah Jamellodin[3], Noor Azlina Abdul Hamid[3], and Norhafizah Salleh[3]

[1]Department of Transportation Engineering Technology, Faculty of Engineering Technology, University Tun Hussein Onn Malaysia, Branch Pagoh, 84600 Pagoh, Johor, Malaysia.
[2]Department of Civil Engineering Technology, Faculty of Engineering Technology, University Tun Hussein Onn Malaysia, Branch Pagoh, 84600 Pagoh, Johor, Malaysia.
[3]Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia, Parit Raja 86400, Batu Pahat, Johor, Malaysia.

Abstract. The noise and vibration of concrete sleepers during train operation cause annoyance to the passengers inside the train and the residents along the railway line. Meanwhile, in 2020, approximately 100 million tons of palm oil fuel ash (POFA) was disposed of which causes a burden to the landfill. However, POFA contains high silica content and porous particles which indicated its pozzolanic properties and sound absorption characteristics. Therefore, the purpose of this study was to determine the sound absorption coefficient of POFA as a cement replacement material, aiming to produce lower noise concrete sleepers. Concrete sleepers with a strength grade of 55 and a w/c ratio of 0.35 were prepared in this study. Three design mixes with 0% (control), 20%, and 40% of POFA tested by using an impedance tube test at 28 days of curing age. Based on the results, the sound absorption coefficient and noise reduction coefficient increases as the percentage of POFA increase. The highest performance was recorded by concrete sleepers containing 40% of POFA, with a recorded sound absorption coefficient of 0.10 for low frequency and 0.44 for high frequency. Meanwhile, the noise reduction coefficient recorded was 0.33, which reduce 32% of noise compared to OPC.

A Review of Optimization Algorithms in SVM Parameters

*Hussein Ibrahim Hussein[1] and Said Amuril Anwar[1]

[1]Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis, Kampus Alam UniMAP, Pauh Putra, 02600 Arau, Perlis, Malaysia.

Abstract. The SVM is a widely known machine learning, which is very useful for regression applications and pattern classification. These machines have been used successfully in several domains to address numerous real-world challenges. In this context, parameter optimisation for an SVM is a widely researched topic, which has attracted attention from several research domains. Algorithms facilitating optimisation have been of greater interest compared to other algorithms. Algorithmic approaches allow the optimal parameters for an SVM to be determined, after which the model can be adapted for several other applications. During the last two decades, several enhancements have been brought about to facilitate better optimisation of SVM models to offer enhanced performance. This paper focuses on the several algorithms currently employed to optimise support vector machines in their basic and modified forms. This paper comprises a comprehensive analysis of algorithms and aims to ascertain the present challenges relating to algorithms used for SVM parameter optimisation. This study cannot evaluate all the details; however, the significant theoretical aspects are covered using references to existing literature.

A Review: Calcium Carbonate ($CaCO_3$) extract from natural ceramics for thin film application

Nursyazwani Zulkefli[1], Eliza M. Yusup[1], and Mohd Hilmi Othman[2]

[1]Bioactive Material (BIOMA), Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Johor, Malaysia.
[2]Advanced Forming Research Group (AFRG), Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Johor, Malaysia.

Abstract. $CaCO_3$ are widely used as one of the main materials in bone tissue engineering. The biodegradable material used is thin films and has been widely recognized as a prospective approach to altering a biomaterial's surface properties. Ideal thin films must be able to imitate mechanical and biological properties besides being able to support the growth of large tissue constructions. Different uses of procedures, tools and processing requirements have led to the development of several layer-by-layer assembly techniques that widely used in porous membranes, particles and biological matters. Employing new ways of nature-based materials such as mineral products extracted from $CaCO_3$ has caused the increasing demands of natural materials that can be easily fulfil by using cockle shells, eggshells, or fish scales as main sources as well as due to their availability and low cost. The thin film in this research is expected to get incorporated at bone surfaces to control tissue-biomaterial interaction and have mechanical properties that are similar to the soft biological tissues. This paper review has 5 related sub-topics; 1. Introduction, 2. Biomaterial in Tissue Application, 3. Usage of Natural Ceramics in Bone Tissue Application, 4. Polymer in Biomedical Application and 5. Summary.

Designing DNA Probe from Human *Papillomavirus* (HPV) 58 in E6 Region as Biosensing Element for Development of Biosensor

N. Fareezah Jaapar[1], *N. A. Parmin[1], N. Hamidah A Halim[1], Uda Hashim[1], Subash C. B. Gopinath[1], A. Rahim Ruslinda[1], Sh. Nadzirah[2], C. H. Voon[1], M. N. A. Uda[1], Wei Chern Ang[3], Iffah Izzati Zakaria[4], Zulida Rejali[5], Amilia Afzan[5], Azrul Azlan Hamzah[2], Chang Fu Dee[2], and F. Syakirah Halim[1]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia.
[2]Institute of Microengineering and Nanoelectronics, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia.
[3]Clinical Research Centre, Ministry of Health Malaysia, Hospital Tuanku Fauziah, 01000 Kangar, Perlis, Malaysia.
[4]Malaysia Genome Institute, Jalan Bangi, 43000, Kajang, Selangor.
[5]Department of Obstetrics and Gynaecology (O&G), Faculty of Medicine & Health Sciences, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor.

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Abstract. Globally, second leading cause of death for women is a Cervical Cancer. CC is caused by infection of Human Papillomavirus (HPV). HPV strains 16 (50.8%), 18 (17.6%), and 58 (2.6%) became the most leading strains of infection in Malaysia. Recently, a study showed that HPV 58 was rare worldwide but famous in Asia countries including Malaysia. However, detection the significance of HPV-58 in women has not been studied extensively because of rare case compared to HPV 16 and 18. HPV-58 is commonly found in East Asia, but infrequently worldwide, due to changes in the environment of viruses and humans. Detailed biological knowledge is crucial for the development of effective countermeasures, diagnostic tests, vaccines and antiviral drugs against the HPV. The oligonucleotide sequences of HPV 58 in E6 region have been analysed between 24-35 mer in order to maintain the specificity and selectivity. The percentage of similarities between the coding sequences has developed with 66.7% of GC content. The DNA probe of HPV 58 was 5'GGG CGC TGT GCA GTG TGT TGG AGA CCC CGA3' with 30 mer of oligonucleotides. The important of E6 region for developing the coding sequence as it involved in the DNA reproduction, transcription, translation regulation and transformation of HPV genome. Phylogenetic trees were then constructed by Neighbor-Joining and the Kimura 2-parameters methods, followed by an analysis of selection pressures acting on the E6/E7 genes by ebi ac uk tools.

Effects of catalyst dosage and reaction time in the esterification of PFAD to produce FAME

M. F. Roslan[1], *Zuraida Wan[1], S.F. Halim[1], N. Isa[1], and N. A. Ali Bashah[1]

[1]Faculty of Chemical Engineering, Universiti Teknologi MARA, Cawangan Pulau Pinang, 13500 Permatang Pauh, Pulau Pinang, Malaysia.

Abstract. Fatty acid methyl ester (FAME) or biodiesel is widely being highlighted for its role as an alternative source for fuel used in compression ignition engine. Cr-Ti mixed oxides catalyst was synthesized by using sol-gel method and used in the esterification of palm fatty acid distillate (PFAD) to produce FAME. The reactions were conducted in a batch reactor at the temperature of 160 °C. The effects of catalyst dosage and reaction time were studied. The catalyst dosage between 0.5 wt.% to 2.5 wt.% and reaction time between 1 h to 5 h shows effect on the FAME density obtained in the reaction. The results indicates that reaction time of 4 h and catalyst dosage of 2.0 wt.% obtained FAME density of 845 kg/m3. The value is closest to the standard palm oil biodiesel density of 864 kg/m3. It was also observed that Cr-Ti catalyst that was prepared at calcination temperature of 500°C and time of 2 h has good thermal stability. Thus, Cr-Ti mixed oxides catalyst shows good potential as heterogeneous catalyst for enhancing FAME production.

Energy Harvesting in a Nonlinear Harvester Device Using Time Delay

*Zakaria Ghouli[1] and Mohamed Belhaq[2]

[1]Polydisciplinary Faculty of Taroudant, University Ibn Zohr, Morocco.
[2]Faculty of Sciences Aïn Chock, University Hassan II-Casablanca, Morocco.

Abstract. This paper explore periodic and quasi-periodic (QP) vibration-based energy harvesting (EH) in a delayed nonlinear oscillator in which time delay feedback is inherently present in the system and are present in the mechanical and electrical compenemts. The EH system consists in a delayed Duffing-van der Pol oscillator with a delayed piezoelectric coupling mechanism. We assume that the delay amplitude in the mechanical compenemt is modulated around a mean value with a certain frequency, and we consider the case of delay parametric resonance for which the frequency of the modulation is near twice the natural frequency of the oscillator. Application of the double-step perturbation method enables the approximation of the amplitude of the QP vibrations which is used to extract power from the harvester device. Results show that for small values of unmodulated delay amplitude in the mechanical compenemt, only the periodic vibration can be used to extract energy, while for larger values of unmodulated delay amplitude the periodic solution turns to unstable and only QP vibration can be used to extract energy with better performance. The influence of the time delay introduced in the electrical circuit on the performance of the periodic and quasi-periodic vibration based energy harvesting are examined. In particular, it is shown that for appropriate values of amplitudes and frequency of time delay in the electrical compenemt, the energy harvesting performance is improved over a certain range of parameters. Numerical simulation is conducted to support the analytical predictions.

Epoxy Ring Stability Optimization of Epoxidized Palm Olein using Taguchi Optimization Method

Anis Abd. Gani[1], *S K Jamaludin[2], H Hassan[2], Rafeqah Raslan[1], N A Zamanhuri[1], and M Z Mohd Yunus[1]

[1]Faculty of Chemical Engineering, Universiti Teknologi MARA, 40450, Shah Alam, Selangor, Malaysia.
[2]Faculty of Chemical Engineering, Universiti Teknologi MARA, Cawangan Pulau Pinang, Permatang Pauh, 13500, Pulau Pinang, Malaysia.

Abstract. Epoxy ring stability of epoxidized palm olein was studied by identifying the possible reaction conditions that affect the stability of epoxy ring and optimizing the reaction conditions using Taguchi optimization method. Parameters such as reaction temperature, type of catalyst, formic acid-to-palm olein unsaturation molar ratio and stirring speed were studied. Epoxidation results were based on the stability of epoxy ring, supported by conversion to epoxide. An $L9^{3-4}$ Taguchi orthogonal array was applied to design the experiment, and signal-to-noise (S/N) ratio was used to assess the most optimum level of each parameter. The results obtained indicated that the type of catalyst largely affect the stability of epoxy ring, with alumina being the most effective catalyst. The optimum operating conditions for epoxidation with respect to stability of oxirane ring were found to be: reaction temperature at 65ºC, formic acid-to-palm olein unsaturation molar ratio of 0.5:1, alumina as catalyst and stirring speed of 300rpm. The results also indicated that higher conversion to epoxide is achievable by using alumina as catalyst at low reaction temperature of 45°C. Formic acid also exhibited good performance as an autocatalyst to increase the conversion to epoxide, although it requires higher reaction temperature (65°C) and higher formic acid-to-palm olein unsaturation molar ratio (1:1).

Lightweight Organic Brick from Rice Husks.

*Umar Kassim[1], S. P. Au Yong[2], and M. N. Kamaruddin[3]

[1]Faculty of Civil Engineering Technology, UniCITI Alam Campus,Universiti Malaysia Perlis, 02100 Padang Besar, Perlis, Malaysia.
[2]School of Environmental, Kompleks Pusat Pengajian Jejawi 3, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia.
[3]Faculty of Engineering, Lincoln Universiti, 55 C, 57 C, 59 C Jalan SS 25/2, Taman Bukit Emas, 47301 Petaling Jaya, Selangor, Malaysia.

Abstract. A lightweight organic brick is an elective revelation item that should be considered in this cutting-edge world. The organic brick has additional, better properties than the conventional brick. It can decrease the exemplified energy of conventional brick during assembling. The utilization of this organic brick may spare more energy regarding warm solace perspective and assists with securing the climate as it makes less contamination. This item surfaces as an elective strategy to tackle the issue emerges because of the unused rice husks that is pilling in Perlis. In view of this thought, organic brick can be made with the utilization of lingering rice husks. Other than that, the quick advancement in Malaysia would build the block requests later on. This powers the main thrust to investigate inexhaustible and green elective item for conventional brick. Rice husk is a standout amongst other elective lightweight choices since it is eco-accommodating and is effectively gotten in Malaysia. Lightweight organic brick is made through oven dried; the combination of clay, rice husk and cement. The organic specimen contained up to 80% of rice husk is added and gone through oven dried technique to let the specimen to dry completely, whilst preparing to continue with the testing. The additional rice husk in the specimen increased the volume of pores, hence forth increasing the compressive strength. Thusly, as the level of added rice husk increment, its quality increments. Despite the fact that the compressive strength of organic brick specimen doesn't fulfil the norm, yet it actually satisfies low bulk density which is a lot of lower than the lightweight materials standard. Subsequently, it is truly appropriate to be utilized as a lightweight development material.

Photocatalytic Degradation of AO7 Aqueous Solution using Ag/CeO_2 Catalyst: Modeling of Process Parameters using Response Surface Methodology

Zal Helmi Abdul Hamid[1], *A. K. Nur Fadzeelah[1], Zuraida Wan[1], S. S. Sukri[1], S. K. Jamaluddin[1], and H. Hassan[1]

[1]Faculty of Chemical Engineering, Universiti Teknologi MARA, Cawangan Pulau Pinang, Kampus Permatang Pauh, 13500 Permatang Pauh, Pulau Pinang, Malaysia.

Abstract. In this study, photocatalytic degradation of Acid Orange 7 (AO7) aqueous solution was evaluated using Ag/CeO_2 as photocatalyst with the presence of UV light. The effect of process parameters such as pH, initial dye concentration and Ag/CeO_2 dosage were investigated using response surface methodology (RSM) based on three levels of Box-Behnken Design. The effect of process parameters and their binary interactions were analyzed using the polynomial regression model. The experimental data and ANOVA analysis showed that the coefficient of determination (R2) was 0.9580 which demonstrated that the model was significant. The response surface plot was successfully established the interaction effect of process parameters on the photocatalytic degradation of AO7 aqueous solution.

Simulation of Carbon Dioxide Foam Flooding-Biosurfactant Performance in Alpha Field

Chan Kuan Yee[1], *Akhmal Sidek[1,], Faridzul Arif [1], Kung Yee Han[1], Amni Haslinda Alpandi[2], Hazlina Husin[2], Aizuddin Supee[3], and Mohd Zaidi Jaafar[1]

[1]Petroleum Engineering Department, SCEE, Faculty of Engineering, Universiti Teknologi Malaysia.
[2]Petroleum Engineering Department, Universiti Teknologi Petronas.
[3]Energy Engineering Department, SCEE, Faculty of Engineering, Universiti Teknologi Malaysia.

Abstract. CO_2 foam flooding is a type of immiscible process which aided by foam to overcome the weaknesses of water alternate gas (WAG) flooding. Foam favourable for injectivity and mobility control to prevent viscous fingering and gravity segregation experienced by CO_2, thus increasing the sweep efficiency. The purpose of this study is to determine the comparison incremental oil recovery between CO_2-foam flooding and WAG by using simulator t-Navigator. A sensitivity analysis of key parameters such as biosurfactant concentration and level of injection interval was performed to optimize a flooding design for a sandstone reservoir in the Alpha field. The base case design which comprised of primary recovery, waterflood as secondary recovery and the tertiary recovery which consists of WAG and CO_2-foam flooding was developed based on actual field data. The simulation results indicate that CO_2-foam flooding is a potential enhanced oil recovery (EOR) method to be implemented in this field as it capable to give an incremental oil recovery about 71% compared to 62% by WAG. The result of the study on parameters selected indicates that the optimum biosurfactant concentration is 0.3 wt% as it delivers the highest oil recovery with the best injection interval occurs at middle region of the reservoir.

Substitution of Fly Ash as Mineral Filler In Wearing Course of Hot Mix Asphalt

*Mohd Badrul Hisyam Ab Manaf[1], Mohd Mustafa Al Bakri Abdullah[2], Rafiza Abdul Razak[1, 2], Muhammad Munsif Ahmad[1], Mustaqqim Abdul Rahim[1], and Sharifah Nurfarhana Tuan Muda[1]

[1]Faculty of Civil Engineering Technology, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia.
[2]Centre of Excellence, Geopolymer and Green Technology, Universiti Malaysia Perlis, Kompleks Pusat Pengajian Jejawi 2, Taman Muhibbah, 02600, Jejawi, Perlis.

Abstract. Construction of asphalt pavements with high stability for longer pavement service lives is needed. The performance of the asphalt pavement can be improved by adding fillers into the hot mix asphalt (HMA) mixture. Fly ash (FA) is one of the major by-product from thermal power plant that could be used as a substitution of Ordinary Portland Cement (OPC) as common filler in wearing course of HMA pavement. Nowadays, FA as one of the sustainable material to substitute OPC was found commercialized in construction field but it still limited use in HMA pavement. The primary aim is to investigate the Marshall Stability of HMA that incorporating of OPC and FA as filler. In addition, Optimum Bitumen Content (OBC) determination also conducted in this study. Marshall Stability test was carried based on ASTM 2006 for both mixtures. The parameters gained from the test are the stability, flow, air void in mix (VIM), void filled bitumen (VFB) and stiffness being used to obtain optimum bitumen content (OBC). The OBC for HMA with OPC filler obtained is 5.06% meanwhile for HMA with FA is 4.79%. All Marshall Parameters was complied with of Malaysia Public Work Department (PWD) Standard for both mixtures. The HMA with FA filler give better results for all parameters. Based on OBC percentage, usage of asphalt binder was reduce at 0.29%.Thus, it was more economical if using FA compared with OPC as a filler. Furthermore, HMA with FA filler have better stability and strength as well as lesser deformation with HMA with OPC filler. For the overall, FA have huge potential in substituting other mineral filler to produce better quality of asphalt pavement.

Non-Destructive Measurement and Evaluation of Surface Cracks Using Ultrasonic Rayleigh Waves – A Review

Muhamad Akmal Haziq Hishamuddin[1], Shahruddin Mahzan@Mohd Zin[2], Eliza M. Yusup[1]

[1]Bioactive Material (BIOMA), Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Johor, Malaysia.
[2]Structural Integrity and Monitoring Research Group (SIMReG), Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Johor, Malaysia.

Abstract. Quality control and inspection methods have become a critical challenge in everyday situations of the engineering profession. This is due to the evolution of the materials used today in industry and also increasingly complex and critical nature of many of the products and structures produced with them. Ultrasonic measurement is widely used especially in oil and gas and aerospace industries. This method is used because it is effective and not involving damaging the original parts. In ultrasonic measurement there are few types of waves emitted and where one of it is Rayleigh wave or mostly known as surface wave. Surface waves are generated when longitudinal waves intersects a surface near to the second critical angle. This review paper will describe about the types of waves emitted and produce and also some of the research that has been done related to the surface wave. This paper has 5 related sub-topics; 1. Introduction, 2. Ultrasonic Testing, 3. Type of Flaws, 4. Related Research and 5. Summary.

Removal of Tartrazine Dye using Kyllinga Brevifolia Extract and Silver Nanoparticles as Catalysts

Azzam Saiful Azhar[1], Wan Zuraida Wan Kamis[1], Haslinda Abdul Hamid[2], Nur Fadzeelah Abu Kassim[1], and *Norain Isa[1]

[1]Faculty of Chemical Engineering, Universiti Teknologi MARA, Cawangan Pulau Pinang, 13500 Permatang Pauh, Pulau Pinang, Malaysia.
[2]Department of Applied Sciences, Universiti Teknologi MARA, Cawangan Pulau Pinang, 13500 Permatang Pauh, Pulau Pinang, Malaysia.

Abstract. The objectives of this study was to determine the effectiveness of kyllinga brevifolia (KB) with silver nanoparticles (AgNPs) as catalysts in the removal of tartrazine dye. The experiment was carried out in batch mode. Different parameter such as temperature, initial concentration, contact time and pH were studied. It is found that the equilibrium was achieved in 20 minutes and the optimum pH was 2. The removal of dye was highest at 80˚C, which is 64%. From an initial concentration of 60 mg/L and onwards, the removal of dye was the most (62.34%) when compared to other intial concentrations. The use of a catalyst produced a removal of dye 20.68% more effective than without using a catalyst.

Analysis on the barrier properties of thin film PLA/PBAT reinforced with microcrystalline cellulose

*Sitti Fatimah Mhd Ramle[1], Aqilah Abdul Rahim[1], Nur Hafizzah Jusoh[1], Nurul Fazita Mohammad Rawi[2], and Che Ku Abdullah Che Ku Alam[2]

[1]1Forest Resources Technology Programme, Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, 17600 Jeli, Kelantan, Malaysia.
[2]Division of Bio-Resources Technology, School of Industrial Technology, Universiti Sains Malaysia, 11800 Pulau Pinang, Malaysia.

*fatimah.m@umk.edu.my

Abstract. In recent times, awareness on plastic pollution had increase which brings innovation on new productions to be environmental friendly. Various polymers has been used to analyse the suitability to produce thin films. In this study, Poly lactic acid (PLA) and Polybutylene adipate terephthalate (PBAT) reinforced with microcrystalline cellulose (MCC) were investigated. MCC were produced from selected bamboo were for obtaining cellulose, then followed by an acidic hydrolysis process for the processing of microcrystalline cellulose (MCC). In this study, the thin film are focusing on the barrier properties such as water absorption, solvent resistance and absorption test. From the results shows that, the lowest rate of water absorption rate is 1.9% by 1% B-MCC/PLA/PBAT, meanwhile, the highest rate of water absorption is 60.1% by 5% C-MCC/PLA/PBAT. The water absorption rate decrease gradually with the decreasing of amount of MCC in the samples. Lastly, the thin film samples can resist with oleic acid solvents as the condition of thin film samples is still remain but they were not resistance with xylene as the thin film samples were shrinked and degraded.

Effects of Artificial Intelligence on Education

* Ghaliya Al Farsi[1,2], Azmi bin Mohd. Yusof[1], Ragad M Tawafak[2], Sohail Iqbal Malik[2], Mohammed Wassem Ishfaque[2], Roy Mathew[2]

[1]Universiti Tenaga Nasional, College of Graduate Studies, Malaysia.
[2]Al Buraimi University College, Oman.

Abstract. The centers of higher education have recently witnessed many accelerated changes in scientific and technological development, forcing them to change their programs, methods and teaching strategies. Not only to keep pace with technological development but also to pursue adopting quality standards that allow them to establish an educational system that balances reality at all levels. And because the educational process is continually searching for modern methods, methods and strategies, higher education, like other fields, is looking for its advanced electronic and technological version by using artificial intelligence technology, which is the technology of the era, considering that it touches all Life fields: the start of simple computers, through smart devices and electronic applications, to the most complex machines, and within this intellectual context, this research paper comes to research the role of artificial intelligence in improving the quality of higher education.

Impact of Internet of Things (IoT) Technology in Education

* Ghaliya Al Farsi[1,2], Azmi bin Mohd. Yusof[1], Ragad M Tawafak[2], Sohail Iqbal Malik[2], Mohammed Wassem Ishfaque[2], Roy Mathew[2]

[1]Universiti Tenaga Nasional, College of Graduate Studies, Malaysia.
[2]Al Buraimi University College, Oman.

Abstract. Within the coming a long time, innovation will affect the learning involved in numerous ways. Internet of Things (IoT) proceeds to confirm its vital position within the setting of Information and Communication Innovations and the improvement of society. With the support of IoT, teach can upgrade learning results by giving more princely learning experiences, made strides operational proficiency, and by picking up real-time, robust understanding into student execution. This consideration is to discover the potential of IoT in higher instruction and maximize its benefits and reduce the perils included with it. Further efforts are fundamental for discharging the total potential of IoT frameworks and innovations. The Internet of Things (IoT), which can respect as an improved adaptation of machine-to-machine communication innovation, was proposed to realize thing-to-thing communications cleverly by utilizing the Internet network. Therefore, this paper presents to think about approximately the effect of IoT on higher instruction, particularly universities. IoT stands to alter significantly the way colleges work and improve understudy learning in many disciplines and at any level. It has enormous potential for universities.

Research Advances on The Application of FLEXSIM in Maintenance Processes: A mini Review

* Ruwaida Aliyu[1], Ainulakmar Mokhtar[2] and Hilmi Hussin[3]

[1]Mechanical Engineering Department, Universiti Teknologi PETRONAS, Bandar Seri Iskandar, 32610 Perak Darul Ridzuan, Malaysia

Abstract. Manufacturing companies in the current business environment should be more open, more versatile, and more competitive, and these goals can be accomplished by enhancing production and maintenance processes. Simulation is an excellent method used for decades for visualizing, estimating, and evaluating the dynamics of production processes and thereby aiding in the decision-making process. The use of FlexSim DES to improve the performance of manufacturing via maintenance optimization has been summarized in this work. All FlexSim maintenance-based studies have been discussed to provide a better understanding on its application in production optimization. The review shows that, less maintenance research attention has been given to the use of FlexSim for maintenance optimization. Areas such as spare parts inventory management, queue scheduling policy, task allocation, Overall equipment effectiveness (OEE) and process capability (PC) and maintenance planning and scheduling has been successful optimized to improved productivity using FlexSim. However, using FlexSim, so much can be done to solve problems, such as evaluating and identifying the most important Key Performance Indicators (KPIs) for organizations to minimize excessive costs, increase efficiency, enhance product quality without interruption, increase customer satisfaction, and have a better understanding of what kind of maintenance should be used in machinery or in any other field of the industry. This research will be a good guide for researchers to have focus on areas that need to apply the FlexSim simulation software for easy and less time-consuming results.

Relationship between Density and Early Compressive Strength of Slurry Infiltrated Fiber Reinforced Concrete (SIFCON)

* Mustaqqim Abdul Rahim[1], Lim Jiann Jonq[1], Afizah Ayob[1], Shamilah Anudai@Anuar[1], Nor Faizah Bawadi[1], Norlia Muhamad Ibrahim[1], Shahiron Shahidan[2], Ahmad Nur Aizat Ahmad[3]

[1]Faculty of Civil Engineering & Technology, University Malaysia Perlis, Arau, 02600, Malaysia.
[2]Faculty of Civil and Enviromental Engineering, UniversitiTun Hussein Onn, 86400, Batu Pahat,Johor, Malaysia
[3]Faculty of Technology Management and Business, UniversitiTun Hussein Onn, 86400, Batu Pahat, Johor, Malaysia

Abstract. The aim of the study is to study the physical and mechanical characteristics of Slurry Infiltrated Fiber Reinforced Concrete with fiber percentage volume of 5% and lower. For the testing of physical characteristics of the concrete, density test been conducted. For the testing of mechanical characteristics, compression test used to determine strength of concrete sample. The density of Slurry Infiltrated Fiber Reinforced Concrete increased when the usage of steel fiber percentage volume increases from 1% to 5%, nevertheless when compared to density of ordinary concrete, ordinary concrete is denser. For the mechanical properties of Slurry Infiltrated Fiber Reinforced Concrete, compressive strength increased when the fiber content increases from 1% to 5% percentage volume.

Performance Investigation of Graphene Based-Nanofluids as a Metalworking Fluid for Turning Process

* Norfazillah Talib[1], Muhammad Kamarul Ezwan Mohd Azmi[1], Nor Athira Jamaluddin[1], Woon Kiow Lee[1], Haslina Abdullah[1], Said Ahmad[1] and Aslinda Saleh[2]

[1]Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Batu Pahat, Johor, Malaysia
[2]Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Pagoh Higher Education Hub, 84600 Pagoh, Muar, Johor, Malaysia

Abstract. Most lubricants used for machining industry are mineral-based oil thus gives negative impact on environment and humans because of their toxicity and non-biodegradability. Therefore, vegetable-based oil has been taken as other initiatives to produce bio-based metalworking fluid (MWFs) especially from non-edible oil (jatropha oil). The aim of this study was to investigate the turning performance of nanofluids from modified jatropha based-oil (MJO) with the addition of graphene nanoparticles at various concentrations (0.01wt%, 0.025wt%, 0.05wt%). The performances of MJO based nanofluids were compared with synthetic ester (SE) as the benchmark oil in terms of cutting temperature, chip thickness and workpiece surface roughness. From the results, MJO + 0.025wt% graphene nanoparticles recorded the lowest cutting temperature, and chip thickness with smoother workpiece surface roughness compared to all samples. In conclusion, MJO + 0.025wt% exhibit superior machining performance and could be potential candidate as sustainable MWFs to replace mineral based oil for the machining processes.

Assessment of power generation performance for the integrated green roof-solar PV system

* Vanisha Arenandan[1] and Chow Ming Fai[2]

[1]Department of Civil Engineering, Universiti Tenaga Nasional, Jalan IKRAM-UNITEN, 43000, Kajang, Selangor.
[2]Institute of Sustainable Energy (ISE), Universiti Tenaga Nasional, Jalan IKRAM-UNITEN, 43000, Kajang, Selangor.

Abstract. Integrated green roof- solar photovoltaic (PV) system is known for its benefits in increasing the PV power generation, reducing the ambient air temperature and helps in overcoming urban heat island (UHI) issues. This study focuses on determining the effect of green roof in integrated green roof-solar PV performance. For this purposes, the solar power generation performance of integrated green roof-solar PV system was monitored and compared with solar PV panel system at the bare roof. The results showed that installation of green roof had reduced the PV surface temperature by 8.3%. Besides that, the PV power generation efficiency is enhanced by 0.4% with the implementation of green roof if compared to conventional roof.

Measuring Lean Culture – Validating a Research Instrument

* Azim Azuan Osman[1], Norani Nordin[1] and Norhasimah Ibrahim[2]

[1]School of Technology Management and Logistics, Universiti Utara Malaysia, 06010 Kedah, Malaysia.
[2]Corporate and Planning Development Division, Malaysia Productivity Corporation, 46904 Selangor, Malaysia.

Abstract. Lean culture is often claimed as one of the determinants to sustain lean transformation in manufacturing organizations. However, existing studies that examine the effect of lean culture on lean transformation sustainability were short of quantitative evidence. The absence of a practical and valid instrument to measure the level of lean culture especially in manufacturing settings is the reason behind this shortcoming. Hence, this article was written to introduce and validate a practical instrument to measure lean culture. A research instrument in the form of self-administered questionnaire (SAQ) was designed and validated by panel of ten experts. SAQ is a practical instrument to measure a latent variable (concept) such as lean culture, since it can record and translate unobserved behaviour into a quantifiable data. An item content validity index was calculated for each indicator measuring lean culture. Items with content validity indexes greater than 0.80 were retained and item with lower content validity index were dismissed. The instrument has evidence of content validity and will need further validation using more advance statistical techniques such as confirmatory factor analysis or confirmatory composite analysis.

Influence of Outlets Port Design on The Tesla Turbine Performance

* Sufi Halim[1], Md Tasyrif Abdul Rahman[1], Anas Abdul Rahman[1], Muhammad Adi Hilmi Adnan[1], Muhammad Hafizi Azuzin[1] and Gisrina Elin Suhri[1] and M. Fathullah[1,2]

[1]Faculty of Mechanical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.
[2]Green Design and Manufacture Research Group, Geopolymer & Green Technology, Centre of Excellence (CEGeoGTech), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.

Abstract. The boundary layer turbine known as Tesla Turbine invented long ago but has failed to be commercialized and replaced by bladed turbines. In this paper, two new techniques for improving the turbine have been proposed. A test model of the proposed boundary layer turbine has been fabricated made and tested under different conditions. The design process includes producing a virtual design and simulation of the turbine using computer software. The proposed designs were fabricated and then tested to analyse results such as speed produced, power produced, and the turbine efficiency. From this study, the proposed turbine designs manage to achieve 18% and 69% efficiency.

High Gain Transformer-less DC/AC Inverter for PV System

* I. A. Zunnurain[1], M. F. Hariz[2], S. M. Ilham[2], N. Kimpol[2], M. N. K. Anuar[2] and K.M. Yumi[3]

[1]Kulliyyah of Engineering (Electrical), Universiti Islam Antarabangsa (UIA), Malaysia.
[2]Faculty of Electrical Engineering, University Malaysia Perlis (UniMAP), Malaysia.
[3]School of Electrical Engineering, Universiti Teknologi Malaysia (UTM), Malaysia.

Abstract. Investigation interests on many scientific aspects of photovoltaic (PV) trans-former-less inverter system has improved over the past decade. Using step-up transformer or high frequency transformer in electrical system has made the entire system expensive and voluminous. There is alternative topology to replace the transformer by implementing DC/DC quadratic boost converter to expand the voltage from to from the photovoltaic (PV) solar and convert it to AC applying H-bridge inverter circuit. The circuit is simulated using Power Sim (PSIM) software to initiate the design and study the circuit capability. The experimental result will project the exact voltage in the range of . The harmonic profile of the inverter is studies and compared with the normal inverter configuration.

Effect of Graphene Nanoplatelets on Water Absorption Properties of Coconut Shell reinforced Unsaturated Polyester Composites

* A. Abdullah[1], M.B. Abu Bakar[1], S.H. Mohd[1], M.N. Masri[1], A. Hermawan[1] and A.S. Sharizal[1]

[1] Advanced Materials Research Cluster, Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan Malaysia.

Abstract. Coconut shell (CS) reinforced unsaturated polyester (UPE) composites have been prepared by using hand lay-up and compression molding technique. To improve fiber matrix adhesion, the CS was chemically treated by two chemical treatments which are alkaline (NaOH) and alkaline-silane with concentration NaOH (6%) and silane (2%). To enhance the performance of CS-UPE composites, graphene nano platelets (GNP) was also added as nano filler. The water absorption tests were conducted in order to characterize the physical properties of the composites. The result shows that, water absorption increases with the increasing GNP. The more adding of the weight percentages of GNP fillers, the higher of water absorption will be getting.

Analysis on Inlet Nozzle Design Geometry of Tesla Turbine

* Sufi Halim[1], Md Tasyrif Abdul Rahman[1], Anas Abdul Rahman[1], Nasrul Amri Mohd Amin[1], Nur Shuhaila Roslan[1] and M. Fathullah[1,2]

[1]Faculty of Mechanical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia
[2]Green Design and Manufacture Research Group, Geopolymer & Green Technology, Centre of Excellence (CEGeoGTech), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.

Abstract. Tesla turbine is a bladeless turbine that uses a set of discs arranged at a certain distance to rotate and one of the parameters controlling turbine performance is the inlet parameter. The purpose of this study is to optimize the design of the inlet nozzle and analyze its effects on the flow of the fluid. A total of four nozzle designs have been proposed using CATIA while the Solidworks Flow Simulator is used to analyze the fluid flow at various inlet velocities. Then, the most efficient design is then fabricated via 3D printing and put to test by connecting it with the actual Tesla turbine model. Through the results obtained from the analysis, it is observed that Design 4 is the most efficient of all tested nozzles and no changes occur between the outlet and the inlet in Design 1 and 2. However, there is a significant difference that occurs in Design 3 and 4. After fabricating it, the highest RPM and output voltage achieved due to the nozzle is 7940 RPM and 13.56 V. The difference in velocity and pressure increases as the area of the nozzle outlet reduces, whereas nozzle efficiency decreases as the inlet velocity increases.

Alternative Route for Biodiesel Synthesis with Co-Production of Glycerol Carbonate

* Zul Ilham[1] and Shiro Saka[2]

[1]Institute of Biological Sciences, Faculty of Science, Universiti Malaya 50603 Kuala Lumpur, Malaysia.
[2]Graduate School of Energy Science, Kyoto University 606-8501 Kyoto, Japan.

Abstract. As an alternative route from the conventional alkali-catalyzed biodiesel production, the supercritical dimethyl carbonate had successfully been proven to produce biodiesel with co-production of glycerol carbonate in a one-step and two-step non-catalytic methods. Biodiesel or fatty acid methyl esters (FAME) were obtained are high in yield, comparable with supercritical methanol method and satisfy the international regulations for use as biodiesel. In this paper, key parameters for the processes such as reaction temperature, pressure, time, molar ratio of dimethyl carbonate to oil, the FAME yield, thermal decomposition, degree of denaturation, tocopherol content, oxidation stability and fuel properties were discussed. The optimized condition for supercritical dimethyl carbonate method is at 300ºC/20MPa/20min/42:1 molar ratio of dimethyl carbonate to oil with a satisfactory yield of FAME at 97.4wt%. Such extensive approach towards optimization is important to complement mathematical model for optimization in the literature, and to ensure that only high-quality biodiesel could be produced by supercritical dimethyl carbonate method, under such an optimized condition.

A Studies on Variation Modulation Index towards SPWM Unipolar Inverter

* K.M. Yumi[1], S. M. Ilham[2], A. M. Yusof[2], N. Kimpol[2], and H. M. Habibah[2]

[1]School of Electrical Engineering, Universiti Teknologi Malaysia (UTM), Malaysia.
[2]Faculty of Electrical Engineering, University Malaysia Perlis (UniMAP), Malaysia.

Abstract. Inverter is an electrical system or circuitry that converts direct current (DC) to alternating current (AC). The inverter output voltage and frequency can be modified. There are various modulation techniques used to power the inverter. Some of these techniques can be used online, some analogously. Classical Sinusoidal Pulse Width Modulation (SPWM) is a system that is usually implemented analogously. Standard sampled sinusoidal PWM methods are known methods for digital implementation of this method. The implementation of the symmetrical standard sampled sinusoidal PWM approach is discussed in this review. Two fundamental factors that are efficient in this form of modulation system are explored through the harmonious study of the switching frequency and modulation index, the inverter pole voltage, and the line voltage. The fundamental part and the produced harmonics are investigated from an inverter that supplies a three-phase RL load using the Symmetric Regular Sampled SPWM system with five different switching frequencies and three different modulation index values. The Modulation Index is studied for linear regions and for modulation regions. The low, medium and high switching frequency samples are also picked for the switching frequency. The findings of the harmonic analysis obtained are discussed in the report.

Electrical and Topography Analysis of 50 µM Gap Aluminium Based Interdigitated Electrode

* M.N. Afnan Uda[1], U. Hashim[1], M.N.A. UDA[2] and Tijjani Adam[3]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia.
[2]Faculty of Chemical Engineering, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia.
[3]Faculty of Technology, Universiti Malaysia Perlis, Kampus Uniciti Alam Sg. Chuchuh, 02100 Padang Besar (U), Perlis, Malaysia.

Abstract. The aim of this research study is to study the electrical and topography analysis of fabricated Aluminium Interdigitated Electrode (Al IDE). Al IDE pattern was designed using AutoCAD software with 50 µM finger gap. Fabricated electrode was physically characterized using High Power Microscope (HPM), Scanning Electron Microscope (SEM) and electrically validated through I-V measurement using Current Source Meter (Keithley 2450) and sensor platform. Electrical measurement confirmed that Al IDE was well fabricated without any shortage and results of similar Al IDE samples were confirmed that the repeatability of the device.

Optimizing the Operation Management for the Business Process Port Terminal Information System Using Web-Based Application

* Nurul Najihah Zanudin[1], Hairudin Abdul Majid[1], Azurah A Samah[1], Yusliza Yusof[1], Lizawati Mi Yusof[1], Dewi Nasien[2]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 Johor Bahru, Johor, Malaysia.
[2]Institut Bisnis dan Teknologi Pelita Indonesia, Pekanbaru, Riau, Indonesia.

Abstract. Information and communication technology (ICT) have offered various platforms and tools for organization to promote business information and services to the global market. Port Terminal is known as the largest and biggest place for the logistic and transportation industry. It provides services such as shipping and marine request and required a powerful technology to support 24-hours services for the user. This research was conducted to revamp the existing system for Johor Port Berhad and named it as Port Terminal Information System (PTIS) by using a latest and powerful technology such as JAVA. PTIS requires strategic application system that consolidated all transactions from different departments such as Vessel Clearance, Marine Services, Multi-Purpose Terminal, Johor Port Container Terminal and Free Zone department and aimed to simplify the business process. This research gathered requirements from stakeholder and proposed to automate the manual process such as user registration and termination process. This research implemented The Rational Unified Process (RUP) of Agile Methodology to develop PTIS. This research implemented User Acceptance Testing (UAT) with stakeholders to detect if there is any error and to check if the system meets user's expectation. During this activity, unexpected technical error was occurred, but it was changed accordingly. Testing activity have been recorded in Software Testing Documentation (STD).

Optimization of Tool path Length on Three-Dimensional Drilling Application Using Ant Colony Algorithm

* Muhammad Danial Ikmal bin Rusman[1], Haslina Abdullah[1], Mohamad Shukri Zakaria[2], Norfazillah Talib[1], Lee Woon Kiow[1], Aslinda Saleh[3]

[1]Faculty of Mechanical and Engineering,Universiti Tun Hussein Onn Malaysia, Malaysia.
[2]Fakulti Kejuruteraan Mekanikal, Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, Durian Tunggal, Melaka.
[3]Faculty of Engineering Technology,Universiti Tun Hussein Onn Malaysia, Malaysia,

Abstract. The lower machining time is important characteristic in the drilling machining process. Drilling process costs will increase if the machining time is high. Therefore, the main objective of this research is to develop Ant Colony Algorithm (ACO) to reduce the machining time by obtain the optimal tool path length. Simulating in 3-dimensional drilling on ACO has been constructed to minimize the shortest path of the drilling process. There are two type of workpiece has been used, which is simple block with 10 holes and complex block design that has 154 holes. ACO algorithm has been developed in Matlab R2017b to determine the optimal parameters of ACO of tool path length in drilling. Besides, simulation also has been done to investigate the effect of ACO parameter which is weight of pheromone (α), weight of trail (β), evaporation coefficient (e), and number of iterations. As a result, by define the parameter of iteration number at 900, the optimum parameter of weight of pheromone (α) is 5, weight of trail (β) is 4 and evaporation coefficient (e) is 0.4. Based on these parameters, the minimal tool path length obtain for simple and complex model are 286.965 mm and 6770.9860 mm respectively. Then, the result of tool path length of ACO simulation has been compared with the Mastercam outcome. ACO achieves a total tool path length of 286.965 mm while Mastercam achieved 569.878 mm for simple block design. Meanwhile, for complex block design, ACO produces a total tool path length of 6770.9860 mm while Mastercam has generate 55828.9050 mm of tool path length. By comparing these two approaches, ACO and Mastercam, ACO has that the short total tool path length by 49.64% on simple block design and 87.87% for complex block design.

Reformulation of Nuclear Decay Equations Under The Influence of Fuzzy Logic

* Moath Ali Alshorman[1], Nurnadiah Zamri[1], Mohammed Ali[2], Asia Khalaf Albzeirat[3]

[1]Faculty of Informatics and Computing, Universiti Sultan Zainal Abidin, Besut, Terengganu, Malaysia
[2]Department of Mathematics, Jordan University of Science and Technology, Irbid 22110, Jordan.
[3]Department of Mathematics, Mutah University, Mutah, Jordan.

Abstract. This paper aims to reformulate Nuclear Decay Equations (NDEs) under the influence of fuzzy logic. The basic concepts of fuzzy logic were used to formulate this equation. The results showed three different cases of equations according to the effect of fuzzy logic.

Designing a Questionnaire to Identify the Challenges Facing E-Learning Education in Light of the Corona Pandemic

* Louay Flaieh Hasan[1], Amani Ali Elmetwaly Ali Ibrahim[1], Syed Zulkarnain Bin Syed[1]

[1]Malaysia Perlis (UniMAP)/Faculty of Applied and Human Sciences, Malaysia.

Abstract. The questionnaire is one of the most important methods for gathering data, which relies on the quantitative methodology of the data. The widespread of the Corona pandemic in the world and the prevention of gathering and mixing after it has been confirmed and with convincing proof that it is the main cause of the propagation of Virus Covid-19, the process of implementing educational alternatives. In order to ensure the continuity of education during this pandemic, which faced multiple challenges and obstacles, this study examines the design and implementation of a questionnaire in line with the required methodology for the identify the most important of these challenges and barriers.

LexisNexis Database: A Study on Usage and Satisfaction

* Adila Ismail[1], Habee Bullah Affandy[1], Mohammad Rezal Hamzah[1] and Huzili Hussin[1]

[1]Faculty of Applied and Human Sciences, Universiti Malaysia Perlis, 01000 Perlis, Malaysia.

Abstract. Providing access to information especially in the forms of articles and journals has given students access to reliable information for references. In this study, the researchers identify the level of usage of LexisNexis among the students from the Faculty of Law, Universiti Teknologi Mara due to its appropriateness towards the Law field. Also, the study aims to identify the level of user satisfaction towards the usage of LexisNexis, based on the Technology Acceptance Model.

Explorations of A Real-Time VR Emotion Prediction System Using Wearable Brain-Computer Interfacing

* Nazmi Sofian Suhaimi[1], James Mountstephens[1] and Jason Teo[1]

[1] Faculty of Computer and Informatics, Universiti Malaysia Sabah, 88400, Kota Kinabalu, Sabah, Malaysia.

Abstract. The following research describes the potential of using a four-class emotion classification using a four-channel wearable EEG headset combined with VR for evoking emotions from each individual. Multiple researchers have conducted and established emotion recognition by using a 2-D monitor screen for stimulus responses but this introduces artifacts such as the lack of concentration on-screen or external noise disturbance and the bulky and cumbersome wires on an EEG device were difficult and time-consuming to set up thus restricting to only the trained professionals to operate this complex and sensitive medical equipment. Therefore, using a small and portable EEG headset where it was accessible for consumers was used for the brainwave signal collection. The wearable EEG headset collects the brainwave samples at 256Hz at specific locations of the brain (Tp9, Tp10, AF7, AF8) and samples were transformed via FFT to obtain the five bands (Delta, Theta, Alpha, Beta, Gamma) and were classified using random forest classifier. An emotion prediction system was then developed and the trained model was used to benchmark the prediction accuracy from each individual. Subsequently, a real-time prediction system was implemented and tested. Early findings showed that it could achieve predictions as high as 76.50% for intra-subject classification results.

High Gain Transformer-less DC/AC Inverter for PV System

* I. A. Zunnurain[1], M. F. Hariz2, S. M. Ilham[2], N. Kimpol[2], M. N. K. Anuar[2] and K.M. Yumi[3]

[1]Kulliyyah of Engineering (Electrical), Universiti Islam Antarabangsa (UIA), Malaysia.
2Faculty of Electrical Engineering, University Malaysia Perlis (UniMAP), Malaysia.
3School of Electrical Engineering, Universiti Teknologi Malaysia (UTM), Malaysia.

Abstract. Investigation interests on many scientific aspects of photovoltaic (PV) trans-former-less inverter system has improved over the past decade. Using step-up transformer or high frequency transformer in electrical system has made the entire system expensive and voluminous. There is alternative topology to replace the transformer by implementing DC/DC quadratic boost converter to expand the voltage from to from the photovoltaic (PV) solar and convert it to AC applying H-bridge inverter circuit. The circuit is simulated using Power Sim (PSIM) software to initiate the design and study the circuit capability. The experimental result will project the exact voltage in the range of $230V_{ACrms}$. The harmonic profile of the inverter is studies and compared with the normal inverter configuration.

A Multiclass Predictive VR Emotion System using Heart Rate and Inter-Beat Interval

* Aaron Frederick Bulagang[1], James Mountstephens[2], and Jason Teo[3]

[1]Graduate Researcher, Evolutionary Computing Lab, Faculty of Computing and Informatics, Universiti Malaysia Sabah, 88400, Kota Kinabalu, Sabah, Malaysia.
[2]Senior Lecturer, Faculty of Computing and Informatics, Universiti Malaysia Sabah, 88400, Kota Kinabalu, Sabah, Malaysia.
[3]Professor, Lab, Faculty of Computing and Informatics, Universiti Malaysia Sabah, 88400, Kota Kinabalu, Sabah, Malaysia.

Abstract. Predictive emotion is a method that employs psychophysiological data from participants through wearable for instance Heart Rate (HR) and Inter-Beat-Interval (IBI), the psychophysiological data is then analyzed with machine learning through Support Vector Machine (SVM). The main psychophysiological signal used in this experiment is HR combined with IBI, HR, and IBI combination as a signal in emotion prediction classification in four-class is still lacking when compared to signal such as Electroencephalogram (EEG). In this experiment, 10 subjects took part in collecting their HR and IBI data while wearing a Virtual Reality (VR) headset as the stimuli to view 360 videos. Intra-subject classification in four-class was performed using machine learning with SVM as the classifier. The highest accuracy achieved is 81.8% for intra-subject classification using a combination of HR and IBI data. These results through this experiment present the novelty of achieving high accuracy results for predictive emotion classification in a four-class setting with HR merged with IBI data.

Purification of crude glycerol from waste cooking oil for the production of biosoap

Tong Shi Hui[1], Sitti Fatimah Mhd. Ramle[1], Wong Yee Ching1, and *Zubaidah Aimi Abdul Hamid[1]

[1] Faculty of Bioengineering and Technology, Universiti Malaysia Kelantan Jeli Campus, Locked Bag 100, 16700, Jeli, Kelantan, Malaysia.

*zubaidahaimi.ah@umk.edu.my

Abstract. High purity of glycerol is widely used in various industries application. However, low purity of glycerol produced from the biodiesel industry as a by-product is an obstacle to convert into a high valued product. This study aims to purify crude glycerol extracted from waste cooking oil using acidification, neutralization, activated carbon adsorption followed by solvent evaporation process. The potential application of purified glycerol extracted from waste cooking oil was then observed in the production of biosoap. The physico-chemical properties of purified glycerol extracted from waste cooking oil show pH of 6.03 and light in yellow. The results showed that the biosoap produced using purified glycerol from waste cooking oil was good in terms of pH and colour. The pH was in the acceptable range which was at pH 10.50 ± 0.055 which considered safe to be used while the colour was acceptable as it was light in yellow. However, the texture of the biosoap was a little soft which the hardness was 59.67±4.041 which its shelf life would be affected. From the results in this study, it was proven that the purification methods were significant to remove impurities from the crude glycerol extracted from waste cooking oil.

Monitoring of Stiffness Estimation for Tomato During Storage Period

*M.K.R. Hashim[1], M. N. A Uda[1,2], Muhammad Adi Yusri Mohd Sabri[1], U. Hashim[2] and M.N. Afnan Uda[2]

[1]1Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis, Perlis, Malaysia
[2]Institute of Nanoelectronic Engineering, University Malaysia Perlis, Malaysia.

Abstract. The aim of this study is to develop a stiffness estimation for tomato during storage period. This project involved the usage of modern tools such as Arduino and LabVIEW where both of them were used to controls and regulate the data collected from a buzzer that produced sinusoidal sound wave. The time taken for the sound wave to reach the microphone were recorded as it was considered as the important factor in determining the stiffness factor, S, alongside the changing mass and diameter of the tomato during its storage period. At the end of the project, it was shown that the stiffness value of the tomato decreases in hand as the day progress. Furthermore, the correlation of the parameters was also calculated in which R2 value between stiffness and weight was finalised at 0.8993, with equation of y = 379.45x – 40.321. The findings had successfully proved that the parameters involved in the research are greatly related.

Capillary Driven Muilti Channels Microfluidic

*U. Hashim[1], Tijjani Adam[1,2], M. N. Afnan Uda[1], and M. N. A. Uda[1,3]

[1]1Institute of Nanoelectronic Engineering, University Malaysia Perlis, Malaysia
[2]Faculty of Electronics Engineering Technology (FTKEN),Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[3]Faculty of Chemical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

Abstract. The paper present design and fabrication of capillary driven muilti channels microfluidic. AutoCAD assisted layout design was conducted and fabricated based on cold photolithography process with precise geometry for capillary flow. The design was bonded with glass to test the flow and bonding integrity. The device was tested for flow and it was found the uniform capillary flow was established with strong bonding energy.

Determination of Silicon Electrical Properties Using First Principles Approach

*U. Hashim[1], Tijjani Adam[1,2], M. N. Afnan Uda[1], and M. N. A. Uda[1,3]

[1]1Institute of Nanoelectronic Engineering, University Malaysia Perlis, Malaysia
[2]Faculty of Electronics Engineering Technology (FTKEN),Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[3]Faculty of Chemical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

Abstract. Silicon nanowires have attracted attention as basis for reconfigurable electronics. However, as the size decreases, the electronic properties of the nanowires vary as a result of confinement, strain and crystal topology effects. Thus, at the thin diameter regime the band gap of Silicon nanowires can no longer be derived from a simple extrapolation of the isotropic bulk behaviour. This study compares band gap parameters in sub 10nm nanowires obtained from first-principles density-functional band structure calculations with extrapolations using continuum theory in order to rationalize the changes of the overall conductance, resistance and band gap. The device consists of silicon nanowire of size between 1 nm to 6nm. The results indicate an increase of, both the energy gap and the resistance along with reduced conductivity for the thinnest wires and a dependence on the crystal orientation with gaps reaching up to 4.3 eV along <111>, 4.0 eV along <110>, and 3.7 along <100>..

Silicon Young Modulus Using First Principle Approach

*U. Hashim[1], Tijjani Adam[1,2], M. N. Afnan Uda[1], and M. N. A. Uda[1,3]

[1]1Institute of Nanoelectronic Engineering, University Malaysia Perlis, Malaysia
[2]Faculty of Electronics Engineering Technology (FTKEN),Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[3]Faculty of Chemical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

Abstract. Mechanical properties and total energy of SiNWs were studied based on first principle method via density functional theory. Abinit code were used for calculation as implemented in Linux coupled with Matlab scripts. Effect of various sizes and orientations on mechanical properties and total energy of silicon nanowire were identified. The mechanical properties and total energy at (001), (110) and (111) were determined. The atomic interaction in the wires influenced various mechanical parameters of the wire. The results show the strain for the three orientations were 0.1164×10-5, 0.12×10-5 and 0.115×10-5 with modulus of 149.6GPa, 75.5GPa and 85.1GPa respectively.

Determination of Silicon Nanowire Total Energy Based on Local Density Approximation

*U. Hashim[1], Tijjani Adam[1,2], M. N. Afnan Uda[1], and M. N. A. Uda[1,3]

[1]1Institute of Nanoelectronic Engineering, University Malaysia Perlis, Malaysia
[2]Faculty of Electronics Engineering Technology (FTKEN),Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[3]Faculty of Chemical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

Abstract. The total energy of the silicon nanowire is getting attention recently, due to the wire application battery. Thus, this study presents the silicon nanowire total energy based on local density approximation the results that showed silicon nanowires have better energy with standing. These properties can contribute to the reliability and design of novel silicon nanodevices especially in battery industry. Electronic properties of SiNWs were studied based on First principal method via DFT. Abinit code were used for calculation as implemented in Linux. The total energy at (001), (110) and (111) with different sizes were calculated. The total energy for (001), (110) and (111) SiNWs are -1.33, -1.35 and -1.37 respectively. SiNWs in the direction of {111} has the lowest total energy.

Nanowires Vibration Properties

*U. Hashim[1], Tijjani Adam[1,2], M. N. Afnan Uda[1], and M. N. A. Uda[1,3]

[1]1Institute of Nanoelectronic Engineering, University Malaysia Perlis, Malaysia
[2]Faculty of Electronics Engineering Technology (FTKEN),Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[3]Faculty of Chemical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

Abstract. The vibration properties and the mechanical characteristic are important for the stability of electronics devices, particularly for Nano devices with high potential application. Silicon Nanowire show different properties from the corresponding bulk silicon. The understanding of its behaviour with reliable theoretical model explain the relation between size effect of the nanowire and the vibration frequency is significant to reveal the mechanical behaviour of the device is very important. Thus, this study, present the effect of small diameter of Silicon Nanowires on Its Vibration Properties is established based on the lattice parameters and the binding energy change of silicon nanowire based on first principles calculations through Abinit. Atomic interaction of the SiNWs obtained based on the density functional theory. It was observed that the atomic interaction energy as result of electromechanically induced pressure due -hole pair in which electron (e−) was reductive, and hole (h+) was oxidative. The hole (h+) reacted with e− in the second nanowire, generating free radicals (e−), superoxide anion and perhydroxyl radicals which create phonon group velocity this create vibration. Due to the excessive energy of process the temperature rises and alters the atomic cubic dimensions in turn affect its elastic properties. The nanowire compared with with bulk silicon exhibit high higher modulus, this as result of damped behaviour of the nanowire which is due to the high frequency vibration of silicon atoms at the edge of SiNWs and its Debye length is shorter. As the wire diameter decrease effect of the atomic vibration is reduced.

Theoretical Determination of Nanostructure Orientation Influence Band Structure

*U. Hashim[1], Tijjani Adam[1,2], M. N. Afnan Uda[1], and M. N. A. Uda[1,3]

[1]1Institute of Nanoelectronic Engineering, University Malaysia Perlis, Malaysia
[2]Faculty of Electronics Engineering Technology (FTKEN),Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia.
[3]Faculty of Chemical Engineering, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

Abstract. The influence of orientation for nanostructures on electronics properties is evaluated theoretically in this paper. The orientation structures show remarkable influence on the silicon semiconductor materials. The geometries of nanostructure have mainly an influence on the surface charges activity. Orientation (111) has the highest charges activity among the three nanostructures orientations. The greatest enhancement of the band structure is obtained attributed to the extremely higher specific surface area due to the geometry influence. Thus, this finding results analysis described herein will serve as an effective benchmark for the design and subsequent nanostructures fabrication of the nanostructures..

Electrical Characterization of Polypyrrole thin film conducting polymer

N.Syamimi and S. Yahud

Faculty of Electronic Engineering Technology, Universiti Malaysia Perlis, kampus Alam UniMAP, Pauh Putra, 02600 Arau, Perlis.

Abstract. This paper report the electrical characteristics and electrical resistance of individual synthesized Polypyrrole (PPy) thin film (0.0238 µm thin) at room temperature. The IV characteristic is found to be nonlinear at room temperature. The two-point probe and four-point probe characterization methods both were used in the resistance measurements. The PPy is doped in organic acids and deposited on to glass substrate via spin coating method.

Enhanced Performance of 5.8 GHz Microstrip Patch Antenna using Shorting Pin and Defective Ground Structure

*Keerrthenan Yoorththeran, Noorlindawaty Md Jizat, Lo Yew Chiong

Faculty of Engineering, Multimedia University, Cyberjaya, Malaysia.

Abstract. A high gain antenna with good directivities are needed to provide the effective transmission and receiving in the wireless device where the signal can be pointed in a preferred direction, whilst increasing the received signal strength. This paper studies on the method to enhance the antenna's performance by combining two techniques of shorting pin and Defective Ground Structure (DGS) into the conventional microstrip patch antenna at 5.8 GHz. The design utilizes the Roger RO4350B as the dielectric substrate of the structure with the thickness of 0.508 mm and the permittivity of 3.48. The analysis performed in this study includes the variation of the pin diameter towards the antenna's gain, directivity and the frequency shifting. Varying the position and the diameter of the shorting pin control the dual-frequency spacing for the efficient widening of the bandwidth of the microstrip patch antenna and the antenna's resonant frequency. The results obtained by loading the shorting pin into DGS patch antenna shows the return loss obtained less than -10 dB, the gain of 6.36 dB, the directivity of 7.2 dB, 57.81% of bandwidth improvement and the gain improves by 27.20 % to fulfil the requirement for the point to point wireless communication at 5.8GHz.

Highly Sensitive pH Sensors Enabled by Interdigitated Electrode (IDE) with Gold Nanoparticles (AuNP) Doped Sensing Membrane

V. Thivina[1], U. Hashim[1], 'A. Ayoib[1], N. K. S. Nordin[1], M. N. A. Uda[1,2], M. N. Afnan Uda[1]

[1]1Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis.
[2]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

Abstract. Low sensitivity and poor reliability currently limit the applications of solid-state biosensors. Interdigitated Electrodes are highly used for detecting various target analytes in chemical and biological solutions. Meanwhile, pH is a quantitative measure of the acidity or basicity of aqueous or other liquid solutions. In this study, we demonstrate an Interdigitated Electrode (IDE) sensor with a large capacitance, high pH sensitivity, and good reliability. The IDE was fabricated by using photolithography technique. A gold nanoparticle (AuNP) coating was employed as a sensing membrane. The IDE sensors with 50µm electrode gap doped with AuNPs on its sensing area exhibited larger current flow and a more stable conductivity than that of a bare aluminium based IDE that were fabricated using the same fabrication scheme without integrating AuNPs. Our results and analysis clearly indicate that ultra-sensitive pH sensing can be realized with optimized AuNP doped IDE.

Distinct Detection of Ganoderma boninense on Metal Oxides-Gold Nanoparticle Composite Deposited Interdigitated Electrode DNA Sensor

V. Thivina[1], U. Hashim[1], S.C.B. Gopinath[1,2], 'A. Ayoib1, N. K. S. Nordin[1], M. N. A. Uda [1,2], M.N. Afnan Uda[1]

[1]itute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia
[2]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis (UniMAP), 02600 Arau, Perlis, Malaysia.

Abstract. Oil palms suffer severe losses due to Ganoderma boninense infection that causes Basal Stem Rot (BSR). The available detection measuring the severity of BSR disease have not proved satisfactory output. Due to the influence of oil palm industry in country's economy, effective and efficient means of diagnostic measure is mandatory. Among the available diagnostic tools, biosensors were redeemed to yield the most rapid and selective results. To overcome the current issues, herein Interdigitated Electrode (IDE) electrochemical DNA biosensor to detect Ganoderma boninense was successfully designed and fabricated by thermal deposition. Lift-off photolithography fabrication process was applied followed by the surface chemical functionalization via seed deposition. Zinc Oxide (ZnO) and Titanium Dioxide (TiO2) were overlaid and the functionalized metal oxides IDE surfaces were used to detect DNA sequence complementation from Ganoderma boninense. Furthermore, gold nanoparticles were doped to increase the surface to volume ratio and enhance biocompatibility. Characterizations were made by validating the sensor's topology characteristics and electrical characteristics. From the results recorded, it has been justified that IDE with ZnO doped with gold nanoparticles surface serves as an excellent DNA sensor for the detection of Ganoderma boninense with a remarkable current of 290 nA and 176 nA for immobilization and hybridization respectively.

High Accuracy Voltage Amplifier Electronic Reader for Two Electrode Electrical Biosensors

M.N. Afnan Uda[1], U. Hashim[1], M.N.A. Uda[1,2] and Tijjani Adam[3]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia
[2]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia
[3]Faculty of Technology, Universiti Malaysia Perlis, Kampus Uniciti Alam Sg. Chuchuh, 02100 Padang Besar (U), Perlis, Malaysia.

Abstract. Low current output detection based electronic reader are the key factor for biosensors commercialization. Two type electrode based amperometric biosensors show low current signal output around nanoampere (pA) to microampere (µA) range. In this research, an electronic reader system with voltage converter, voltage amplifier, main control circuit and LCD display was developed to detect current output value for two type electrode amperometric biosensors in selectable ranges of nanoampere. The current source module will act as a replacement for the biosensor input current. The experiment was to verified the electrical functionality measurements of the device by comparing the accuracy of the electronic reader with Keithley 2450 source meter. The Design Spark PCB software and LTspice software were used to design the electronic reader circuit. Arduino software was used to create a programming code to upload in NodeMCU microcontroller.

Design and Fabrication of Multichannel PDMS Microfluidic

M.N. Afnan Uda[1], U. Hashim[1], M.N.A. Uda[1,2], N.A. Parmin[1] and V. Thivina[1]

[1]Institute of Nano Electronic Engineering, Universiti Malaysia Perlis, 01000 Kangar, Perlis, Malaysia
[2]Faculty of Chemical Engineering Technology, Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia

Abstract. Microfluidic delivers miniaturized fluidic networks for processing liquids in the microliter range. In the recent years, lab-on-chip (LOC) is become a main tool for point-of-care (POC) diagnostic especially in the medical field. In this paper, we presented a design and fabrication on multi disease analysis using single chip via delivery of fluid with the multiple transducers is the pathway of multi-channel microfluidic based LOC's. 3 in 1 nano biosensor kit was attached with the microfluidic to produce nano-biolab-on-chip (NBLOC). The multi channels microfluidic chip was designed including the micro channels, one inlet, three outlet and sensor contact area. The microfluidic chip was designed to include multiplex detection for pathogen that consists of multiple channels of simultaneous results. The LOC system was designed using Design Spark Mechanical software and PDMS was used as a medium of the microfluidic. The microfluidic mold and PDMS microfluidic morphological properties have been characterized by using low power microscope (LPM), high power microscope (HPM) and surface profiler. The LOC system physical was experimental by dropping food coloring through the inlet and collecting at the sensor contact area outlet.

Interpretation of Piezocone Test (CPTu) on Agricultural Land for Road Foundation

*Diana Che Lat, Mohd Johan Mohamed Ibrahim, Roslizayati Razali, Noor Shazreen A. Rahman and Siti Nur Aishah Mohd Noor

Faculty of Civil Engineering, Universiti Teknologi MARA (UiTM) Pasir Gudang, 81750, Masai, Johor, Malaysia

Abstract. In geotechnical engineering design, conventional method for determining soil type and properties is by conducting laboratory test on soil samples retrieved from boreholes. However, procedures to get the soil samples and its mobilization will affect its consistency and accuracy of the data obtained. Cone Penetration Test (CPT) and Piezocone Test (CPTu) can be very effective in site characterization for soil profiling and classification directly on site. A few numbers of Piezocone Test (CPTu) were carried out to determine the soil properties along the proposed road alignment on agricultural land which consists of swampy area, oil palm and shrub. In this study, the interpretation of the Piezocone test results were executed in order to identify and classify the soil profiling at this area based on the cone tip resistance, local friction and pore pressure measured by the Piezocone.

A Hybrid Model for Synchronous and Asynchronous Learning Using the VARK Learning Style

*A A Sharip[1], R M Saidi[1], N A M Rashid[1],Z A Zulkifli [1], and A G Buja [1]

[1]Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA Cawangan Melaka Kampus Jasin, 77300 Merlimau, Melaka

Abstract. The Open and Distance Learning (ODL) environment has become a phenomenon in the education sector when the Novel Coronavirus Disease 2019 (COVID-19) outbreak strikes throughout the year of 2020. Educators attempt to find suitable approaches and to get the engagement of students during the learning process, thus, knowing the learning styles of the students is also crucial. Hence, the purpose of this study is to propose a model to facilitate students' preferences on learning styles incorporated with the synchronous and asynchronous online learning. There are four phases involved which are adopting the systematic literature review approach, conducting the descriptive statistics analysis, data analysis approach for phased two and three, and finally, producing a hybrid model of synchronous and asynchronous learning styles. As the results, a model is developed on six aspects, specifically learning styles, content delivery, activities, communication delivery, tools, and evaluation. All the elements are mapped to the VARK learning style. Both learning styles and the environment have a significant impact on the performance of each learner.

An Empirical Analysis of the Queuing Theory and Customer Satisfaction: Application in Multiple Organizations in a Same Building

*S M M Zain[1], N N A Rahid[1], A A Sharip[1], A G Buja[1], and S A Halim[1]

[1]Faculty Computer and Mathematical Sciences, Universiti Teknologi MARA Cawangan Melaka Kampus Jasin, Malaysia

Abstract. During the Coronavirus disease 2019 (COVID-19) pandemic, monitoring social distancing has become a serious problem. Most organizations are employing a number of strategies to serve their customers as the number of clients increases. In this paper, we aim to take into consideration the queuing model for client's waiting time for multiple organizations in a same building. The model is applied to obtain the best strategies to serve customer waiting time. Finally, some important queuing models are reviewed as special cases of this model. The present paper offers a review of the queuing model on social distancing for the single server queue model, Multiple-channel Queuing Models and Markovian Queuing Model. We performed a systematic literature review approach research to investigate the best model to solve queuing problem and increase customer satisfaction with safe waiting experience.

Differences in Muslim Philanthropic Behavior During the COVID-19 Pandemic Based on Demographic Factors

*M M Zaid [1], S S Salahudin [1], M A M K Nizam [1], N Rawi [1] M N Muaz [1] and M S M Taufik[1]

[1]Academy of Contemporary Islamic Studies (ACIS) Universiti Teknologi MARA Cawangan Melaka, 78000 Alor Gajah, Melaka, Malaysia

Abstract. The COVID-19 pandemic that hit the country has caused a huge impact, especially on the economic sector. The approach taken by the government in dealing with the pandemic crisis by implementing a movement control order (MCO) have, to some extent, affected the source of income of the community. In order to survive, these underprivileged people are in need of financial assistance from the government, agencies and the kind-hearted people. Islam places great emphasis on welfare, especially in helping the needy with their daily needs. Therefore, this study aims to examine the level of philanthropic behavior of Muslims during the COVID-19 pandemic as well as to analyze the differences in Muslim philanthropies' behavior during the occurrence of this pandemic based on demographic factors, namely gender, age, education level, marital status, area of residence, household income and employment sector. To achieve this goal, a total of 424 respondents had answered a set of questionnaires distributed during the movement control order (MCO) period as a time limit via a simple sampling method. The results of the study found that five out of the seven demographic factors tested, namely age, level of education, area of residence, household income and employment sector showed significant differences in philanthropic behavior among the respondents. These findings also prove that demographic factors do also influence the decision-making process to donate among Muslims in Melaka. Therefore, all parties need to take a role in explaining and providing awareness on the importance of this philanthropic activity so that the burden borne by the community affected by the COVID-19 pandemic can be eased.

Relationship Between Philanthropic Behaviour And The Level Of Muslim Generosity During The COVID-19 Pandemic

*Muaz M N[1], S.Suyurno S[1], Muhammad Taufik M S[1], Mohd Zaid M[1], Mohd Khairul Nizam M A[1] and Rawi N[1]

[1]Academy of Contemporary Islamic Studies (ACIS) Universiti Teknologi MARA Cawangan Melaka, 78000 Alor Gajah, Melaka, Malaysia

Abstract. The Covid-19 pandemic has resulted in the layoff of 24 million people around the East Asia and Asia Pacific. This amount does not include those who are not working or are unpaid during the movement control order (MCO) period in Malaysia. Thus, many are economically affected to survive throughout this health crisis. In this regard, philanthropy plays a crucial role in the Muslims' economy as one of the instruments to aid those who have been affected. The objective of this study is to identify the relationship between internal factors (religious adherence, social sensitivity, appreciation and welfare satisfaction) and external factors (media advertising, government policy, environmental influences and visibility/prestige) that influence philanthropic behaviour and the level of Muslim generosity. This quantitative study utilises a survey method using a set of questionnaires that are structured and distributed to 424 respondents during the movement control order (MCO) period in the state of Melaka. The study findings show that out of the eight internal and external factors, all four internal factors and three external factors of philanthropic behaviour are significant in the level of Muslim generosity. Only one external factor which is the visibility and prestige (VP) is not significant in the level of Muslim generosity. This means during the Covid-19 outbreak, respondents gave donation with no intention of promoting themselves and institutions. Moreover, the practice of philanthropy is not aimed to spread one's influence on the society.

A Conceptual Design of Smart Queueing Management System for Multi Organizations in Urban Transformation Centre (UTC) Melaka

*N N A Rashid[1], S M M Zain[1], S A Halim[1], A A Sharip[1] and A G Buja[1]

[1]Faculty of Computer Science and Mathematical Science, Universiti Teknologi MARA Cawangan Melaka, Kampus Jasin, 77300 Merlimau, Melaka, Malaysia.

Abstract. This paper focuses on the possibilities of using a mobile application and geofencing technique as a social distancing mechanism in developing a smart queueing system (SmartQ) for multi-organizations in the Urban Transformation Centre (UTC) in Melaka. The use of digital ticketing system, model for queueing, the relationship between geofencing technique, and social distancing practice are presented and discussed. The problem concerning the social distancing at the public area when involving in the queueing system at UTC Melaka. A conceptual model of the smart queueing application is designed.

Web-Based Collaborative Learning for Improving Students' Cognitive Thinking Levels

*N.Hamzah[1], M. F. Ahmad[1], A. Ariffin[1], N. Zakaria[1], and S. N. K. Rubani[1]

[1]Faculty of Technical and Vocational, Universiti Tun Hussein Onn Malaysia, Malaysia

Abstract. This study aimed to investigate the impact of web-based collaborative learning on students' level of cognitive processing. The assessment of the effectiveness of learning environment provided involved several instruments such as questionnaires, pre and post achievement tests. The analysis found that the low level (knowledge, understanding and application) and high level (analysis, synthesis and evaluation) of cognitive thinking increased by 35.02% and 45.22% respectively. In addition, the pre and post achievement tests also showed that the learning activity had positive impact on student achievement in the test ($p = 0.000$, $\alpha = 0.05$). In conclusion, the web-based collaborative learning provided showed positive impact on students' cognitive processing levels. The collaborative learning approach was also able to help students build more meaningful knowledge in groups compared to conventional learning approaches and individual learning.

Development of Android Application for the Islamic Principles Learning in Islamic Education for Standard One (1) Students

*N.Hamzah [1], N.S.M.Razali[1], N.S.Sollahudin[1], N. A. Sahabudin[1] and M. F.Ahmad[1]

[1]Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia
[4]Faculty of Computing, Universiti Malaysia Pahang

Abstract. Learning Five Pillars in Islamic Education in Standard One (1) encompasses the study of the five pillars of Islam that are part of a Muslim's life as well as the syllabus of standard one (1) Islamic Education in Aqidah topic. This topic contains contexts of studies that are sometimes difficult for students to understand. Therefore, this study was conducted to design and develop the Android applications that could help students to learn the principle of Islam in easy and enjoyable way. The five-phase ADDIE design model which consisted of analysis, design, development, implementation, and evaluation phases was used in developing this mobile application. The development of this application focused on three main aspects such as interface design, content design and interaction design. The use of the interface design was derived from Constantine and Lockwood's six design principles. The content design referred to the simulation learning strategies that were related to constructivism theory which required active engagement, while interaction design involved button of navigation and interactivity. Two main software namely Adobe Illustrator CS6 and Adobe Animate CS6 were mostly used in the development of this application. The application was evaluated in terms of the functionality by five experts including three (3) Creative Multimedia lecturers and an Islamic Education teacher as well as a lecturer of Islamic Studies who was also the Head of the Department of the *Pengajian Sepanjang Hayat Institut Ahli Sunnah Wal Jamaah* at University Tun Hussein Onn Malaysia (UTHM). Based on the analysis from test conducted by the five (5) experts showed that almost all experts agreed on the three main designs with regard to the development of android application for the Islamic Principles learning in Islamic Education for Standard One (1) students. The development of this app was essential to facilitate the learning of Islamic principles and to provide a new learning experience for students in learning the topic.

Expert Perspectives: 'Solveme' Web Development Based On Problem-Based Learning (PBL) Approach In Programming Fundamental Course

W.A.S.Wan Hassan[1], *A. Ariffin[1], M.F. Ahmad[1], N. Hamzah[1], S.N.K. Rubani[1], and N. Zakaria[1]

Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia

Abstract. The SolveMe website is a learning website that uses the Problem Based Learning (PBL) method. This SolveMe website was developed to give students the opportunity to develop thinking skills. This study was conducted to identify the level of functionality of the SolveMe website on three (3) aspects, namely content design, interaction design and presentation design. This SolveMe website is developed according to the ADDIE model and uses Notepad ++ software as a platform to develop the SolveMe website. The number of respondents involved in this study is four (4) experts in various fields such as PBL, multimedia and information technology. This study uses quantitative methods to collect data through a questionnaire study. The results of the data analysis showed that 100% of the experts agreed on the content design, 97.2% of the experts agreed on the interaction design and 95% of the experts agreed on the presentation design found on the SolveMe website. In conclusion, the development of the SolveMe website received positive feedback from experts.

Augmented Reality (AR) Technology in Virtual Tourism: A Study on Public Readiness During The COVID-19 Pandemic

*F I Saman[1], N Z A Rahim[1], S F M Rum[1], N I S Nasaruddin[1], K A F A Samah[1]

[1]Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA Cawangan Melaka Kampus Jasin, 77300 Merlimau, Melaka, Malaysia

Abstract. The Coronavirus Disease 2019 (Covid-19) pandemic outbreak has brought a significant impact to the tourism industry due to travel restrictions across the country and internationally. The implementation of the new norm and Standard Operating Procedures (SOPs) to contain the pandemic have also made the public avoiding travels to local destinations and overseas that could negatively impact Malaysia's tourism industry. The use of Augmented Reality (AR) technology as an alternative in delivering tourism experience has promising potentials as users can explore the places of interest without having to physically be in that place. However, before the deployment of such technology, the readiness of the public in using the technology must be measured. This research uses the Technology Readiness Index (TRI) 2.0 to measure the public readiness in embracing AR as the delivery medium for their tourism experience. Analysis revealed that the public is ready for the technology, but also anxious on how the technology can impact their lives.

Developing Higher Order Thinking Skills (HOTS) among Secondary School Students via Language Learning Strategies within Cooperative Problem-Based Learning (CPBL) Writing Activities

*S. Ismail[1], T.N.R. Mohamad Maasum[2] and N. Ahmad[3]

[1]SMK Putrajaya Presint 9 (2), Presint 9, 62250, Putrajaya Malaysia.
[2]Faculty of Social Science and Humanities, Universiti Kebangsaan Malaysia, 43600 Bandar Baru Bangi, Selangor Malaysia
[3]Industrial Linkages Section, Universiti Kuala Lumpur Malaysia France Institute, Seksyen 14, Jalan Teras Jernang, 43650 Bandar Baru Bangi, Selangor, Malaysia.

Abstract. The use of effective language learning strategies is essential for students to gradually develop their higher order thinking skills (HOTS) and this could be planned within language lessons which are incorporated with Cooperative Problem-based learning (CPBL) principles and activities. Completing writing tasks assigned based on scenario and problems requires students to engage in learning strategies and use thinking processes to overcome the challenges of seeking for and using information in composition. The objective of the study is to investigate how language learning strategies adopted by students developed HOTS in the CPBL English writing classrooms . This qualitative case-study based on purposive sampling study was conducted on thirteen upper secondary form four students from an urban school as a case study site. The data was elicited via structured reflective journal, class observations and interviews gathered throughout the 12 weeks used to run the CPBL for writing that centred around themes like science and technology, social issues and environment as the problem scenario. The study revealed that the students applied ten types of language learning strategies that fall under the cognitive, social and compensation category that developed their HOTS for writing. The HOTS gradually developed during the three CPBL phases of the writing lessons are analysing, evaluating and creating. This study also provided insights into the strategies that English teachers should focus on in writing classrooms to develop students' HOTS.

Transformation of Thinking–Aloud in Assessing Hands-on Psychomotor: Preliminary Study

*NSS Mizam[1], ZB Razali[1], MH Daud[1] and MMA Kader[1]

[1]Faculty of Electrical Engineering Technology, Universiti Malaysia Perlis, KampusUniCITI Alam, 02100 Padang Besar, Perlis, Malaysia.

Abstract. Evaluation of laboratory experiences of engineering and engineering technology students has led to an increasing in the attention being paid to the development of students' psychomotor skills. One of the reasons that psychomotor seems to be less critical in the past is the lack of suitable measuring tools. However, it is essential in the engineering and engineering technology course. Furthermore, a current assessment using report and test to evaluate student practice experience in the laboratory only helps assess students' cognitive skill knowledge. Thus, a new study method is needed to evaluate engineering technology students' understanding of the component called 'hands-on practical experience' during their practical skill classes or experiment. The existing technique for evaluating psychomotor abilities that have emerged from attempts to improve selection in recruitment processes may provide a potentially useful tool for such a purpose. This study aims to create a new approach to test a practical experience change to assess unintentional learning related to classic psychomotor skills in engineering technology laboratory classes. The methodology used to build up the instrument is portrayed, and the empirical data collected to support its validity is presented. Thus, this research aims to find a way to measure the practical skill involve in a psychomotor change in an engineering laboratory class.

Assessing Fundamental Hands-on Psychomotor for Electrical Electronics Undergraduates: Preliminary Study

*N.S.S. Mizam[1], Z.B. Razali[1,2], M.M.A. Kader[1,2] and N.S.S.R. Affendi[1]

[1]Faculty of Electrical Engineering Technology, Universiti Malaysia Perlis, KampusUniCITI Alam, 02100 Padang Besar, Perlis, Malaysia.
[2]Center of Excellence, Sports Engineering Research Center (Electronics), Universiti Malaysia Perlis, 02600 Arau, Perlis, Malaysia.

Abstract. Evaluation of laboratory experiences of engineering and engineering technology students has led to an increasing in the attention being paid to the development of students' psychomotor skills. One of the reasons that psychomotor seems to be less critical in the past is the lack of suitable measuring tools. However, it is essential in the engineering and engineering technology course. Furthermore, a current assessment using reports and tests to evaluate student practice experience in the laboratory only helps assess students' cognitive skill knowledge. Thus, a new study method is needed to evaluate engineering technology students' understanding of the component called 'hands-on practical experience' during their practical skill classes or experiment. The existing technique for evaluating psychomotor abilities that have emerged from attempts to improve selection in recruitment processes may provide a potentially useful tool for such a purpose. This study aims to create a new approach to test a practical experience change to assess unintentional learning related to classic psychomotor skills in engineering technology laboratory classes. The methodology used to build up the instrument is portrayed, and the empirical data collected to support its validity is presented. Thus, this research aims to find a way to measure the practical skill involve in a psychomotor change in an engineering laboratory class.

A Review of Global Human Resource Management in Navigating the COVID-19 Pandemic

*Siti Sarah Omar[1], Ahmed Al Shameri[1], and Jun Hui[1]

[1]Department of Business Management, Faculty of Technology Management and Business, Universiti Tun Hussein Onn Malaysia, Parit Raja Batu Pahat Johor

Abstract. The epidemic of COVID19 has been unexpected for the global companies, leaving them in a challenging time trying to navigate the impact. It has changed the daily routine to a crisis response situation. It has been demonstrated that the Global Human Resource Management are prominence in such critical situations. The objective of this paper is to review the functions, management methods, management perspectives and management complexity of the Global HRM of organisations during the pandemic COVID-19. The paper shows that it is harder for the Global companies to navigate COVID-19 than the local enterprises with regard to managing their human resources. Besides, it has shown that Global HRM should consider the external factors such as cultural differences, economics and rules and regulations during this epidemic time. The contribution of this paper is its focus on the functions and strategies of global HRM to navigate the pandemic COVID-19.

Preliminary Survey of the Distribution of *Corbicula fluminea* (Muller, 1774) in Thailand

*E R Aweng[1], A B Arham Muchtar[1], H S Sukree[2], M A Salam[2], S O Sharifah Aisyah[1], A Azlan[3], H Zulhazman[1], A Mohammad Amizi[4], and A L Zul Ariff[4]

[1]Faculty of Earth Science, Universiti Malaysia Kelantan, Locked bag No. 100, 17600 Jeli, Kelantan, Malaysia.
[2]Department of Environmental Science and Disaster Management, Faculty of Science, Noakhali Science and Technology University, Noakhali-3814, Bangladesh.
[3]Prince of Songkhla University, Pattani Campus, 181 หมู่ที่ 6 Charoen Pradit Rd, Rusamilae, Mueang Pattani District, Pattani 94000, Thailand.
[4]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia.

Abstract. *Corbicula fluminea* is a small-sized shellfish that lives in the river or at the bottom of a lake. This species is very sensitive to changes to their habitat. Today, there are numerous threats to the *Corbicula fluminea* habitat, especially river pollution. In central, north-eastern and southern part of Thailand, the habitat of *Corbicula fluminea* is greatly disrupted by agriculture activities and the flow of pesticides from agriculture area into rivers. In order to find out where *Corbicula fluminea* can be found in Thailand, a survey was conducted in central, north-eastern and southern part of Thailand. However, the other part of Thailand was not covered by this research due to financial and time constraint. The method utilised was by obtaining information from the villagers by means of informal conversational interview and observations, followed by the sampling collection conducted by the researchers using a special tool. The coordinate of each location where was recorded using the Garmin model GPSmap 62. Meanwhile, the digital calliper was used to measure shell height (H) and length (L). The results show that there is still a location from one river which is Ping river from the central part of Thailand and 3 places from 2 rivers which are Mun and Chi rivers from the north-eastern part of Thailand, where the *C. fluminea* can still be found. On the other hand, there are four places from three rivers, namely Pattani, Saiburiand Ka Lae Ku Bo rivers in the southern part of Thailand, where *C. fluminea* was collected. Meanwhile, from the survey results, it clearly shows that the outer shell colour of *C. fluminea* depends on the type of substrate but not influenced by the land use. This data is expected to be used by the authorities responsible for finding conservation and restoration methods to ensure that *C. fluminea* does not disappear from Thailand. Besides, the data can also help to ensure that the source of income of traditional fishermen who depend on *C. fluminea* is not affected.

Issues Related to The Non-Revenue Water (NRW) Management in Kelantan, Malaysia

*I Mohammad Ghazi[1], E R Aweng[2], A R Haliza[3,4)], C L Nur Farhana[5], and A L Zul Ariff[6]

[1]Dr, Mohammad Ghazi Professional Training & Consultancy, Lot 8113, Tingkat 1, Bandar Satelit Pasit Tumboh, 16150 Kota Bahru, Kelantan
[2]Faculty of Earth Science, Universiti Malaysia Kelantan, Locked bag No. 100, 17600 Jeli, Kelantan, Malaysia.
[3]Institute of Social Science, Putra Infoport, Universiti Putra Malaysia, 43400 Serdang, Selangor, Malaysia
[4]Department of Environmental and Occupational Health, Faculty of Medicine and Health Sciences, Universiti Putra Malaysia, 43400, Serdang, Selangor, Malaysia
[5]Faculty of Medicine, Universiti Sultan Zainal Abidin (UniSZA), Kampus Perubatan, Jalan Sultan Mahmud, 20400, Kuala Terengganu, Terengganu Darul Iman, Malaysia
[6]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia.

Abstract. *Non-Revenue Water (NRW) is one of the most important subjects in many countries around the globe including Malaysia. A higher NRW value means higher water loss. In Malaysia, Kelantan is one of the states, which is having a high total mean NRW value, which means this state is also facing a high water loss rate. A study was carried out to understand the issues related to the NRW management In Kelantan, Malaysia. The research was conducted in Bechah Tendong, Kelantan. DMA Bechah Tendong involves 8 different areas such as Tendong Road, Kubang Bunut, Tendong Hilir, Taman Sri Embun, Kubang Pak Amin, Kg. Serdang, Kg. Endong Mosque and Pasir Mas Polyclinic. Document review, observations, interviews, and questionnaires were used to determine, study, understand, and evaluate the issues and the main problem in NRW management. The questionnaire contains 5 domains i.e character, politics, laws, economy, and technical. The study revealed the issues related to the NRW Management in Kelantan were knowledge on NRW, involvement in NRW, knowledge-sharing method on NRW, difficulties to get involved in NRW, and job-execution issue. The issues can be further understood by looking at the themes under each highlighted issue*.

Proximate Analysis of Smoked Etak (Corbicula flueminea) Tisssue

*Z Bibi Zafirah[1], M A Salam[2], D Shaparas[1], Lee Seong Wei[3], A Azlan[4], H Zulhazman[1], A Mohammad Amizi[3], A L Zul Ariff[3], and E R Aweng[1]

[1]Faculty of Earth Science, Universiti Malaysia Kelantan, Locked bag No. 100, 17600 Jeli, Kelantan, Malaysia.
[2]Department of Environmental Science and Disaster Management, Faculty of Science, Noakhali Science and Technology University, Noakhali-3814, Bangladesh.
[3]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia.
[4]State Department of Environment Kuala Lumpur, 3, Sungai Besi Road, Pudu, 55200 Kuala Lumpur, Federal Territory of Kuala Lumpur

Abstract. In Kelantan State, Malaysia people consumed smoked *Corbicula fluminea*, as a special snack. Smoked *Corbicula fluminea* is raw Asian clam that is marinated by using salt, sugar, garlic, shallots, lemongrass, ginger and monosodium glutamate (MSG) being subjected to the smoking process. So far, people consumed it without knowing the nutritional contents of them. Therefore, this study aims to determine the proximate composition (moisture, ash, crude fat, crude protein and carbohydrate) of *C. fluminea*. The present study focused on the proximate composition in *C. fluminea* soft tissue that has undergone the smoking process in a modified oven, with optimum temperature, airflow and time. Proximate composition was analysed according to the Association of Official Analytical Chemists standard method (AOAC). Based on the analysis, the ranged of moisture content (MC) in Pasir Mas station is between 76.16±2.72 – 78.60±1.66% and Tumpat station between 76.13±2.22 – 79.30±2.09% ,ash content (AC) between 3.12±1.21 – 3.70±0.95% (Pasir Mas) and between 2.96±0.73 – 3.69±0.84 (Tumpat). On the other hand, crude fat (CF) content between 7.92±1.26 – 9.59±1.31% (Pasir Mas) and between 7.71±1.30 – 8.99±1.70% (Tumpat). Crude protein (CP) was recorded between 8.00±0.82 – 8.64±0.66% (Pasir Mas) and between 7.91±0.51 – 9.05±0.67% (Tumpat) and carbohydrates content (CC) was recorded between 1.44±1.33 – 3.14±1.48% (Pasir Mas) and between 1.57±1.01 – 2.83±1.24% (Tumpat). In conclusion, smoked *C. fluminea* is good to eat because it has high proximate elements and does not harm the health of its fans.

Autonomous Electromagnetic Two-Speed Gearbox for Future Electric Vehicle

* Hasan MD Nurul[1], and Ataur Rahman[1]

[1]Department of Mechanical Engineering, International Islamic University Malaysia 50728 KL, Malaysia.

Abstract. The goal of the National Automotive Policy (NAP) 2020 is to develop advanced automotive technologies related to Mobility-as-a-Service, Next-Generation Vehicle (NxGV), such as Electric Vehicles (EVs) / Conditional Autonomous Vehicles (CAVs), and Industrial Revolution (IR) 4.0. Prototyping technologies for NxGVs with improving energy efficiency and autonomous will be the perspicuous future mobility in Malaysia. Conventional transmissions such as automatic transmission (AT), manual transmission (MT), and / or continuously variable transmission (CVT) for NxGV will cause energy consumption due to their bulkiness and difficulty to install directly with the EV's motor-head. In addition, the single-speed gearbox (SS-GB) is lighter, but not suitable for generating enough torque at start-up or when going uphill. Therefore, the development of a compact and autonomous energy-efficient transmission is a key technological issue for NxGV. The aim of this research is to fabricate a prototype of a compact and lightweight autonomous electromagnetic two-speed gearbox (AEM2SGB) for EV in accordance with NAP-2020 and IR4.0. The first-gear is for acceleration in uphill, which will provide high torque, and the second-gear is for higher speed. A laboratory experiment was conducted using equivalent road-loads. It is found that the AEM2SGB's shift times in first gear to be 1.5 seconds with a higher torque of 3000 Nm and 1.8 seconds in second gear for 110 km / h with supplying current in the range of 12-16A. AEM2SGB will reduce the NxGV's transmission-weight about 40-50% and improve the NxGV performance by 30% and improve battery life by 15%.

Strength of concrete containing partial coarse recycled concrete aggregate and synthetic conductor wire waste

*F S Khalid[1], M Y Aliff[1], J M Irwan[1], S H Saaidin[1] , A N Abdullah AlGebri [1] Z Zaki[1] and S Ayob[1]

[1]Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, MALAYSIA.

Abstract. The demand for concrete in the construction field is growing as linear with the growth of Malaysia economy. This tendency is expected to continue in the year ahead because of improvement in technology. This study tends to determine the performance of partial coarse recycle concrete aggregate containing synthetic wire waste as fiber materials can reduce the amount of waste dumped into landfills. The increasing amount of wire waste which is uncontrollable may lead to environment issue. Until today there is no researches have done the studies on the performance of concrete containing combination of coarse recycle concrete aggregate (CRCA) and synthetic wire waste as materials. Therefore, an action is made to overcome the environmental problems by using coarse recycle concrete aggregate and wire waste as materials in the concrete mixture. The amount of CRCA were added into concrete mixture is 10%, 15% and 20% otherwise, wire waste added into concrete mixture is limited to 0%, 0.5%, 1.0% and 1.5% respectively. Other than that, the water-cement ratio that used is 0.55. The test that involves in this study is workability, density, compressive strength, and tensile strength tests. The compressive strength test was be carried at the ages of 7 and 28 days and for tensile strength test were carried at the ages of 28 days. At the end, the result of density, compressive and tensile tests for 15% of CRCA and 1.5% of wire waste was the best value compared with normal mix. Thus, it was the optimum percentage that effective to be used in concrete.

Density, Compressive Strength and Water Absorption Performance of Sand Cement Brick Containing Recycled Concrete Aggregate and Crumb Rubber

*F S Khalid[1], M Y Aliff[1], J M Irwan[1], S H Saaidin[1] , A N Abdullah AlGebri [1] Z Zaki[1] and S Ayob[1]

[1]Faculty of Civil Engineering and Built Environment, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor, MALAYSIA.

Abstract. There lot of studies have been conducted in order to replace the fine aggregate in which natural fine aggregate replace with the waste material in concrete preparation. Therefore, this research was used a combination between RCA and CR as a partial of sand replacement materials in the sand cement brick. The aim of this research is to study the performance of sand cement brick that containing combination of RCA and CR as partial sand replacement materials in term of density, compressive strength and water absorption. A total of 144 brick specimen were prepared and mix with different percentage of RCA and CR as a partial sand replacement material. The design replacement of RCA was 0%, 15%, 30% and 45%, while CR was 0%, 2%, 4% and 6%. Other than, W/C ratio that used in this research was 0.6 for 28 days age of curing. Based on the result, the percentage of water absorption was increase after increment of CR while RCA after 30% of replacement. In addition, percentage of compressive strength and density was decrease after increment of CR while RCA after 30% of replacement. Throughout this research, brick that containing 30% of RCA and 2% of CR showed the optimum mix design where it shows the highest percentage of compressive strength and lowest in water absorption compared to another mix design. It is potentially to applicable the RCA and CR as secondary sources of natural fine aggregate and also can reduce waste of RCA and CR in Malaysia.

Relationship of Grain Size & Shape Factor of Nickel Aluminium Bronze at Different Cavity Thickness

*M Nasuha[1], M.M Rashidi [1], A. Hadi [1] , Z Shayfull[2], T M Sheng[1]

[1]Faculty of Mechanical and Automotive Engineering Technology, Universiti Malaysia Pahang, Kampus Pekan, 26600, Pahang, Malaysia.
[2]School of Manufacturing Technology, Universiti Malaysia Perlis, KampusTetap Pauh Utara, 02600 Arau, Perlis, Malaysia.

Abstract. The purpose of this study is to develop the customized connecting rod based on NAB alloy. Later the relationships of alloy's grain size with its shape factor, at different section of connecting rod mainly at large, medium and small were compared to cooling rate. Several parameters such as NAB's composition (based on ASTM B148 UNS C95800), the type and amount of degassing agent used, the microstructure behavior of NAB such as the effect of cooling rate to the grain size, DAS and SDAS of NAB alloy was also investigated. The experiment included optical microscope equipment for microstructure and SEM/ EDS observation to determine the grain size and distribution which may relate to its cooling rate. The experimental result shows that the grain size and shape factor are significantly depend on the cooling rate where is, slower cooling rate will produce more fine grain and microstructure. The same trend also observed in the grain size which is highly depend on the cooling rate. The higher the cooling rate, the smaller the grain size of the NAB connecting rod.

Effect of different thickness on the microstructure and morphology of nickel aluminium bronze alloy castings

*M Nasuha[1], M.M Rashidi [1], A. Hadi [1] , Z Shayfull[2], T M Sheng[1]

[1]Faculty of Mechanical and Automotive Engineering Technology, Universiti Malaysia Pahang, Kampus Pekan, 26600, Pahang, Malaysia.
[2]School of Manufacturing Technology, Universiti Malaysia Perlis, KampusTetap Pauh Utara, 02600 Arau, Perlis, Malaysia.

Abstract. The purpose of this study is to develop the customized connecting rod based on NAB alloy. Later, the microstructure and morphology at different section of connecting rod mainly at large, medium and small were compared to cooling rate. By preparing NAB's alloy composition (based on ASTM B148 UNS C95800), the type and amount of degassing agent used, the microstructure behavior of NAB such as the effect of cooling rate to the grain size, DAS and SDAS of NAB alloy was also investigated. The experiment included optical microscope equipment for microstructure and SEM/ EDS observation to determine the grain size and distribution which may relate to its cooling rate. composition during melting stages as the variable parameters, investigation of its effect on microstructure was approached. Specimen was selected, cut, prepared and investigate by optical and scanning electron microscope. Based on the results, the alloy morphology is a dendritic structure. The fracture surface also reveals inter-granular fracture between the dendritic structure and its grain boundaries.

Unprecedented disruption of higher education: technology readiness and productivity of working academics during COVID-19 Outbreak

*N Rezali[1], Y S M Yunan[1] and S N L Ibrahim[3]

[1]Politeknik Tuanku Syed Sirajuddin, Pauh Putra; 02600 Arau; Perlis, Malaysia.
[2] Kolej Komuniti Jelebu, Jalan Seperi, 71600 Kuala Klawang, Negeri Sembilan.

Abstract. This paper explores the disruption factor of practising WFH towards productivity that affected higher education in Malaysia during the outbreak of COVID 19. There is a disagreement with the WFH itself, but this impact can be mitigated or even reversed when people prefer integration. This research analyzed, reviewed and clarified in depth the technology readiness factor from previous studies. For the sake of a lack of understanding, this paper acknowledges and discusses the conceptual practice of working from home that contributes to productivity in higher education in a single setting in developing countries. This research examined the factor of the technology readiness of WFH that affect the productivity of Malaysia's higher education learning. The analysis findings will shed some light on our perception of the problematic technology readiness element in WFH practice. It also offers the current information corpus to researchers and a pledge to extend the study stream on WFH processes. It also provides researchers with the existing corpus of knowledge and promises to expand the research stream on WFH practices. The empirical findings will suggest the challenge of technology readiness during working from home and how to face it by the academician in possible ways to obtain considerable potential for improving productivity a higher education institution in Malaysia.

Treatability studies of stabilised leachate via coagulation-flocculation process using agro-waste (*Manihot esculenta* peel extract) as a coagulant aid

*S N A Mohd-Salleh[1] M Z N Shaylinda[1], N Othman[1], G Yashni[1], A B Norshila[1,2]

[1]Faculty of Civil Engineering and Built Environment, Universiti Tun Hussien Onn Malaysia, 86400 Parit Raja Batu Pahat, Johor, Malaysia.
[2]Department of Civil Engineering, Politeknik Sultan Abdul Halim Mu'adzam Shah, Bandar Darulaman, 06000 Jitra, Kedah, Malaysia

Abstract. Agro-waste can be commercialised into another useful product such as natural coagulant for wastewater treatment. The purpose of this study was to investigate the ability of agro-waste (*Manihot esculenta* peel extract (MEP)) as an aid alongside the utilisation of chemical coagulant (polyaluminium chloride (PAC)) at the optimum coagulant dose and pH of stabilised leachate. Series of jar tests were used to compare the leachate treatments using single and the dual coagulant of PAC and MEP. Leachate treatment using the application of single PAC coagulant at the optimum conditions of 375 mg/L dose and pH 6.0 of leachate, managed to remove about 54.1%, 28%, 91.1%, 98%, and 98% for chemical oxygen demand (COD), ammonia nitrogen (AN), turbidity, colour, and suspended solids (SS), respectively. Meanwhile, by using dual coagulant at the optimum doses of 3500 mg/L (PAC) and 250 mg/L (MEP), and pH 7.0 of leachate, the treatment achieved higher removal except for colour parameter. The removal was 58.3% of COD, 34% of AN, 96.9% of turbidity, 92.1% of colour, and 99% of SS. The application of MEP as coagulant aid also managed to reduce the Al content in PAC dose from 577.5 mg/L to 539 mg/L without affecting much of its efficiency.

Characterization Of Different Varieties Of Commercial *Malus Pumila* (Apple Cider) And *Punica Granatum L.* (Pomegranate) Vinegars In Malaysia Market

*M Seri Intan[1], A Mohammad Amizi[1], Chan Jian Wen[1], M Nursalwani[1] and A L Zul Ariff[1]

[1]Faculty of Agro Based Industry, University Malaysia Kelantan, Campus Jeli, 17600 Jeli, Kelantan, Malaysia.

Abstract. Commercial fruit vinegar is recently produced with different vinegar process to develop more varieties of product for satisfying the needs of customers. However, there are limited knowledge existed on the effect of different vinegar processing based on physicochemical properties and nutritional values. In this research, different varieties of *Malus pumila* (apple cider) and *Punica Granatum L.* (pomegranate) vinegars were studied. Artificial vinegar was used as control. The effect of different varieties of vinegar are studied based on physicochemical properties and acetic acid content. In analysis of physicochemical properties, unfiltered vinegars had higher °Brix value and titratable acidity than the other samples. pH of all the samples were similar with the commercial vinegar. Artificial vinegar had low acetic acid content, but unfiltered vinegars had higher acetic acid content. The data in this research provided the fundamental scientific evidence of nutrition value for different varieties of vinegars. This study was meant to provide guide for consumers to purchase and consume a high quality and nutritional fruit vinegar among numerous varieties of commercial fruit vinegars in Malaysia market.

Boom Stiffening Effect on Long Arm Excavator Performance under Maximum Breakout Condition

*M S A Rashid[1], C-M Chan[1], M F Shaari[1], A Liew[2] and M Z Rosman[1]

[1]*Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, 84600, Pagoh, Johor, Malaysia*
[2]NTL Masters Sdn. Bhd, Jalan Bindu, 83000 Batu Pahat, Johor, Malaysia

Abstract. The boom is considered the most critically affected part of Long Arm Excavators in severe work conditions, where high forces and unpredictable environmental elements at the worksite could severely affect the machine's overall performance. A potential solution to improve the boom's robustness is via stiffening. As an industrial collaborative project, the present study examined the performance of an existing machine via simulated improvement of the boom with such an approach, i.e. incorporation of stiffeners on the boom. Simulation works were carried out with Ansys Workbench 19.2 to assess the boom's performance in terms of resulting stress, strain and deformation under a series of stiffening configurations, which included varying the dimensions and positions of the stiffeners on the boom. The improved conditions were Improvement I: stiffener's thickness reduction to 10 mm, Improvement II: a combination of different stiffener's thickness reduction to 10 and 8 mm at critical and non-critical parts of the boom, Improvement III: removal of half intermediate 12 mm thick stiffeners, and Improvement IV: removal of half intermediate 8 mm thick stiffeners. From the analysis, it was found that the maximum equivalent stress of the boom decreased with the number of stiffeners incorporated. The combination of different stiffener's thickness could also increase the boom's strength while decreasing the maximum equivalent stress. The lowest maximum equivalent stress of the boom was achieved via Improvement II with a reduction of 26.1%. Removal of non-critical part stiffeners also kept stress values under the designated stress limits against fatigue failure, i.e. 44 MPa. In summary, performance optimisation appeared to be achievable with improvement II.

Young Entrepreneurs Participation in Halal Food Products: A Conceptual Paper

*M Nursalwani[1], A Mohammad Amizi[1], E R Aweng[2], H Zulhazman[2], A Palsan Sannasi[1], and A L Zul Ariff[1]

[1]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia.
[2]Faculty of Earth Science, Universiti Malaysia Kelantan, Locked bag No. 100, 17600 Jeli, Kelantan, Malaysia

Abstract. The paper aims to study more about young entrepreneur participation toward halal food industry. Many studies stated that halal food industry demand is growing rapidly in both Malaysia and global. The current situation in Malaysia is precisely targeting the youth to act as organizer and participant in Malaysia halal food industry. The factors which may influence the participation of young entrepreneurs includes job happiness, intention, perception, attitude, social norms, perceived behaviour, and financial.

Consumer Attitude Towards Halal Integrity on Halal Food Supply Chain Product

*A L Zul Ariff[1], A Mohammad Amizi[1], E R Aweng[2], H Zulhazman[2], A Palsan Sannasi[1], and M Nursalwani[1]

[1]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia.
[2]Faculty of Earth Science, Universiti Malaysia Kelantan, Locked bag No. 100, 17600 Jeli, Kelantan, Malaysia.

Abstract. Food products as well as Halal food products now travelled a greater distance and involved a lot of handling before it reaches its final point of consumption. This circumstance has made unpredictability regarding the legitimacy of the Halal status and whether the nourishment items still stay Halal. The objective of this research was to determine the relationship between consumers' religion and attitude of the consumer towards halal integrity in the food supply chain product. This study used a cross-sectional study with a survey method via a questionnaire, which involved 100 consumers at Malaysia International Halal Showcase (MIHAS) exhibition in Kuala Lumpur that were chosen by a convenience sampling technique. The results show that there was a significant difference between the consumers' religion and attitude of the consumer towards halal integrity in the food supply chain product.

The Understanding of Construction Players Towards The Implementation of Knowledge Management in Conservation Contractor Companies

*S Abdullah[1], S Ismail[1], and K A Mat Daud[2]

[1]Faculty of Architecture and Ekistics, Universiti Malaysia Kelantan, 16300 Bachok, Kelantan
[2]Faculty of Creative Technology and Heritage, Universiti Malaysia Kelantan

Abstract. Knowledge Management (KM) can be used as a structured and usefull approach by construction companies to facilitate construction players to improve performance as well as to face the challenges as its uses in other commercial sectors. However, in Malaysia limited research has been undertaken in order to explain the process of implemeting KM in constrution environment, especially in conservation contractor companies. This study has been done in order to determine the understanding level of constrution workers in conservation contractor companies towards the concept and application of KM. It is crucial to find out the understanding level of construction workers since they will role as the key players which significantly affect the KM implementation performance. The survey method has been applied in order to collect the related data, where the questionnaire form has been used as a research instrument. In overall, this study found there is a good level of understanding towards the concept and application of KM among the employees who are serving in conservation contractor companies. The level of understanding is high especially on the basic concepts of KM. However, the level of understanding tends to go down to the medium level when it is related to the KM process or application. A moderate level of understanding also occurs, when it deals with needs of construction industry to implement KM. These findings may provide a new action plan for KM implementation team in introducing KM approach in their respective organizations

Occupational Safety and Health Management Practice Among Employers: Awareness to Integrate Safety Training Programme Required Under Osha

*S F N S Mhdzar[1], S Abdullah[2], A A Razak[1]

[1]School of Housing Building and Planning, Universiti Sains Malaysia, 11800 Pulau Pinang
[2]Faculty of Architecture and Ekistics, Universiti Malaysia Kelantan, 16300 Bachok, Kelantan

Abstract. Occupational Safety and Health issue at the workplace has always been a major concern especially among the established contractors, because poor management can cause accidents and can further affect the business. Even though currently there have been decreasing rates of accidents related to death, the employer should not overlook the need of having training programmes for the employees. This is because, the occurrence of accidents is still happened, and yet the level of awareness and practicability of such regulation among employers is not satisfactory. The objective of this research is to investigate whether the top management of the selected construction companies are aware of their responsibility in response to the safety and health requirements by OSHA 1994 (Act 514), and the barriers of safety training programmes. Clearly, the responsibility of the top management is the most crucial. The study was conducted among 105 Grade 1 and Grade 2 contractors in Penang Island through the method of questionnaire survey. The findings indicate that the level of awareness of the respondents on provision for safety training as required under OSHA 1994 (Act 514) is still at an average level. Additionally, the study revealed that the most significant constraints to safety training programmes are, the top level management prefers the money to be spent on meeting other necessities than to allocate it for training, they prefer workers' experiences, time consuming training process and location of training place. Further to this, the study also highlights some recommendations to improve the training programmes.

The Determinants of Happiness: Evidence from a Panel Data Approach

*M F Ghazali[1], M Z Muhammad[2], N Ahmad[3] and B Rathakrishnan[4]

[1]Faculty of Economics and Management, Universiti Kebangsaan Malaysia, 43600 Bangi, Selangor, Malaysia.
[2]Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, Jalan Pengkalan Chepa, 16150 Kota Bharu, Kelantan, Malaysia.
[3]Labuan Faculty of International Finance, Universiti Malaysia Sabah, 87000 Labuan, Malaysia.
[4]Faculty of Psychology and Education, Universiti Malaysia Sabah, 88400 Kota Kinabalu, Sabah, Malaysia.

Abstract. This research aims to investigate the socioeconomic and health-related determinants of happiness across the countries from 2006 through 2017. We classify the countries based on the income levels, i.e., high-income countries (HICs), middle-income countries (MICs), and low-income countries (LICs). Based on the fixed-effect models, this study finds that income plays a significant role in influencing the level of happiness in all classification countries, which unable to confirm the Easterlin Paradox claim that more income does not bring better happiness. The unemployment is negative and statistically significant in HICs and MICs, but statistically insignificant positive in the LICs. Furthermore, this study also reveals that healthy life expectancy is significant only in the MICs and LICs. Finally, corruption perception is significantly negative correlated with happiness in the MICs. This study concludes that while it is vital to emphasize resorting to income-boosting economic policies, creating job opportunities and human relationships should not be sacrificed in order to improve the happiness level.

The Effect of Utilitarian-Based Online Store Attributes, Hedonic-Based Online Store Attributes, and Online Review Towards Online Impulse Buying Behaviour in Malaysia: A Review

*L M Hong[1], N Che Nawi[1], and Wan Zulkiffli[1]

[1]Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, 16100 Kota Bharu, Kelantan, Malaysia

Abstract. Majority of Malaysian use the Internet mainly for searching information of the product and services as their main activity even though they are not interested to purchase that through online. Their preferable are shopping at traditional store. This scenario showing that online platform is just a convenience channel for them to gather related information only. In order to remain competitive, retailers need to shift their business into digital business and one strategy to boost online sale is using the impulse buying method. Therefore, there is a need to further investigate what factor affecting the online impulse buying. To note, factor such as utilitarian-based online store attributes, hedonic-based online store attributes, and online review are found significantly affect online impulse buying behaviour.

FARMERS' TRAITS AND ORIENTATIONS ON THE PERCEPTIONS OF CAPS ATTRIBUTES AND ADOPTION OF CAPS

*Naeem Hayat[1], C N Noorshella[2], Al M Abdullah[3], B Sudesh[3] and AP M Umathevi[3]

[1]PhD Candidate, Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, Pengkalan Chepa, 16100 Kota Bharu, Kelantan, Malaysia
[2]Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, Pengkalan Chepa, 16100 Kota Bharu, Kelantan, Malaysia
[3]Faculty of Business and Management, UCSI Universitty, Malaysia. No. 1, Jalan Menara Gading, UCSI Heights (Taman Connaught), Cheras, 56000 Kuala Lumpur, Malaysia

Abstract. Changing climatic conditions and growing world population are two significant challenges in recent times. The global food system has contributed to greenhouse gases (GHGs) emissions, and the current food production practices are unsustainable. Sustainable food systems require a change in current intensive farming practices, such as conservative agriculture practices (CAPs). The low adoption of CAPs motivated the study of CAPs adoption at a different level and factors. This study explores the role of farmers' personal factors, namely age, education, and experience, to adopt and use CAPs with their capacities of innovativeness, risk-taking, environment orientation, profit orientation, and trust in extension services. The data collected through a field survey from 336 rice farmers in Punjab, Pakistan. SmartPLS exploited for data analysis. Multiple group analysis (MGAs) technique utilized to compare the farmers' data based on their age, education, and experience. The analysis results indicate that perception of trust on extension and environment orientation fluctuates significantly according to personal factors, such as age, perception of trust on extension, and profit orientation. Besides, the farmers' education and farming experience have a different impact on their perception of profit orientation and environmental orientation. Young and educated farmers are more inclined towards the use of CAPs. To promote CAPs adoption, governments should attract young and educated farmers by providing training and promoting facilitating. The extension role should extend the services at the grassroots level to achieve mass adoption. This study presents study limitations, future research opportunities, and policy recommendations.

Dynamism of HR Strategy Through Academic Person-Environment Fit Towards Sustaining Work Life Balance And Reducing Intention To Leave: A Review

*A S Roselina [1], C N Noorshella[1], Z Noor Raihani[1], and P Yukthamarani[1]

[1]*Faculty of Entrepreneurship and Busines, Universiti Malaysia Kelantan, City Campus, 16100 Kota Bharu, Kelantan, Malaysia.*

Abstract. Attracting and retaining quality talents in the industry has becoming the main topic of discussion among corporate leaders and hr practitioners. In education industry, the attrition rate of academics continues to rise. Turnover among academics in Malaysia was 12 percent in 2015 and had increased to 18 percent in 2016 is expected to rise further. Despite the high unemployment rate (3.5 percent), universities are facing great challenges to attract good talents and also retaining quality talents. The changes in life style and working environment lead to different HR landscape. The new role of HR requires to look at values development, work life balance mechanism and appropriate retention strategy. The frustration among the academics are mainly due to incompetent academic leadership, poor facilities to promote scholarly culture, high bureaucracy, poor reward system, poor career development programmes, internal politics, and stringent performance indicators. These have caused dissatisfaction, low morale and many to leave the universities for greener opportunities. This issue is centred on HR management. Therefore, the study aims to investigate the dynamic of HR strategy to affect work life balance and intention to leave among the academics in Malaysia. HR strategies will include organizational reputation, vocational prestige and person environment fit (PEF) strategies. Perception towards the image (prestige) of an organisation and the task will be new contribution to the field of HRM. Fundamentally, the study will fill the gap in HRM literature by focusing on factors that affect retention strategy.

Key Drivers of Smart Mobility Adoption In Smart City : A STEEPV Analysis

*E Wahab[1], Z Ali[2], C J Jen[1]

[1]Faculty of Technology Management and Business, , Universiti Tun Hussein Onn Malaysia,, 86400 Batu Pahat, Johor, Malaysia.
[2]Centre For Diploma Studies, Universiti Tun Hussein Onn Malaysia, Pagoh,, 86400 Muar, Johor, Malaysia.

Abstract. The purpose of this research is to identify the key drivers of smart mobility adoption in smart city in Malaysia. STEEPV analysis had been used to identify the key drivers of smart mobility adoption in smart city. The STEEPV analysis is a foresight tools that brainstorm the factors based from social, technology, economic, environment, political as well as value perspective. This result of STEEPV analysis found that technological factors has the most influencing factors that determine smart mobility adoption in smart city.

Nursery Entrepreneur Intention towards Being An Orchid Entrepreneur

*A L Zul Ariff[1], H Zulhazman[2], M R Raimi[1], M Nursalwani[1] and K Fatimah[1]

[1]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia.
[2]Faculty of Earth Science, Universiti Malaysia Kelantan, Locked bag No. 100, 17600 Jeli, Kelantan, Malaysia.

Abstract. Nowadays, the orchid business gains attention as it has become one of the high-value ornamental flowers and has increased the country's economy. It also generates a lot of business and jobs, since the government and non-governmental agencies are very involved in this field. This industry creates an opportunity for nursery entrepreneurs to join and become orchid growers as Malaysia already export orchid RM11.9 Million in the year 2015. However, some people refuse to take high risks by growing an orchid flower as it is very sensitive and needs intensive care. The government should give knowledge and awareness to the nursery entrepreneur about the orchid industry to attract them into this industry because low risks business would not give a big return in the future. This research use Theory of Planned Behavior (TPB) to study the relationship between attitude, social norms, and perceived behaviour control towards the intention of the nursery entrepreneur being an orchid entrepreneur. Lastly, data analysis is done by doing descriptive analysis and Pearson's correlation analysis.

Young Entrepreneurs' Participation In Tapioca Products

*A L Zul Ariff[1], A Mohammad Amizi[1], A Palsan Sannasi[1], and M Nursalwani[1]

[1]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia

Abstract. Tapioca production is very widespread in our country now. Malaysia is a relatively minor country in producing tapioca compared to Nigeria as the world's largest production of tapioca every year. Tapioca product seems to be a popular traditional food source for all communities in Malaysia so it can be expected that Malaysia will always have some domestic consumption. This is important because higher demand for processed tapioca products would improve the production, processing and selling of tapioca and raise revenues for farmers, processors and traders. From that, it can provide wide employment opportunities to new farmers and also young entrepreneurs can produce various products based on tapioca that can increase income and influence their job happiness to success in the field of entrepreneurship. This paper addresses three factors influencing young entrepreneurs' participation toward tapioca products which are attitude, subjective norm and perceived behavioural control.

Perception of Fish Farmers towards Halal Products on Animal Feed

*A L Zul Ariff[1], A Mohammad Amizi[1], H Zulhazman[2], E R Aweng[2], and M Nursalwani[1]

[1]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia.
[2]Faculty of Earth Science, Universiti Malaysia Kelantan, Locked bag No. 100, 17600 Jeli, Kelantan, Malaysia.

Abstract. The paper aims to discover the perception of halal products on animal feed among fish farmers. Animal feed has been one of the key aspects of the halal food supply chain. Muslims believe that feeding the animal with haram source of feed will contribute to the spoilage of the animal, that also tends to make the animal unacceptable for Muslim consumption. According to the Federal Agricultural and Marketing Authority (FAMA) and Universiti Sains Malaysia (USM) in 2010, reported that 40 percent of the country's feed producers are using of mixed animal-based materials in animal feed which is will gives rise to worries as to the halal integrity of animals feed. The issue of developed fish being fed with animal by-products (pig intestines) that was revealed in 2006 has irritated the Muslim population in the country. Besides that, under the JAKIM Halal Certification Procedure Manual, animal feed is classified as uncertified products. This study is looking forward to exploring the perception of halal products on animal feed among fish farmers. The issues of fish farmers started arising due to in proper feeding the aquaculture species with non-halal feed.

Identification of Competency Supervisor and Technician Heating Ventilating and Air Conditioning (HVAC) Maintenance in Oil and Gas Industry Malaysia

*M.M. Syafiq Syazwan[1], Fatimah Yusop[1], Mohd Suhaimi Saad[2], Kamarul Aini Mohd Sari[1], A.A.M. Damanhuri [3], Nik Normunira Mat Hassan[1] and A.R.Fahmi [1]

[1]Faculty of Engineering Technology, Universiti Tun Hussein Onn,84600 Pagoh, Muar, Johor, Malaysia
[2]Deparment Electrical and Electronic (Refrigeration and Air-Conditioning Technology), Advanced Technology Training Center, Bintulu, 97000 Bintulu, Sarawak, Malaysia
[3]Faculty of Mechanical and Manufacturing Engineering Technology, Universiti Teknikal Malaysia Melaka, Durian Tunggal, Melaka, 76100, Malaysia

Abstract. Heating Ventilation and Air Conditioning (HVAC) system is one of the critical systems which need to be maintained in oil and gas (O&G) industry Malaysia. HVAC system in O&G provide comfort for occupants and serve suitable ambient temperature for the critical rooms that are equipped with sensitive electrical equipment. The objective of this study is to identify the competency HVAC maintenance supervisor and technician in O&G industry Malaysia. The conceptual framework based on iceberg competency model have been used in this study to obtain technical, non-technical competency and core personality from the document. The result shows 17 competencies with 132 sub competencies for technical, 3 competencies with 38 sub competencies for non-technical and 4 competencies with 15 sub competencies for core personality. This identification of competency is an initial step to produce the competency framework for HVAC maintenance supervisor and technician O&G in the future.

Studies on Assessment of Biological Control Potential of Pathogenic Fungal Metabolites against *Parthenium hysterophorus* L.

*M A H Sheikh[1], M Shamsul[1], A L Zul Ariff[1], M K Uddin[2] and M R Uddin[3]

[1]Faculty of Agro-Based Industry, Universiti Malaysia Kelantan (UMK), Jeli Campus, 17600 Jeli, Kelantan, Malaysia
[2]Department of land Management, Faculty of Agriculture, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia
[3]Department of Agronomy, Bangladesh Agricultural University, Mymensingh, Bangladesh

Abstract. Ethyl acetate extracts of two fungi, *Aspergillus awamori (A. awamori)* and *Valsa mali (V. mali)* were screened for herbicidal activity against *Parthenium hysterophorus* L. The aim of the study was to investigate the herbicidal activity of fungal extracts obtained from *A. awamori* and *V. mali* on growth inhibition and seedling bioassay of *P. hysterophorus.* During a series of surveys, two pathogenic fungi were isolated from the weed of *P. hysterophorus* infected leaves following the typical isolation methods and identified. In the present study, the experiments were conducted with completely randomised designs (CRD) from September 2019 to January 2020 and was used the SMs as a weed control constituent. Fungal extracts were remarkably suppressed the weed growth and seedling bioassay of *P. hysterophorus* in vitro. The highest inhibitory activity both on growth inhibition and seedling bioassay was assessed by the extracts of *A. awamori* than *V. mali.* Our study concluded that the extracted fungal metabolites were performed an important inhibitory role on weed without any environment hazards. Hence, the fungal extracts of *A. awamori* and *V. mali* have a good potential as alternative strategies to manage *P. hysterophorus*.

Study on Mycoherbicidal Potential of Crude Extracts Obtained from Phytopathogen Against Endemic Weed

*M A H Sheikh[1], M Shamsul[1], A L Zul Ariff[1], M K Uddin[2] and M Arifullah[1]

[1]*Faculty of Agro-Based Industry, Universiti Malaysia Kelantan, Jeli Campus, 17600 Jeli, Kelantan, Malaysia.*
[2]*Department of land Management, Faculty of Agriculture, Universiti Putra Malaysia, 43400 UPM Serdang, Selangor, Malaysia*

Abstract. *Parthenium hysterophorus* L. *(P. hysterophorus)* is known as one of the most endemic weeds, causing severe environmental, economic loss and health hazards globally. The fungal extracts play an important role in controlling weeds that derived from pathogenic fungi are widely used as a mycoherbicide avoiding environment hazards. A pathogenic endophytes fungus was isolated and identified from the affected leaves of the host plant, *P. hysterophorus* following the standard isolation techniques by using potato dextrose agar (PDA) media. The pathogen was identified as *Aspergillus awamori* on the basis of morphological and molecular characteristics. The main objective of this study was to evaluate the herbicidal activity of fungal extracts obtained from *Aspergillus awamori* (*A. awamori*) on the detached leaf of *P. hysterophorus.* The bioassay result concluded that the fungal elicitor was extracted with Ethyl acetate and aqueous extracts of 14 days old fermented broth of *A. awamori* and was performed the efficient herbicidal activities against *P. hysterophorus.* The results of the present study indicated that fungal crude extracts greatly affected on detached leaf of *P. hysterophorus*. Therefore, fungal extract of *A. awamori* can be used in more sustainable alternative strategies against *P. hysterophorus* and ultimately diminish chemical herbicides applications.

Integration of Engineering Practices for Explicit Enhancement of Students' Learning Experience

*C-M Chan[1], K A Mohd Sari[1], A S Mohd Kassim[1], N Hashim[1]

[1]Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Pagoh Campus, 84600 Panchor, Muar, Johor, Malaysia.

Abstract. To ensure students of a 4-year engineering technology programme receive the best of learning in both theoretical and practical areas, conventional delivery channels were incorporated in the curriculum structure, e.g. lectures, labwork, tutorials and workshops. However this arguably 'traditional' approach is inadequate to cater for the fast-paced dynamism of the industry, where graduates often find themselves disconnected with current industrial settings and practices upon entering the workplace. This could be related to the rather rigid curriculum contents, organisation and delivery methods associated with the teaching and learning of technical programmes in general. In addition the curriculum review and revise processes are usually lengthy and onerous, making the positive changes inevitably outpaced by transformation of the industrial parctices. Therefore the integration of concurrent, in-trend elements of engineering practices in the existing curriculum and syllabus is necessary to enhance the students' learning experience. Recommended by the Engineering Technology Accreditation Council (ETAC), these exercises could be categorised as 'active' and 'passive' (Fig. 1), or simply denoted as 'classroom in industry' or 'industry in classroom' approaches. Whether bringing the students out to the relevant industry for site visit and interviews, or embedding real industrial problems in final year project (FYP), case studies, feasibility studies or investigation, this 'active' engagement would allow students first hand experience of their future workplace while learning the basic tenets in the respective courses. Similarly in a 'passive' manner, industrial participation in classrooms could be arranged via talks, studies, courses, consultations and evaluation of course-based projects, industrial logbook entries as well as employment of teaching staff with strong industrial background. Incorporation of these elements of engineering practices in the University's engineering technology programmes are organised and presented in this paper to illustrate the activites crafted with the industry to narrow the gap between textbooks and real world scenarios for in-house students. Notwithstanding the room aplenty for improvement, these engagements have had a profound impact on the students' learning, especially in bridging the theory-practical gap while providing exposure to current industrial practices and technology, hence better equpping them for the industry upon graduation.

Level of Young Entrepreneurs' Participation in Halal Food Products in Malacca

*M S Khairunnisa[1], A L Zul Ariff[1], and M Nursalwani[1]

[1]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia

Abstract. Young entrepreneurs are useful assets for the economic development of a country. In addition, young entrepreneurs are more accepting and open-minded compared to older entrepreneurs. Next, Halal means permitted or allowed from perspective of Islamic law that are safe to be consume by the consumers. The objective of this study was to identify the level participation of young entrepreneur in halal food products in Malacca. This research used purposive sampling techniques with survey method through questionnaire that has been distributed among young entrepreneur in Malacca by applying the Theory of Planned Behaviour (TPB). The sample size are 85 respondents of young entrepreneur and was conducted in Malacca area. The result shows high level participation of young entrepreneur in halal food products in Malacca.

Influencing Factors Of Young Entrepreneur's Participation In Halal Food Products In Sarawak

*M Nursalwani[1] and A L Zul Ariff[1]

[1]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia.

Abstract. Malaysia's role as a global leader for the Halal economy is one of the nations. At present, young entrepreneurs are increasingly active in the halal food sector because of Malaysia's reward initiatives, continued supports and numerous strategies or programs. Entrepreneurship is a smart choice for young adults to raise their wealth in comparison to the younger generation today. However, it is not easy for young entrepreneurs to engage in halal food labelling because they face various barriers stopping their involvement. This research was thus carried out to explore youth entrepreneurs' curiosity in Sarawak's markings for halal foodstuffs, as it is difficult for them to receive JAKIM's halal certificate. In addition, the young contractor faces a few problems as a Halal entrepreneur. The concern is that they lack expertise, skills, and funding to get their company underway. The survey was collected in a variety of districts in Sarawak and is 52 respondents (Bintulu, Kuching, Serian, Sibu). The goal of this study was to define the youth entrepreneur's level of involvement in halal food products. A questionnaire system for the gathering of data was used and the other method was interviewed – questions were answered in person, by email or by telephone. The outcome seems that young entrepreneurs engage strongly in the marking of halal food items in Sarawak. For the policymaker to make the process simpler for the young entrepreneur to apply a halal certification, the importance of this study is to be a guide since the complicated method prohibits the entrepreneur from being given a halal mark for their foodstuffs. Then this study will make the youth entrepreneur more conscious that even the process is difficult to get the halal mark because it will enhance economic development in the region.

LexisNexis Database: A Study on Usage and Satisfaction

*A Ismail[1], H B Affandy[1], M R Hamzah[1], and H Hussin[1]

[1]Faculty of Applied and Human Sciences, Universiti Malaysia Perlis, Pengkalan Jaya, Jalan Alor Setar – Kangar, 01000 Kangar, Perlis, Malaysia.

Abstract. Providing access to information especially in the forms of articles and journals has given students access to reliable information for references. In this study, the researchers identify the level of usage of LexisNexis among the students from the Faculty of Law, Universiti Teknologi Mara due to its appropriateness towards the Law field. Also, the study aims to identify the level of user satisfaction towards the usage of LexisNexis, based on the Technology Acceptance Model.

A Review On The Issues In Considering Building Maintenance Aspects At The Design Stage

*S Abdullah[1], E I Khalid[2], A A Razak[3], M H Hanafi[3]

[1]Faculty of Architecture and Ekistics, Universiti Malaysia Kelantan, 16300 Bachok, Kelantan, Malaysia
[2]Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia
[3]School of Housing Building and Planning, Universiti Sains Malaysia, 11800 Pulau Pinang, Malaysia

Abstract. The importance of a maintenance program for any building is well known and indebted. The performance of maintenance directly influences the building condition and function. Acknowledgment towards this situation supposes to be used in order to consider the maintenance aspect before the construction of any building. However, in the actual scenario, the consideration of the maintenance aspect only happened when a building is completely built and operate. This fact has led to the perception where the execution of building maintenance program is considered as a burden among the building owners. This paper has been established with the intention to discuss on what are the issues that have hindered the consideration of maintenance aspects at an earlier stage or specifically at the design stage. Based on the literature search, this paper has discussed these issues in three categories namely maintenance inputs, human capabilities, and supporting documents and facilities.

Influence of Regime Change on Malaysian Stock Market

*W F Lai[1], Z H Lim[1], B S Ang[1], S J Ho[1], A A Mamun[1]

[1]Faculty of Business and Management, UCSI University, No. 1 Jalan Menara Gading, Taman Connaught, 56000 Cheras, Kuala Lumpur, Malaysia.

Abstract. The twelfth, thirteenth, and fourteenth general elections (GE) in Malaysia have turned a new page in the political structure of Malaysia. In GE-12 and GE-13, the incumbent government, Barisan National, had failed to acquire the two-thirds majority in the parliament. The first regime changes in the history of Malaysia occurred during the general election in 2018. Amidst the political uncertainty, this study aims to examine the effects of the twelfth, thirteenth, and fourteenth general elections on the stock market of Malaysia by abnormal returns (AR). The outcome of this study reveals that the Kuala Lumpur Composite Index **(**KLCI) and other sectoral indices are significantly affected by GE-12 and GE-13 but not GE-14. Besides, the responses of the investors towards all the general elections are consistent with the theory of efficient market hypothesis (EMH), overreaction hypothesis (OH), and uncertain information hypothesis (UIH). Furthermore, the result of this study implies that the stock market in Malaysia had developed immunity towards electoral shock when the phenomenon of regime change becomes stronger.

Does Lean Manufacturing Practices Fit for Higher Education Implementation: Malaysian Polytechnics Perspective

*M Z Hasan[1], T. Amarul[2,3], N I Haris[1] and M N Ramli[4]

[1]Mechanical Engineering Department, Politeknik Tuanku Syed SIrajuddin, Pauh Putra, 02600 Arau, Perlis, Malaysia.
[2]Geopolymer and Green Technology, Centre of Excellence (CEGeoGTech), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia
[3]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP),Perlis, Malaysia.
[4]Mechanical Engineering Department, Politeknik Seberang Perai, 14000 Permatang Pauh, Pulau Pinang, Malaysia

Abstract. Competition in today's higher education marketplace is becoming violent all over the world. To find success, institutions of higher education are required to demonstrate the best quality and performance. Recognizing the effectiveness of lean implementation in the manufacturing industry, institutions of higher education are also not left behind. Malaysian Polytechnics are also in the process of introducing lean to further strengthen in the context of management and academic. Besides, organisations have used lean as a strategy to increase capacity, minimize and/or eliminate non-value activities, and add value to services and products for their customers, clients and students. Although lean manufacturing is a well-established concept, the application of lean principles to higher education institutions especially in Malaysian Polytechnics are relatively recent innovation in the literature. Therefore, this article aimed to review existing Lean in Institutions of higher education that might help scholars and practitioners gain better insights to implement Lean. This study proposed so that the institutions that deploy Lean enact and warrant improvements through the use of the PDCA cycle. When implemented as intended, this is a rigorous, scientific method of experimentation that enables an institutions to form hypotheses and test them to learn about how to move quickly and continuously toward its desired future state. Hence, based on previous studies, higher education institutions should implement Lean in the field of academic and management in their respective institutions. Specifically, in Polytechnics throughout Malaysia, it is very worthwhile to adapt and implement the concept of lean to increase quality and productivity in all facet.

Review on Graphene Application: Focus on Application as Additive in Internal Combustion Engine

*Sarbani Daud[1], Mohd Adnin Hamidi[1,3], Rizalman Mamat[2]

[1]Faculty of Mechanical and Automotive Engineering Technology, Universiti Malaysia Pahang, 26600 Pekan, Pahang, Malaysia.
[2]College of Engineering, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia.
[3]Automotive Engineering Centre, Universiti Malaysia Pahang, 26300 Gambang, Pahang, Malaysia.

Abstract. With new development in material sciences, many researchers have shown an increased interest in graphene. With the finding of the new production method, graphene has created breakthrough applications in composite materials, biomedical, water filtration, and energy sector. It also has been applied in many energy applications and proven to be successful. The purpose of this article is to review the application of graphene in the energy sector. The properties of graphene are then compared with other nanomaterials such as graphene oxide and carbon nanotubes. The application of the material is then examined more specifically in the internal combustion engine application. Numerous studies experimented the graphene application in diesel engines. However, there are limited experiments of graphene application in spark-ignition engines. Hence, we need to explore more the graphene applications in the energy sector for example by adding it into gasoline to improve the performance of the spark-ignition engine.

COVID-19 Pandemic:Does Polytechnic Internship Performance Affected?

*M Z Hasan[1], T. Amarul[2,3], N F Alui[1] and N H Jurimi[1]

[1]Industrial Relations & Training Unit, Politeknik Tuanku Syed Sirajuddin, Pauh Putra, 02600 Arau, Perlis, Malaysia.
[2]Geopolymer and Green Technology, Centre of Excellence (CEGeoGTech), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia
[3]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP),Perlis, Malaysia.

Abstract. The coronavirus (COVID-19) which is a global pandemic has disrupted the educational sector, forcing campuses to shut down and schools to move to an online teaching method for education. The COVID-19 has posed significant challenges to the tertiary education sector. Subsequently, in the context of tertiary education, most of the students need to undergo for industrial training or internship. Therefore, the aim of this study is to investigate either COVID-19 affected the Polytechnic internship performance. This study has been conducted at Politeknik Tuanku Syed Sirajuddin, Perlis, Malaysia using empirical data. There are six departments involved in this study namely Electrical Engineering Department; Mechanical Engineering Department; Commerce Department; Hospitality and Tourism Department; Design and Visual Communication Department; and Information and Computer Technology Department. The comparison of internship results between three semesters which is before COVID-19 pandemic and also during COVID-19 pandemic has been presented in this paper. The result revealed that the COVID-19 pandemic did not affect the performance of the internship because of the education given to students in the institution to be responsible for performing the tasks provided by using information and skills. Further studies pertaining to internships and the COVID-19 pandemic still need to be explored for future research. The researcher suggested that the effects of the COVID-19 pandemic be investigated in the context of a challenge for internship placement.

Indoor Air Quality Performance in Malaysia School: Review on Ventilation System and Carbon Dioxide

*N R Md Daud[1], K A Mohd Sari[1], A Z Abdul Wahid[1], N A Mohd Arish[1]

[1]Department of Civil Engineering Technology, Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Campus Pagoh Branch, 84600, Muar, Johor, Malaysia

Abstract. Surveys on Malaysia school environments emphasize that indoor air quality (IAQ) is often inadequate. Poor ventilation and high concentration of carbon dioxide (CO_2) in classroom cause risk of sick building syndrome (SBS) and respiratory problems to the students. There are three causes of IAQ problems: insufficient external ventilation, indoor environment and indoor air pollution. Therefore, the objective of this study are to identify previous studies related to IAQ performance in Malaysia school, analyze the environment parameter, ventilation system and CO_2, and lastly to compare with American Society of Heating, Refrigerating and Air-conditioning Engineers (ASHRAE-62.1, 2016) and Industry Code of Practice (ICOP, 2010). The ventilation system used in this case study method was natural, mechanical and hybrid system. There are 10 journals were reviewes with 19 schools involved on IAQ performance. The result found that Sekolah Rendah Integrasi Pintar Bukit Jelutong (S1) and Sekolah Sri Pintar Seksyen 7 (S2) have high concentration of CO_2 with 1684 ppm and 2070 ppm, respectively. The main factor that influencing higher CO_2 concentration in S1 and S2 was due to mechanical ventilation (split unit air-conditioning system) that only recirculate supply air and less than 10% of fresh air provision from outside into the classroom. Therefore, continuous exposure to CO_2 at high concentration (>1000 ppm) exposed students to SBS symptoms such as headache, less concentration, and fatigue. As a conclusion there is a strong IAQ correlation between ventilation system and CO_2 concentration in the classroom. Improvements on air-conditioning system are most recommended.

Review on Sustainable Thermal Insulation Panel Based on Natural Materials

*N K Wen[1], K A Mohd Sari[1], M A Rosli[1], R Muslim[1], H Kosnin[1]

[1]Faculty of Engineering Technology, Universiti Tun Hussein Onn Malaysia, Campus (Pagoh Branch), 84600 Panchor, Muar, Johor, Malaysia

Abstract. Nowadays, thermal insulation material becomes relevant in terms of environmental comfort due to climatic problems. Several issues in buildings today are related to heat gain and thermal control. Human comfort is based on heat exchange between humans and environment around them. Temperature in buildings goes higher could affect the ability and work of occupants and the climatic condition directly influences the indoor environment. This study is focused on insulation materials to reduce the heat gain of buildings. The objectives for this study are to identify previous research on thermal insulation using natural materials, to analyze the thermal conductivity properties of panel and to compare the natural materials with standard thermal conductivity of insulator. Ten types of natural material for thermal panels and data are collected from ten previous study. The results on density and thermal conductivity for pineapple fiber are 12.72 kg/m^3 and 0.0300 W/mK. Results for basalt fiber are 145 kg/m^3 and 0.0320 W/mK whereas hemp fiber are 36.02 kg/m^3 and 0.0339 W/mK. Therefore, ten natural materials are considered as insulator due to their thermal conductivity are lesser than 0.25 W/mK. Three recommended materials, pineapple fiber, basalt fiber and hemp fiber are the best thermal insulators among the natural materials.

Ergonomic Power Lifter: A case Study of RULA and REBA Analysis

*Y Masniza[1], T Amarul[2,3], M S Aisyah[1], M R M K Sadiq[1], R S Syawal[1] and J Azriena[1]

[1]Mechanical Engineering Department, Politeknik Tuanku Syed Sirajuddin, 02600 Arau, Perlis, Malaysia.
[2]Geopolymer and Green Technology, Centre of Excellence (CEGeoGTech), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia
[3]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP),Perlis, Malaysia.

Abstract. This study is focusing in the use of RULA and REBA analysis before and after. The current working posture of employees have been investigated in order to create the new tool. The new tool is designed with ergonomic features that can reduce employee's exposure to musculoskeletal disorder, (MSD). It also aims to solve the problem of gas barrel lifting. In addition, it aims to identify and determine the ideal work posture while working to reduce the risk of severe posture. In this study some suitable quality tools along with Lean Six Sigma improvement process DMAIC (Define, Measure, Analyse, Improve, Control) approaches are applied. Conclusion of this study is the RULA analysis result on the work posture of current gas barrel lifting gave a score of 7. This score shows a high-risk level and needs work posture improvement immediately. Meanwhile, the score of RULA analysis on the work posture using Ergonomic Power Lifter is 3, which means that there is a decrease from a high risk at a low-risk level. It also concludes for the REBA score which is 11 for current tool that indicates high risk and calls for further investigation and work method changes to reduce or eliminate level of MSD risk for long term effect. Then, the REBA score after using the new tool is 4 which is decrease to low-risk-level.

A Review on Waste Cooking Oil (WCO) as Binder Modifier in Porous Asphalt Pavement

*F S Kharuddin[1], W N A W Azahar[1], N Kasim[1], A B Ramli[1], N K Basri[1], N S Engliman[2] and R P Jaya[3]

[1]Civil Engineering Department, Kulliyyah of Engineering, International Islamic University Malaysia, Jalan Gombak, 53100 Selangor, Malaysia.
[2]Biotechnology Engineering Department, Kulliyyah of Engineering, International Islamic University Malaysia, Jalan Gombak, 53100 Selangor, Malaysia.
[3]Department of Civil Engineering, College of Engineering, Universiti Malaysia Pahang, Lebuhraya Tun Razak, 26300 Kuantan, Pahang, Malaysia.

Abstract. The porous asphalt pavement is designed with open graded mixture desires in reducing the water on pavement surface by infiltration, reducing the noise, splash and spray aid to promote the safety of the road users. However**,** the open structure of porous asphalt pavement has accelerates the aging process to occur faster than conventional pavement due to the easy access of oxygen. Aging process is undesirable since the pavement will become harden and brittle hence reducing the durability and pavement service life. Thus, the potential of Waste Cooking Oil (WCO) as an asphalt modifier is regard as an alternative to cater the issue of brittle pavement since it contains natural antioxidants, which can retard the oxidation process. The previous research shown the performance of WCO in rejuvenated bitumen has higher penetration value than original bitumen. Thus, this paper aims to review the capability of WCO as binder modifier in addressing the issue that regards to aging in porous asphalt pavement.

Local Custom Compliance Strategies: Halal Tourism Competitive Advantage

*M R Nurshadira [1] , M Dzulkifli [1] , M Mohd Zulkifli [1]

[1]Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, 16100 Kota Bharu, Kelantan, Malaysia.

Abstract. Scholars foresee the relevance of local custom compliance with the environment as a source of competitive advantage for hotels. The relationship between the environmental proactivity of hotels located in the provinces of local custom compliant and their economic performance levels has been studied. The paper analyses the current issues and challenges of business survival and presently halal tourism. The movement business sees the generation of energy for the halal movement businesses both from the point of view of industry and policy makers. The Halal movement business can be summed up by actions that are sensible to use or participate in the movement business as demonstrated by Islamic exercises. In this way, the achievement and advancement of halal's business movement objective must be guided by the establishment of Islamic exercises and guidelines in all parts of the business operations. This paper suggests that the possibility of hoteliers to utilize their business components to fit into requirement of local custom compliance. In addition, the odds and difficulties of making and advancing halal business operation has been impetus to their survivability are discussed.

Attitudes, Legal Rights, Cyber Security and Knowledge: A Study on The Awareness of Social Media Cybercrimes Among Young Generation in Public Universities in Kelantan

*W. F. Wan Zulkiffli, [1], S. A. Zainuddin, [1], N. Mohd Said[1], N.I. Mohammad Anuar[1], R.H. Redzuan[1] and L.M. Hong[1]

[1]Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, 16100 Kota Bharu, Kelantan, Malaysia

Abstract. Social networking sites have become the most popular platforms for online interaction, communication, and content dissemination among today's Internet users. Indeed, social media sites such as Facebook, Instagram, and Twitter are some of the most popular platforms among users of social media today. Nevertheless, the rise of social media usage has caused users to perceive a greater possibility of growing cybercrime risks. Therefore, this study aims to identify the relationship between attitudes, legal rights, cyber security, and knowledge towards the awareness of social media cybercrimes among the young generation, since youths are more likely to engage on social media compared to other age groups. Four hypotheses were developed to test the relationship between the dependent variable and the independent variables. In this study, a simple random sampling method was used in data collection through the use of questionnaires. The questionnaires were distributed in several public universities in the state of Kelantan. A total of 380 respondents had taken part in this study. Descriptive analysis was performed using SPSS software, while measurement model analysis and path coefficient were implemented using SmartPLS 3.0. As a result, it is observed that all of the independent variables have a significant relationship towards the youth's awareness. This study is expected to contribute significantly in academic and practical fields towards creating an awareness of social media cybercrimes among social media users and relevant organizations.

Food's Expert Perception Towards Local Food Innovation in Malaysia

*N A I A Tukiran[1], S H Zakariah[1], N A Ahmad[1], L M S Ismail[1] and M Aisisa[1]

[1]Faculty of Technical and Vocational Education, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Batu Pahat, Johor Malaysia.

Abstract. Local food is known as food specialties to an area with the taste of the community's specialty. However, the food industry in Malaysia has grown exponentially with the growth of the world food industry. In fact, the power of the food transmission has been widespread among the people through social media and various sources. These food innovation factors are from the development of the food system, social and political will, and consumer needs and desires. A variety of locally sourced foods are now available such as fast food paste, frozen food products, travel packs and more. Therefore, this study was conducted to explore the perceptions of local food innovation. Data was collected using interviews and documentation. Data analysis was carried out using thematic methods. The findings of this study shows that there were views and perceptions showed that if too much modification of local food been done, the food authenticity will have threated, the use of ingredients in the production of innovative foods may gave impact on the communities' health and finally, this study is intended to provide consumers and entrepreneurs with guidance to increase on the quality local food innovations in the food industry.

Measuring satisfaction in the environment of the University of Babylon from the perspective of students, academics, and employees

*Huda S Alhasan[1], Ibtisam A Aljazaery[2] and Halla A Chabuk[3]

[1]Environmental Research and Studies Centre, University of Babylon, Hillah, Iraq
[2] College of Engineering, Babylon University, Hillah, Iraq
[3]College of Science, University of Babylon, Hillah, Iraq

Abstract Educational organizations worldwide are requesting input from both students and staff regarding university facilities, services, environmental awareness, laboratories, recreational buildings, and administrators. Iraqi universities have recently started seeking their employees and students' opinions about their educational facilities and instructional practices. In order to understand the absence of strategic objectives and possible solutions to them, the view is generally implemented through questionnaires. In this study, Google Forms were presented online on the University of Babylon website/ Iraq; and it is concerned with universities, the function of administrators and a healthy environment, as well as questions about Laboratory safety and security. The study was conducted from January to May 2019. A total of 116 questions were distributed to 48, 33 and 35 academics, technical staff and students, respectively. The data obtained online analyzed using SPSS software, and it was found that most of the academics, workers and students were concerned with safety rules in the laboratory and their sensitivity around an ideal healthy campus.

Effect of COVID-19 on the Embedded Industrial Seminar Implementation Based on TVET Undergraduate Students Perception

*M R Yaacob[1], W H Mohd Saad[2], M N Maslan[3], Z Abal Abas[4] and W M Bukhari [1]

[1] Faculty of Electrical Engineering, Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia.
[2] Faculty of Electronic and Computer Engineering, Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia.
[3] Faculty of Manufacturing Engineering, Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia.
[4] Faculty of Information and Communication Technology, Universiti Teknikal Malaysia Melaka, Hang Tuah Jaya, 76100 Durian Tunggal, Melaka, Malaysia.

Abstract. COVID-19 has massively hit the whole world in many different aspects of life including the delivery of embedded industrial seminar (EIS), which is one of the significantly important academic activities in Technical and Vocational Education and Training (TVET) higher institutions. EIS, which was previously conducted on a face-to-face (F2F) basis has been urged to undergo a transition to the online alternative. It is therefore a great interest in conducting a preliminary study to evaluate the effect of COVID-19 on this transition, based on the undergraduate students' perception. The survey was conducted on 129 respondents who have participated in an online EIS organized by the Faculty of Electrical Engineering, Universiti Teknikal Malaysia Melaka (UTeM), through a set of questionairres on an online form. Besides revealing a high degree of agreement on the direct impact of COVID-19 on the EIS implementation, the results also possess significant potential for the online EIS to equally replace the F2F implementation in the future.

Challenges in Coordinating and Conducting an Integrated Group Project in Mechanical Engineering during COVID-19 Pandemic Phase: A Case Study

*N K Khamis[1], Z Wahid[1] and I F Mohamed[1]

[1]Department of Mechanical and Manufacturing Engineering, Faculty of Engineering and Built Environment, Universiti Kebangsaan Malaysia, 43600 Bandar Baru Bangi, Selangor, Malaysia

Abstract. COVID-19 has affected the lifestyles of entire populations around the world. In the academic sector, the government-mandated instruction has changed the pattern of the teaching and learning landscape. Learning styles have changed completely from face to face to the use of virtual mediums. This situation does greatly affect the level of readiness not only to the lecturers but also the students. Assignments involving individual work may be less challenging compared to assignments involving group projects. Therefore, this study was conducted to understand the difficulties and challenges faced by lecturers and students in the implementation of group projects in this pandemic phase. Informal interviews and data collection via survey have been performed to understand the impact of this new norm towards group project particularly in Mechanical Engineering field. Findings showed that online group project in this pandemic phase is complicated as lack of communication effectiveness. In addition, due to lack of physical presence, some important aspects particularly related to technical issues are difficult to be solved. In conclusion, the balance between the goals set in the project as well as the challenges faced by students and lecturers need to be considered to ensure the smooth implementation of group projects. Empathy is one of the necessary elements that been taken in this study. The setting of communication guidelines between group members and supervisors is recommended for online group project if this similar situation happen again in the future.

Determinants of Stock Market Investment Intention and Behaviour among Malaysian Adults

*N. C. Sam[1], K. Y. Yi[1], Z. Noor Raihani[2] and A. A. Mamun[1]

[1]Faculty of Business and Management, UCSI University, 56000 Kuala Lumpur, Malaysia.
[2]Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, 16100, Kota Bharu, Kelantan, Malaysia.

Abstract. This study assessed the effects of Attitude (AT), Subjective Norm (SN), Perceived Behavioural Control (PC), and Past Investment Behaviour (PB) on investment intention and behaviour among Malaysian working adults. This quantitative study had adopted the cross-sectional design and data were collected from 320 working adults in Malaysia via online survey. This study revealed that AT and PC displayed a significantly positive effect on investment intention (II). Meanwhile, SN and PB exerted insignificantly positive impact on II. It was found that intention to invest in stock market mediated the correlations among PB, AT, SN, and PC. Hence, in order to promote the participation of investment in stock market among working adults, the significance of SN cannot be undermined. Notably, SN emerged as a strategic theme for the government and policymakers in educating investors through their opinion leaders to increase participation rate.

MAIM's Practices for *Zakat* Communication Strategy via New Media

*M.S. Muhammad Taufik[1], M.O. Mohd Hanif[2], S S.Salahudin[1], M Juritah[3]

[1]Academy of Contemporary Islamic Studies, UiTM Cawangan Melaka, Kampus Alor Gajah 78000 Alor Gajah, Melaka, Malaysia
[2]Faculty of Art & Design UiTM Cawangan Melaka, Kampus Alor Gajah 78000 Alor Gajah, Melaka, Malaysia
[3]Academy of Language Studies UiTM Cawangan Melaka, Kampus Alor Gajah 78000 Alor Gajah, Melaka, Malaysia

Abstract. The Enactment of Islamic Religious Administration (State of Malacca) 2002 clearly stated that the Melaka Islamic Religious Council (MAIM) is responsible for organizing, planning and managing welfare matters of zakat beneficiaries for all *asnaf* groups. In fact, accumulated *zakat* would be distributed to specific groups (*asnaf*) for economic driven purposes, not just for short term, but also for long term economic purposes which is to enable these *asnaf* groups to break free from poverty domains. To date, communication promotion strategies regarding *zakat* collection and distribution in Melaka has been fruitful due to the increasing rate of *zakat* collection per year. Nonetheless, the question is how effective is the new media strategy done by MAIM in communicating and promoting information about *zakat* collection and activities within the Melaka areas? In fact, new media could have positive impacts such as promoting physical activities of *zakat* distribution to *asnaf*. Thus, this paper discusses how the *zakat* communication strategies conducted by MAIM through new media serve as a communication source in highlighting *zakat* management and distribution activities done by Zakat Melaka and MAIM. This study applies descriptive methods using qualitative approaches. Significantly, the data gleaned and the results of the study done would contribute towards providing clear cut information which could guide towards the improvement of *zakat* collection, distribution and administration for MAIM in future.

Pandemic Covid-19: Topics of Discussion Within the Context of Property Management Service in Malaysia

*S Abdullah[1], S Ismail[1], K A Mat Daud[2], R Ab Rahman[1]

[1]Faculty of Architecture and Ekistics, Universiti Malaysia Kelantan, 16300 Bachok, Kelantan
[2]Faculty of Creative Technology and Heritage, Universiti Malaysia Kelantan, 16300 Bachok, Kelantan

Abstract. The implementation of MCO, which aims to break the spread of pandemic COVID-19 in Malaysia, has caused various service or employment areas to be temporarily suspended. The operation of property management service on numerous types of property in this country is no exception despite the awareness this practice is necessary to be implemented to ensure a property can function well. This situation has created a call for property management service to be listed as one of the essential services that need to be listed during the MCO period. The operation of property management service has faced various challenges during the pandemic situation. This article is produced to review the main topics discussed related to the property management service in the country's period is facing the COVID-19 pandemic. The review is based on the articles published in newspapers, websites or expert blogs. This review finally found that the discussions revolve around 4 main topics: property management as an essential service, the issues in conducting property management service during pandemic time, property management guideline during pandemic time, and technology application.

Contribution of Traditional Medicinal and Aromatic Plants Species on Elderly Health Care

*R Hasan[1], WSNW Mohamad[1], K Hassan[1], MRM Nasir[1] and N Ramlee[1]

[1]Faculty of Architecture and Ekistics, Universiti Malaysia Kelantan, Campus Bachok, 16300 Bachok, Kelantan, Malaysia

Abstract. Medicinal and aromatic plants are the essential lifeline for the survival of human life on earth for centuries. Aromatherapy is the art and science of utilizing naturally extracted aromatic essences from plants to balance and harmonise the human body. There are three different types of aromatherapy used clinical, holistic and aesthetic. Clinical aromatherapy helps relieve stress and anxiety. Holistic aromatherapy improves the overall wellbeing, focuses on the whole person and enhances the quality of life. Thus, this research aims to educate the elderly regarding the importance of medicinal and aromatic plants against health care. A Mix method approach has been used in this study. 200 set of questionnaires was distributed to the elderly respondents while 100 respondents agreed to be interviewed. The results indicate that knowledge level score related to medicinal and aromatic plants and 24 aromatic and medicinal plant species that have been used by the elderly such as *Eurycoma longifolia* (Tongkat Ali), *Labisia pumila* (Kacip Fatimah) and *Centella asiatica* (Pegaga).

A Study on Youth Awareness towards Cultural and Heritage in Kelantan State

*R Hasan[1], WSNW Mohamad[1], K Hassan[1], MAMJ Noordin[1] and N Ramlee[1]

[1]Faculty of Architecture and Ekistics Universiti Malaysia Kelantan 16300 Bachok, Kelantan, Malaysia.

Abstract. The purpose of this study is to analyse the level of cultural heritage awareness among Malaysian youths. To achieve the aim of study, two objectives have been formulated (i) to study the culture and heritage of Kelantan (ii) to examine the level of youth awareness related to cultural and heritage in Kelantan state. Malaysia is a multicultural country that has many cultural and heritage values. However, there are some people unknowledgeable about cultural and heritage. Also, some do not care about the uniqueness of cultural and local identity in Malaysia. Rapid development has disturbed the nature of the environment, heritage buildings and quality of human life. Youths need to play an essential role in maintaining and promoting their cultural and heritage for future generations. Thus, these studies explore the cultural and heritage in Kelantan and the level of youth awareness. Face-to-face interviews and online surveys were conducted in this study. The result indicates 8 elements' that contribute to heritage in Kelantan, and more than half of the respondents are fully aware of the heritage.

Key Performance Indicators for Service Performance in Supply Chain Management of Telecommunication Industry Specifically in High Speed Broadband (HSBB) Service Installation: A Case Study

*N. A. Ahsain[1], N. Saibani[1] , M. N. A. Rahman[1] and H. Hishamuddin[1]

[1]Department of Mechanical & Manufacturing Engineering, Faculty of Engineering & Built Environment Universiti Kebangsaan Malaysia (National University of Malaysia), 43600 Bangi

Abstract. Increase in the competitive environment in telecommunication industry, customer demand for cheaper product with better quality service requires the telecommunication companies to efficiency and efficiently operate their supply chain management in order to perform better performance than their competitors. The supply chain management practice has mostly been analyzed as a strategy that can help to gain competitive advantage in business performance. Therefore, the purpose of this paper is to study the supply and demand chain flow in the telecommunication industry specifically in high speed broadband, to identify the problems in supply chain that lead to poor performance in high speed broadband and to identify key performance index to obtain high quality high speed broadband in telecommunication industry. The scope of the study is focusing on the installation stage of the high speed broadband which has highest interaction with the customers. It involves not only relationship between the organization (the service provider) and the customer, but also the partner of the organization (i.e. the installers) who is directly communicates with the customer. A case study on one of the telecommunication company in Malaysia, named as Company A, shows that there are few partners involve in their supply and demand chain flow which includes the company itself, the suppliers, the installers as well as the customers. A few hypotheses were tested based on the survey results in order to identify at which stage of the relationship or integration amongst the partners that cause more on the customers' satisfaction. Based on the analysis, it is found that there are direct relationship between customer satisfaction and service performance in the high speed broadband installation activity. Amongst others, the most important factors that could contribute to the customers' satisfaction are compliance to operational, safety and health (OSH) and safety requirements, prompt service delivery to customer, courteousness and friendliness as well as dependability of the installers. Three proposed key performance indicators were identified for managerial implications which are response time, installers' efficiency as well as installation effectiveness. At the end of the report, there are also suggestions for future improvements to be considered for future research.

ICT Adoption among Rural SME in Sarawak

*Siti Nur Khairunnisa Ahmad[1] ; and P.Yukthamarani Permarupan[1]

[1]Faculty of Entrepreneurship and Business, Universiti Malaysia Kelantan, 16100 Kota Bharu, Kelantan, Malaysia

Abstract. Small and Medium-sized Enterprises (SMEs) contribute significantly to national revenue in Malaysia. This is because the government of Malaysia has appointed separate organizations to enhance the SME industry in the current commercial core. It's included rural SME especially in Sarawak to be standing along with other SMEs. SME owner's personalities which is owner's attitude, innovativeness and knowledge involved closely with ICT adoption nowadays. Therefore, this study aims to identify the SME owners' personality's relationship with ICT adoption. There were three independent variables have been chose for this study which is: owner's attitude, innovativeness and knowledge. This research was carried out using quantitative methodology and was chosen for data collection by 303 respondents from rural SME in Sarawak. SPSS software has evaluated all the responses. The results of the data shows that the three independent variables in this research are linked to ICT adoption among rural SME in Sarawak. This research is essential for SME itself mainly in Sarawak which is personality of the owner of SME has more influence on the ICT adoption among rural SME in Sarawak.

Communication Strategies and Models Based on Local Cultural Wisdom to Accelerate the Reduction of Stunting Cases in Cirebon Regency: Preliminary Concept

*Titin Nurhayati Ma'mun[1], Ikhwan[1], Taufik Ampera[1], and Hazmirullah[1]

[1]Department of Philology and History, Faculty of Cultural Sciences, Universitas Padjadjaran
Jalan Ir. Soekarno Km. 21 Jatinangor, Kabupaten Sumedang, Jawa Barat

ABSTRACT: This research is entitled "Communication Strategies and Models Based on Local Cultural Wisdom to Accelerate the Reduction of Stunting Cases in Cirebon Regency: An Initial Idea". This research was conducted using case studies of 3 villages in Cirebon Regency, one of the areas in West Java which still has a high prevalence of stunting. The main objective of this research is to create effective communication strategies and models in efforts to reduce stunting rates in Cirebon Regency. This research was conducted using both quantitative and qualitative methods, with two data collection methods, namely the main method (including questionnaire distribution, observation, interviews, participation, and document review) and complementary methods (including narration as well as films, videos and photos). The results show that there are at least three causes for the high number of stunting cases in Cirebon Regency, namely (1) the high rate of early marriage, especially among females, (2) the low understanding of stunting, and (3) the common belief in superstitions (in the form of recommendations or taboos) which have the potential to hinder the child's development. For this reason, communication strategies and models are needed to accelerate the reduction of stunting cases in Cirebon Regency.

Innovation: The Impact of IR4.0 on Industrial Training Management

*M Z Hasan[1], T. Amarul[2,3], N H Jurimi[1] and N F Alui[1]

[1]Industrial Relations & Training Unit, Politeknik Tuanku Syed Sirajuddin, Pauh Putra, 02600 Arau, Perlis, Malaysia.
[2]Geopolymer and Green Technology, Centre of Excellence (CEGeoGTech), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia
[3]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP),Perlis, Malaysia.

Abstract. The coronavirus (COVID-19) which is a global pandemic has disrupted the educational sector, forcing campuses to shut down and schools to move to an online teaching method for education. The COVID-19 has posed significant challenges to the tertiary education sector. Subsequently, in the context of tertiary education, most of the students need to undergo for industrial training or internship. Therefore, the aim of this study is to investigate either COVID-19 affected the Polytechnic internship performance. This study has been conducted at Politeknik Tuanku Syed Sirajuddin, Perlis, Malaysia using empirical data. There are six departments involved in this study namely Electrical Engineering Department; Mechanical Engineering Department; Commerce Department; Hospitality and Tourism Department; Design and Visual Communication Department; and Information and Computer Technology Department. The comparison of internship results between three semesters which is before COVID-19 pandemic and also during COVID-19 pandemic has been presented in this paper. The result revealed that the COVID-19 pandemic did not affect the performance of the internship because of the education given to students in the institution to be responsible for performing the tasks provided by using information and skills. Further studies pertaining to internships and the COVID-19 pandemic still need to be explored for future research. The researcher suggested that the effects of the COVID-19 pandemic be investigated in the context of a challenge for internship placement.

A Survey On Consumer Purchasing Behaviour Towards Clay-Based Cosmetics

*N N A Zakaria[1], I Z Pishal[1], Z A Abdul Latiff[1], and M A Ayob[1]

[1]Faculty of Agro Based Industry, Universiti Malaysia Kelantan, Locked Bag No. 100, 17600 Jeli, Kelantan, Malaysia.

Abstract. Clay is an amazing skin care ingredient that has been used by ancient civilizations for centuries. Today, it is being utilized in cosmetic industry to cleanse or reduce the amount of oil in the skin. All skin type can benefit from using clay-based cosmetics whether oily, normal, dry or combination skin. The cosmetic industry is one of the sectors with large consumers because people are willing to spend more money for healthy and radiant skin. Although clay-based cosmetics are less popular among consumers but the benefits of clay to the skin and the presence of innovative clay-based cosmetics in the market increases purchasing behavior among consumers. Consumer buying behavior refers to the study of customers including how consumer behave while deciding to buy a product that satisfies their needs. Consumer buying behaviour is very important in the cosmetic industry because the buying and usage of a product depends greatly on consumers' action while deciding to buy and their expectation of the product. This survey is proposed to identify general profile of clay-based cosmetics consumers and the factors influencing purchase. This survey was a cross-sectional study involving 300 students in Universiti Malaysia Kelantan, who were randomly selected and reached out through social applications to answer the survey questions. Obtained data was analyzed using SPSS and presented as descriptive analysis of frequency, percentage of total respondents. Factor analysis was used to determine main factor that influence buying behavior. The results show that the most influencing factor was for consumers' subjective norm followed by perceived behavioural control and attitude toward clay-based cosmetics. The significant relationship of gender and monthly income as demographic factor obtained can be related to the attitude and perceived behavioural control of consumers purchasing behavior towards clay-based cosmetics.

Case Study: The *Kaizen* of Multipurpose Rack Based on Lean Manufacturing Concept

*M Z Hasan[1], T. Amarul[2,3], N E Darusomin[1],N A Yusri[1], N Q Shamsul Azman[1], and M I Abdul Latif[1]

[1]Mechanical Engineering Department, Politeknik Tuanku Syed SIrajuddin, Pauh Putra, 02600 Arau, Perlis, Malaysia.
[2]Geopolymer and Green Technology, Centre of Excellence (CEGeoGTech), Universiti Malaysia Perlis (UniMAP), Perlis, Malaysia
[3]Faculty of Mechanical Engineering Technology, Universiti Malaysia Perlis (UniMAP),Perlis, Malaysia.

Abstract. Lean Manufacturing Concept is considered as a manufacturing philosophy that can lead to global manufacturing performance by adopting and carefully implemented in the organisations. As per the growing interest, federal government through Malaysia Productivity Corporation (MPC) also have set interest and demonstrated commitment on Lean Manufacturing Concept. MPC's lean journey was initiated as part of improving the operations of the small and medium enterprises (SMEs) in Malaysia. In line with that, this study was aimed to execute a case study in SME sewing industry in Perlis. Specifically, this study aimed to implement *Kaizen* in fabricating multipurpose rack for cloth at small medium enterprise (SME) industry. Also, aimed to reduce difficulties and time taken in finding ready-made baju kurung for packaging process and provide proper placement for raw material. Besides, this study also aimed to minimize the use of space in the premise. Pugh method has been used to select the best rack design. Before the project has been developed, lean manufacturing concept has been studied. Consequently, lean manufacturing tools such as *Kaizen* and standard work using time taken has been applied. The project is designed using inventor software. Overall, the *Kaizen* of Multipurpose Rack based on Lean Manufacturing Concept has helped achieve the objectives of this study as able to eliminate difficulties and reduce time taken in finding ready-made baju kurung for packaging process and also provided proper placement for raw material. Moreover, it is also able to minimize the use of space in the premise by using multipurpose rack that developed based on lean concept.

The Factors That Can Lead to Stress During Covid-19 Among Malaysians

*A R Ridzuan[1], N F Saidin[1],A Zulkarnain [2], and A Luthfia [2]

[1]UniversitiTeknologi MARA (UiTM) Cawangan Melaka, Km 26, Jalan Lendu Batu, 78000 Alor Gajah, Melaka, Malaysia
[2]BINUS University, Jakarta Indonesia

Abstract: Coronavirus disease (COVID-19) is an infectious disease caused by a newfound virus. The vast majority contaminated with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Since the cases become more serious, Malaysian's government announced a Movement Control Order to beat coronavirus and protect health systems. However, there are unintended, negative consequences. As the virus continues to spread across the world, it brings multiple new stresses including physical and psychological health risks. The purpose of this study is to examine the level of stress and the factors that can lead to stress during COVID-19 among Malaysians. Researchers have used quantitative survey and the survey has been distributed to all social medias' platform from various people. In sampling, researchers have referred to Raosoft Sample Size Calculator. The total number of respondents is 191. The findings of this research prove that Malaysians are having stress during this pandemic M=3.58 which is higher. Furthermore, the result shows that female is having more stress with significant difference (0.01) during COVID-19 pandemic compared to male.

The Relationship Between Effectiveness Factors and Online Learning Acceptance During COVID-19

*A R Ridzuan[1], I S Ibrahim Sukri[1], A Zulkarnain [2], and A Luthfia [2]

[1]UniversitiTeknologi MARA (UiTM) Cawangan Melaka, Km 26, Jalan Lendu Batu, 78000 Alor Gajah, Melaka, Malaysia
[2]BINUS University, Jakarta Indonesia

Abstract. Online Learning encompasses a range of technologies such as the worldwide web, email, chat, new groups and texts, audio and video conferencing delivered over computer networks to impart education. It helps the learner to learn at their own pace, according to their own convenience. The deteriorating condition of the Covid-19 has led to the closing of universities across the globe, impacting millions of students. The main objective of this study is to identify the effectiveness of online learning among university students during COVID-19 crisis. Literatures have identified several key reasons to contributing online learning acceptance. These key points were effectiveness of online tools, media involvement, interaction and student's satisfaction. All the key points were deemed important to the effectiveness of online learning during the COVID-19 crisis. Researcher have used quantitative survey and the surver has been distributed to all social medias' platform to various people. In sampling, researchers referred to Raosoft Sample Size Calculator (2004). The total number of respondents is 193. The finding of this research indicate online learning acceptance is high, M=2.70.

The Role of Social Media in Promoting Effectiveness Campaign During COVID-19

*A R. Ridzuan[1], H. Jeffuzan Geo[1] ,A. Zulkarnain [2], and A. Luthfia [2]

[1]UniversitiTeknologi MARA (UiTM) Cawangan Melaka, Km 26, 78000 Alor Gajah, Melaka, Malaysia
[2]BINUS University, Jakarta Indonesia

Abstract: Today, social media is plays an important role in providing information to the public through various platform such as traditional media and also a digital media. In March 2020, the government had announced for the Movement Control Order (MCO) due to the outbreak of COVID-19 in Malaysia. Due to this globalization, COVID-19 shows that the world is at great risk of disruption by pandemic outbreak. However, social media as a medium for promoting campaign during Covid-19 also have its own weakness which challenge of identifying promoted content. The social media sites became one of the important essential sources of information and a platform for dangerous rumormongering. Thus, it also under severe pressure to regulate misinformation about the disease which is leading people in the wrong direction. Therefore, the purpose for this research is about to identify the level of the effectiveness campaign during COVID-19 towards the media user among Malaysians. Researcher have used quantitative survey and the survey has been distributed to all social media platform from various people. In, sampling researcher have referred to Roasoft Sample Size Calculator (2004). The total number of respondents is 162. The findings of this research show the effectiveness of social media campaign during COVID-19 is high M=3.4. Furthermore, based on the finding, there is significant different between sex, that male is more effective by promoting campaign during COVID-19 with significant different 0.262.

Revisit the Huff Model: A Review on the Factors Affecting the Potential of Development Site for Shopping Mall

*S Abdullah[1], A A Razak[2] and M H Hanafi[2]

[1]Faculty of Architecture and Ekistics, Universiti Malaysia Kelantan, 16300 Bachok, Kelantan
[2]School of Housing Building and Planning, Universiti Sains Malaysia, 11800 Pulau Pinang

Abstract. The selection of a commercial real estate development site, especially for a shopping mall or complex, must be carried out carefully to ensure that the development results will produce a good return for the investors. Various approaches have been highlighted to determine the potential possessed by a site proposed for the development of a shopping mall, for example, by conducting the feasibility study, market study, site analysis, and others. In addition, the potential of the shopping complex development site can also be determined through the use of the Huff Model (HM). Through this model, a shopping complex development site's potential is determined by referring to the two main components: "Size of shopping mall" and "Traveling time to the shopping mall." However, the adequacy to consider these two components as the primary basis for determining a shopping mall development site's true potential has been questioned by various parties. This study has been implemented to identify other components that should also be considered part of the main determinants of the shopping mall development site's real potential.

A Multi-dimensional Approach to Managing English for Specific Purposes (ESP) Courses and Assessment Practices in Technical and Engineering Education Context

*N.Ahmad[1] , Z.A.Sayadi[2] , N.Danuri[3] and S. Ismail[4]

[1]Industrial Linkages Section, Universiti Kuala Lumpur Malaysia France Institute, Seksyen 14, Jalan Teras Jernang, 43650 Bandar Baru Bangi,Selangor, Malaysia.
[2,3,]Centre for Language Studies, Universiti Tun Hussein Onn Malaysia, Parit Raja 86400 , Johor, Malaysia.
[4]SMK Putrajaya Presint 9(2), Presint 9, 06220, Putrajaya, Malaysia

Abstract. Although the expansion of the language education domain at higher institutions in Malaysia saw active incorporation of the validity, reliability, impact, practicality and quality (VRIPQ) framework; the aligning of English curriculum to the Common European Framework of Reference (CEFR) model and the increased embrace of English for Specific Purposes (ESP) principles, language educators still need to address issues to ensure the courses are well managed and the intended outcomes are achieved. All these take place within the backdrop of continuous lament and outcry from the employers and the public on graduates' lack of command and mastery of language and communication skills. In addition,the roles of language educators at tertiary level have become more complex as 21st century education and sustainable development goals (SDGs) demand elements of critical thinking, creativity, innovation, awareness and integrity to be incorporated in the curriculum so that these traits could be internalised in the undergraduates. These complex set of goals, expected outcomes and demands to be addressed, raise the questions on the ways and approaches to be undertaken in managing the English language courses in terms of content development, assessments and delivery. This qualitative study aims to investigate the ways in which key English educators manage the ESP courses they offer at their respective institutions, the factors that govern their management practices and the challenges that they face and mitigate to ensure course effectiveness. By exploring all these, strategies for a continuous improvement of ESP courses could be identified and put forth. Nine senior English educators holding various key designations from three engineering and technical related public universities participated in the study by providing qualitative inputs in the form of self-reflections, perceptions, opinions and anecdotal evidence to interview questions on the managing of the ESP courses and the assessment components. This study found that the managing of the ESP courses offered at the universities calls for a multi-dimensional approach due to the diverse nature of the English language, the learners' profile, the contextualisations and the challenges to be mitigated. This study unearthed a multitude of factors and educational realities that governed the educators' practices in managing ESP courses. The multi-dimensional managing efforts demonstrated by educators also reflected a range of conformity to best practices in ESP and assessment principles.

Effectiveness in Applying Affective Domain Values for Technological Science and Engineering in Islam Course (STK) at Sultan Abdul Halim Mu'adzam Shah Polytechnic (POLIMAS). A case study at the Department of Mechanical Engineering and Civil Engineering, December 2019 Session

*A G Ruslinawati[1], M Nuzaimah[1], and C M Normah[2]

[1]Jabatan Pengajian Am, Politeknik Sultan Abdul Halim Mu'adzam Shah, 06000, Jitra, Kedah, Malaysia.
[2]Jabatan Kejuruteraan Mekanikal, Politeknik Sultan Abdul Halim Mu'adzam Shah, Jitra,06000, Kedah, Malaysia.

Abstract. This quantitative descriptive study is in the form of case study of how this institution examines student's achievement according to affective domain level, student's achievement according to grade as well as comparing student's achievement according to their respective programmes in the Department of Mechanical Engineering (JKM) and Department of Civil Engineering (JKA) at POLIMAS. Data collection was done through textual methods and the data obtained were analyzed deductively and inductively. The quantitative study sample is derived from the continuous assessment record (CA) of students who took the STK course curriculum (MPU23052) for the December 2019. On average, this study has achieved all the objectives set and it is discovered that students obtain high CA marks which meets the criteria and standards issued by the Malaysian Qualifications Agency (MQA) [1] which is one of the initiatives made by the Department of Polytechnic Studies. However, this study also aims to identify the achievement of low affective domain taxonomy so that improvements in curriculum development or in terms of teaching and learning (TnL) and assessment could be made. It covers the acquisition of data used to assess the level of course achievement offered by a program towards supporting the achievement of program learning outcomes.

A Brief Overview of Knight's Tour Algorithm in Image Steganography

Tassvini Gunaseharan[1], *Yusliza Yusoff[1], Suhaila Mohamad Yusuf[1], Habibollah Haron[1], Rashidah Kadir[1], Roslan Armina[1], Dewi Nasien[2], Hairudin Abdul Majid[1], and Roselina Sallehuddin[1]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, 81300 Skudai, Johor Bahru, Johor, Malaysia
[2]Department of Information Technology, Institut Bisnis dan Teknologi Pelita Indonesia, Indonesia

Abstract. With the development of transmission technologies, large quantity of personal data is being transferred in digital type which ends up in endless threat of copyright, ownership and integrity of digital information issues. This happen because people prefer to transfer images over social media or other Internet communication platform such as WhatsApp, Telegram and Instagram. Steganography has played an important part in the field of communication, especially in image steganography. There are multiple algorithms available to improve the Steganography image quality, however, the usage of Knight's Tour Algorithm in image Steganography is still lacking. Therefore, in this paper, the implementation of Knight's Tour Algorithm in image Steganography literatures from 2008 until 2020 are reviewed. From overall overview, it is observed that Knight's Tour Algorithm was proposed by the researchers mainly in term of improving the security and robustness. The general flow and advantages of Knight's Tour Algorithm in images steganography is presented as the findings of this paper.

A Comparative Study on Applied Null Hypothesis Feature Selection Technique in Crime Forecasting

*Alif Ridzuan Khairuddin[1], Razana Alwee[1] and Habibollah Haron[1]

[1]Applied Industrial Analytics Research Group (ALIAS), School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, 81310, Johor Bahru, Johor, Malaysia

Abstract. In criminology study, crime trend and occurrence was mostly influenced by various factors such as social mistreatment and economic disadvantages. From the literature, there are various approaches used by researchers in identifying the significant factors that influence crime. Among these, an application of the feature selection technique in identifying the significant relationship between factors and crime became a popular option. Feature selection is helpful in providing statistical evidence in determining the relevance of the factors towards crime data. Motivated by this, this study aims to conduct a study on the application of three null hypothesis feature selection techniques namely F-test, T-test, and sign test in identifying the significant factors. The identified significant factors are then used to develop the crime forecasting model based on artificial intelligence (AI) technique called gradient tree boosting (GTB). The developed crime model is then used in predicting the United States (US) crime rate data. The experimental results show that F-test and T-test yield a significant improvement in terms of quantitative error towards the GTB crime model while a sign test shows the opposites. The contribution of this study is to highlight the importance of identifying significant factors that affect the accuracy of the crime model in forecasting crime rate.

A Modified Cuckoo Search Algorithm and Its Applications in Function Optimization

Shao-Qiang Ye[1], Fang-Ling Wang[2] and *Kai-Qing Zhou[2]

[1]College of Mathematics and Statistics, Jishou University, Jishou, 416000, Hunan, China
[2]College of Information Science and Engineering, Jishou University, Jishou, 416000, Hunan, China

Abstract. A modified Cuckoo search algorithm (MCS) is proposed in this paper to improve the accuracy of the algorithm's convergence by implementing random operators and adapt the adjustment mechanism of the Levy Flight search step length. Comparative experiments reveal that MCS can effectively adjust the search mechanism in the high-dimensional function optimization and converge to the optimal global value.

A Novel Multiple Person Pose Estimation Optimization Model Utilizing Genetic Algorithm

Qing Zhang[1], *Lei Ding[1], Kai-Qing Zhou[1] and Jian-Feng Li[1]

[1]College of Information Science and Engineering, Jishou University, Jishou, 416000, Hunan, China

Abstract. For traditional human pose estimation models rely on a large amount of human body feature information,this paper proposes an optimization model using genetic algorithm to solve the problem of multiple person body part assembly.Different from other human body parts assembly method.the method proposed in this paper depends on the joints position information, namely the sum of the connection distances between the joints as the objective function, and finds the optimal value to obtain the best human pose assembly information. The simulation results shows that compared with the traditional OpenPose model, the model proposed in this paper can obtain the same human skeleton using less position information.

A Review of Breast Cancer Histopathological Image Classification

*Lei Huang[1], Azlan Mohd Zain[1,2], Kai-Qing Zhou[3] and Chang-Feng Chen[1]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, UTM Skudai, Johor Bahru, Johor, Malaysia
[2]UTM Big Data Centre, Universiti Teknologi Malaysia, UTM Skudai, Johor Bahru, Johor, Malaysia
[3]College of Information Science and Engineering, Jishou University, Jishou, Hunan, China

Abstract. Breast Cancer (BC) is the most common malignant tumor for women in the world. Histopathological examination serves as basis for breast cancer diagnosis. Due to the low accuracy of histopathological images through manual judgment, the classification of histopathological images of breast cancer has become a research hotspot in the field of medical image processing. Accurate classification of images can help doctors to properly diagnoses and improve the survival rate of patients. This paper reviews the existing works on histopathological image classification of breast cancer and analysis the advantages and disadvantages of related algorithms. Findings of the histopathological image classification of the Breast Cancer study are drawn, and the possible future directions are also discussed.

A Review of Classification on Credit Repayment Default Behaviour using Machine Learning Algorithms

*Massalina Ismail[1], Hafiza Abas[1], Roslinda Ramli[2] and Rahmah Lob Yussof[3]

[1]Razak Faculty of Technology and Informatics, Universiti Teknologi Malaysia, Jalan Sultan Yahya Petra, 54100 Kuala Lumpur
[2]Fakulti Sains dan Teknologi Maklumat, Kolej Universiti Islam Antarabangsa Selangor, Bandar Seri Putra, 43600 Bangi Selangor
[3]Faculty of Computer and Mathematical Sciences Universiti Teknologi MARA Pahang Branch Raub Campus, 27600 Raub Pahang, Malaysia

Abstract. Youth participation in the market either through employment in industry or starting up a business is significant in accelerating Malaysia's economic growth. However, having a lack of finance leads them to apply credit facilities to meet their living expectations. Challenges in life such as the increase in commitment as age increases, slow progress on a salary increase, and status level of youth may affect the ability for the youth to make the repayment on their credit loan and causing the credit repayment to have defaulted. A higher default rate of credit repayment impacts the sustainability of all credit facilities providers. There are two reason youth default credit repayment, either the young customer does not have enough money to pay due to lack of income, or they have the means to pay but choose not to pay. To reduce the rate of default credit repayment among young customers, it is important for credit facilities to study whether the default is due to lack of income or the consumer's behaviour. Machine learning classification algorithm able to classify youth customers into these two categories. The assumption of the findings is the youth customer credit repayment default is due to lack of income instead of because of their behaviour.

A Review of Simulation and Application of Agent-Based Model Approaches

*Ling Sie Chiew[1], Shahabuddin Amerudin[1] and Zainab Mohamed Yusof[3]

[1]Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia.

[2]School of Civil Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia

Abstract. In the past, various traditional methods used experiments and statistical data to examine and solve the occurred problem and social-environmental issue. However, the traditional method is not suitable for expressing or solving the complex dynamics of human environmental crisis (such as the spread of diseases, natural disaster management, social problems, etc.). Therefore, the implementation of computational modelling methods such as Agent-Based Models (ABM) has become an effective technology for solving complex problems arising from the interpretation of human behaviour such as human society, environment, and biological systems. Overall, this article will outline the ABM model properties and its applications in the criminology, flood management, and the COVID-19 pandemic fields. In addition, this article will review the limitations that occurred to be overcome in the further development of the ABM model.

A Study of University Website Content Classification Using Machine Learning

*Mohd Sharul Hafiz Razak[1], Nor Azman Ismail[1] and Su Elya Mohamed[1]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, Skudai, Johor

Abstract. A university website is a gateway to the institution's information, products, and services. As websites grow into millions in numbers, it is essential to ensure that the content reflects the needs of its students, staff, and other academic institution as their primary users. This research investigates the development of a new framework that uses machine learning techniques based on webometrics and web usability to classify the web pages of academic websites automatically. The framework briefly introduced how it can help classify web content and eliminate unrelated content and reduce storage space. The findings can also be used to analyse other web-based data to give additional insights that may be beneficial for webometrics studies and identify university websites' characteristics.

A Study on the Alternative of Traditional Netball Teaching by Using Multimedia Online Netball Teaching

Norshafina Shafie[1], *YuslizaYusoff[2], Rahmah Yusak[3], Raihani Ismail[4], and Nur Faezah Mohd Fauzi[5]

[1]School of Electrical, Faculty of Engineering, Universiti Teknologi Malaysia, 81300 Skudai, Johor Bahru, Johor, Malaysia
[2]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, 81300 Skudai, Johor Bahru, Johor, Malaysia
[3]UTM Sports Excellence, Office of Deputy Vice Chancellor, Universiti Teknologi Malaysia, 81300 Skudai, Johor Bahru, Johor, Malaysia
[4]Sekolah Kebangsaan Taman Kota Kulai, Persiaran Sri Putri 2, Taman Putri, 81000 Kulai, Johor, Malaysia
[5]Faculty of Built Environment and Surveying, Universiti Teknologi Malaysia, 81300 Skudai, Johor Bahru, Johor, Malaysia

Abstract. The purpose of this study is to highlight the benefits of teaching basic netball skills virtually. Netball is one of the high potential sports in Malaysia, but the number of young talents for this sport is inadequate. Traditionally, netball teaching is done face to face in schools. However, during the Covid-19 pandemic, all contact sports are banned due to the restriction of movement and restriction of outdoor activities to prevent the spread of the virus. Thus, this method is proposed to overcome this dilemma and ensure our society could practice a healthy lifestyle while staying at home during this Covid-19 pandemic season. Multimedia online teaching will provide beneficial knowledge through interactive media and e-module which can be accessed by more students and all netball fans. A project and survey has been conducted on teaching basic netball skills and 75% of the participants understand the objectives conveyed on the materials provided. This shows that multimedia online netball teaching can provide necessary information to participants through online platform.

Accuracy and Convergence Analysis of uFA-FastSLAM for Robot and Landmarks Position Estimation

R J Musridho[1], H Hasan[2,3], H Haron[2,3], D Gusman[1] and M A Mohammad[4]

[1]Dept. of Informatics Engineering, Faculty of Engineering, Universitas Pahlawan Tuanku Tambusai, Bangkinang Kota 28412, Indonesia

[2]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, Johor Bahru 81310, Malaysia

[3]Applied Industrial Research Group, Universiti Teknologi Malaysia , Johor Bahru 81310, Malaysia

[4]iKohza Software Engineering for Industrial Revolution, Malaysia-Japan International Institute of Technology (MJIIT), Universiti Teknologi Malaysia, Kuala Lumpur 54100, Malaysia

Abstract. In autonomous mobile robots, Simultaneous Localization and Mapping (SLAM) is a demanding and vital topic. One of two primary solutions of SLAM problem is FastSLAM. In terms of accuracy and convergence, FastSLAM is known to degenerate over time. Previous work has hybridized FastSLAM with a modified Firefly Algorithm (FA), called unranked Firefly Algorithm (uFA), to optimize the accuracy and convergence of the robot and landmarks position estimation. However, it has not shown the performance of the accuracy and convergence. Therefore, this work is done to present both mentioned performance of FastSLAM and uFA-FastSLAM to see which one is better. The result of the experiment shows that uFA-FastSLAM has successfully improved the accuracy (in other words, reduced estimation error) and the convergence consistency of FastSLAM. The proposed uFA-FastSLAM is superior compared to conventional FastSLAM in estimation of landmarks position and robot position with 3.30 percent and 7.83 percent in terms of accuracy model respectively. Furthermore, the proposed uFA-FastSLAM also exhibits better performances compared to FastSLAM in terms of convergence consistency by 93.49 percent and 94.20 percent for estimation of landmarks position and robot position respectively.

Achievements of Japanese College Student Volunteers in Teaching ICT Skills to Children

*Kaori Tsukazaki[1], Takeshi Shintoku[2], and Takaaki Fukuzoe[3]

[1]Department of Liberal Arts and Sciences, National Institute of Technology, Kagoshima College, 1460-1 Shinko Hayato Kirishima Kagoshima, Japan
[2]Department of Information Engineering, National Institute of Technology, Kagoshima College, 1460-1 Shinko Hayato Kirishima Kagoshima, Japan
[3]Department of Electronic Control Engineering, National Institute of Technology, Kagoshima College, 1460-1 Shinko Hayato Kirishima Kagoshima, Japan

Abstract. Female students at a national college of technology in Japan have been teaching ICT skills to children for two years in order to foster interest in STEM and introduce them to role models through workshops. This is because the number of female students in STEM, especially engineering, is extremely low in Japan compared with other countries. The purpose of this paper is to introduce the female student volunteers' achievements over a two-year period. First, it seems that they contributed to increasing the number of new female students who entered their college in 2019. Second, this project was introduced in *the White Paper on Gender Equality 2019* published by the Japanese government. Third, the good reputation they had built up makes it possible to receive support from industry and the board of education in the local government when they hold workshops in schools. Finally, judging from the feedback of the participants in a workshop, the college volunteers were successful in teaching ICT skills to junior high school students in an enjoyable way.

An Efficient CNN Approach for Facial Expression Recognition

Gheyath Mustafa Zebari[1], *Dilovan Asaad Zebari[2], Diyar Qader Zeebaree[3], Habibollah Haron[4], Adnan Mohsin Abdulazeez[5], Kamil Yurtkan[1]

[1]Cyprus International University Nicosia, Northern Cyprus, Turkey
[2]Center of Scientific Research and Development Nawroz University, Duhok, Kurdistan Region, Iraq
[3]Director of Research Center of Duhok Polytechnic University, Duhok, Kurdistan Region, Iraq
[4]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, Johor Bahru 81310, Malaysia
[5]Presidency of Duhok Polytechnic University, Duhok, Kurdistan Region, Iraq

Abstract. In the last decade, the Facial Expression Recognition field has been studied widely and become the base for many researchers, and still challenging in computer vision. Machine learning technique used in facial expression recognition facing many problems, since human emotions expressed differently from one to another. Nevertheless, Deep learning that represents a novel area of research within machine learning technology has the ability for classifying people's faces into different emotion classes by using a Deep Neural Network (DNN). The Convolution Neural Network (CNN) method has been used widely and proved as very efficient in the facial expression recognition field. In this study, a CNN technique for facial expression recognition has been presented. The performance of this study has been evaluated using the fer2013 dataset, the total number of images has been used. The accuracy of each epoch has been tested which is trained on 29068 samples, validate on 3589 samples. The overall accuracy of 69.85% has been obtained for the proposed method.

An Investigation of Emotion Detection Approaches

*Asraful Syifaa' Ahmad[1], Rohayanti Hassan[1], Noor Hidayah Zakaria[1] and Shahliza Abd Halim[1]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, Malaysia

Abstract. Emotion detection has gained attention in many fields as its application is needed in education, marketing, surveying, and psychology. With advanced and emerging technology nowadays, emotion detection or recognition is practicable in the real world. However, there are several issues that cause the reduction of accuracy in each detection. In order to counter the problem, basic information of emotion detection is necessary. Thus, the objective of this paper is to provide a brief review of existing approaches in the specialized literature. The literature related to emotion detection are searched using all the relevant keywords. A systematic review is performed by analysing 181 primary studies, and 22 research papers are selected to determine the taxonomy, approaches, and limitations of emotion detection. Therefore, this work provides an overview of an insight into the current understanding of emotion detection whilst identifying future research possibilities.

Augmented Reality Travel Application with Guide Book Marker for Tourist Attractions

*N I S Nasaruddin[1], M K M Suzami[1], K A F A Samah[1], N Z A Rahim[1], S F M Rum[1] and F I Saman[1]

[1]Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA Cawangan Melaka Kampus Jasin, Melaka, Malaysia

Abstract. This paper describes the development of Augmented Reality travel application for tourist attractions. Tourism is one of the main sources of income for the economy in Malaysia. Unfortunately, the recent outbreak of covid-19 has slowed down the process. Our economy has been greatly affected by the outbreak. Since the traditional way of promotion which is using brochure, guide book and website is cannot be used effectively in the outbreak, therefore the alternative way to do is by using technology. Additionally, the traditional promotion makes tourist lack of visualization of tourism view and information about tourism place. Thus, this paper is about AR with guide book marker as an alternative promotion for tourism. Preliminary analysis also has been done to support main problem of this research. Methodology that uses in this research is ADDIE Model which to ensure project of this research smoothly. Then the usability test is done by using USE Questionnaire. The average score of usability test is 88.25% which means a good rating score. Moreover, this research paper should be a stepping stone for tourist researches for increase various of way in promoting tourism of Malaysia.

Autonomous Underwater Vehicle (AUV) in Internet of Underwater Things (IoUT): A Survey

*Chinonso Okereke[1], Nur Haliza Abdul Wahab[1], Mohd Murtadha Mohamad[1] and S. Zaleha. H[1]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, Malaysia

Abstract. Water, mostly oceans, covers over two-third of the earth. About 95% of these oceans are yet to be explored which includes 99% of the sea-beds. The introduction of Internet of Underwater Things (IoUT) in underwater has become a powerful technology necessary to the quest to develop a SMART Ocean. Autonomous Underwater Vehicles (AUVs) play a crucial role in this technology because of their mobility and longer energy storage. In order for AUV technologies to be effective, the challenges of AUVs must be adequately solved. This paper provides an overview of the challenges of IoUT, the contributions of AUVs in IoUT as well as the current challenges and open in AUV. A summaries and suggestion for future work was discussed.

Big Data Technology Towards Digital Library Services – An Overview

*Azlan Mohd Zain[1], Mohammed Kaka Ahmed[1], Ayyah A.Mamoud[1] and Fify Farisha Asmawali[1]

[1]UTM Big Data Centre, Universiti Teknologi Malaysia, 81310, Skudai Johor Malaysia

Abstract. The huge increment number of collections in library might require the use of big data technology towards digital library (DL). Traditional library needs to be modernized in terms of infrastructure with big data technology such as storage, mining, analytics and visualization. With a powerful of big data technology, library can be manged in more effectively. The big data technology towards DL services in two perspectives are discussed, which are DL innovation and DL challenges. Furthermore, we discuss the characteristics of big data adoption, and then summarize the big data tools to be adopted for digital library services.

Bridging Japan's Urban Rural Divide in Children's ICT Skills with Female College Volunteers

*Kaori Tsukazaki[1], Takeshi Shintoku[2], and Takaaki Fukuzoe[3]

[1]Department of Liberal Arts and Sciences, National Institute of Technology, Kagoshima College, 1460-1 Shinko Hayato Kirishima Kagoshima, Japan
[2]Department of Information Engineering, National Institute of Technology, Kagoshima College, 1460-1 Shinko Hayato Kirishima Kagoshima, Japan
[3]Department of Electronic Control Engineering, National Institute of Technology, Kagoshima College, 1460-1 Shinko Hayato Kirishima Kagoshima, Japan

Abstract. The educational situation in rural parts of Japan is very different from that in Tokyo and its surrounding areas. When it comes to STEM, children in rural areas have less opportunities to get involved in pleasurable STEM workshops or meet attractive role models in the related field. Therefore, female students of a national college of technology in a local city started a project to teach ICT skills to children with a robot. Their goal is to motivate younger generations to learn STEM and introduce them to female role models. They hope to increase the number of female students in STEM, which has been very low for decades. The purpose of this paper is to focus our attention on Japan's urban rural divide in STEM education, especially teaching ICT skills to children. With the help of the local boards of education and industry who appreciated the project to increase the number of female students in STEM, the college student volunteers held four workshops within two months. Judging from a questionnaire after one of the workshops, it seemed that the workshop was successful in motivating most of the participants in that they got interested in more advanced computing and robotics.

Classifying Ovarian Cancer Using Deep Learning Method Based On Multi-Omics Data

*Hairudin Abdul Majid[1], Azurah A. Samah[1], Nuraina Syaza Azman[1], Haslina Hashim[1], Zuraini Ali Shah[1], Muhammad Faiz Misman[1], Weng Howe Chan[1] and Yusliza Yusuf[1]

[1]Artificial Intelligence and Bioinformatics Research Group, School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia 81310 Skudai, Johor, Malaysia

Abstract. Analysis that use multi-omics provide reliable information about disease mechanism and promotes better understanding of complex diseases like cancer. Hence, in recent years researchers are motivated to conduct study with complex deep learning models, obtaining more reliable result using multi-omics data. In this study, Stacked Denoising Autoencoder and Long-Short Term Memory, two deep learning methods based on multi-omics data were employed for classifying the ovarian cancer. Three types of omics data including Gene expression, DNA methylation and miRNA data were collected from the ovarian cancer dataset, obtained from Multi-Omics Cancer Benchmark TCGA Preprocessed Data. After data preprocessing, dimensionality reduction and data integration, each type of omics data were input into both SDAE and LSTM. The performance of both SDAE and LSTM based on multi-omics data were analyzed and compared. From the results, LSTM outperformed SDAE, with higher accuracy and low value of loss.

Comparison Between Louvain and Leiden Algorithm for Network Structure: A Review

*Siti Haryanti Hairol Anuar[1,2], Zuraida Abal Abas[2], Norhazwani Mohd Yunos[2], Nurul Hafizah Mohd Zaki[2], Nurul Akmal Hashim[2], Mohd Fariddudin Mokhtar[2,3], Siti Azirah Asmai[2], Zaheera Zainal Abidin[2] and Ahmad Fadzli Nizam[2]

[1]Faculty of Electrical and Electronic Engineering Technology (FTKEE), Universiti Teknikal Malaysia Melaka (UTeM), 76100 Malacca, Malaysia
[2]Faculty of Communication and Information Technology (FTMK), Universiti Teknikal Malaysia Melaka (UTeM), 76100 Malacca, Malaysia
[3]Faculty of Mechanical and Manufacturing Engineering Technology (FTKMP), Universiti Teknikal Malaysia Melaka (UTeM), 76100 Malacca, Malaysia

Abstract. In the real network, there must be a large and complex network. The solution to understand that kind of network structure is using the community detection algorithms. There are a lot of other algorithms out there to perform community detection. Each of the algorithms has its own advantages and disadvantages with different types and scale of complex network. The Louvain has been experimented that shows bad connected in community and disconnected when running the algorithm iteratively. In this paper, two algorithm based on agglomerative method (Louvain and Leiden) are introduced and reviewed. The concept and benefit are summarized in detail by comparison. Finally, the Leiden algorithm's property is considered the latest and fastest algorithm than the Louvain algorithm. For the future, the comparison can help in choosing the best community detection algorithms even though these algorithms have different definitions of community.

Computer-Assisted in Coiled Tubing Perforation Limitations: A Case Study from MA-X Gas Well

*Kung Yee Han[1], Akhmal Sidek[1], Aizuddin Supee[2], Radzuan Junin[1], Zaidi Jaafar[1], Ahmad Nabil Md Nasir[3], Zakri Tarmidi[4] and Shaziera Omar[1]

[1]Petroleum Engineering Department, School of Chemical & Energy Engineering, FE, Universiti Teknologi Malaysia, Johor Bahru, Johor, Malaysia
[2]Energy Engineering Department, School of Chemical & Energy Engineering, FE, Universiti Teknologi Malaysia, Johor Bahru, Johor, Malaysia
[3]Technical & Vocational Department, SOE, FSSH, Universiti Teknologi Malaysia, Johor Bahru, Johor, Malaysia
[4]Geoinformation, FABU, Universiti Teknologi Malaysia, Johor Bahru, Johor, Malaysia

Abstract. This paper seeks to determine the optimum operating conditions for deploying casing perforation guns based on CT to target depths in gas well MA-X by utilising Orpheus Model in CERBERUS. Orpheus assisted to solve the complicated scenarios and complex analysis involves mathematical modelling which is necessitates for computer processing powers. This study investigated four different Coiled Tubing (CT) intervention operational variables namely borehole assembly, CT grade outer diameter (OD), well fluid type and fractional reducer application included examined two scenarios which are running tools in (RIH) and pulling out from borehole (POOH). Only CT workstring with outer diameter between 1-1/4 inch and 2-7/8 inch is considered due to the wellbore completion minimum restriction. Constrained by economic and logistical reasons, only fresh water, 2% KCl, 15% HCl, sea water and diesel will be considered for the well bore fluid. Fractional reducer effects was simulated and analysed. Based on simulation results, the CT outer diameter 1-3/4 inch workstring optimized operation, the CT grade is QT1000 increased mechanical properties. A suitable well fluid is sea water with application of friction reducer improve CT perforation performances to achieve maximum target depth.

Crowd Emergency Evacuation Simulation Time Analysis via Obstacle Optimization Strategy

*Hamizan Sharbini[1], Roselina Sallehuddin[2] and Habibollah Haron[2]

[1]Faculty of Computer Science and Information Technology, Universiti Malaysia Sarawak, Malaysia
[2]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, Johor Bahru, Johor, Malaysia

Abstract. The crowd evacuation simulation is essential to provide important results for occupants especially in large capacity building compared to human fire drill exercise. The evacuation simulation is essential for human safety. The strategy of evacuation such as the use of obstacle may need to be adapted by many organization as an aid to help in visualizing and estimating the evacuation time during emergency. During certain crowd event, they may consider various setting of object to ensure smoothness and effective crowd evacuation flow. In this paper, it aims to provide the simulation with 100-1000 agents and testing with obstacle using Anylogic tool and analysis of evacuation time validated using SPSS. The results shows that the placement of obstacle near exit way indeed can reduce the evacuation time and complies to anti-arching phenomenon during evacuation.

Cuckoo Search Algorithm for Modeling of Flexible Manipulator System

Aiman Azrael Shaiful Nahar Sukri[1], *Hanim Mohd Yatim[2], Muhamad Sukri Hadi[1], Mat Hussin Ab Talib[2] and Intan Zaurah Mat Darus[2]

[1]Faculty of Mechanical Engineering, Universiti Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia.
[2]School of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 Skudai, Johor, Malaysia

Abstract. Flexible manipulators are one of the promising devices that can be applied in many applications. Flexible manipulators are designed to reduce energy consumption, higher precision and increase the speed of operation. However the agitation process experienced in the complex structure caused by unwanted vibration may affect the precision of operation. Thus, an accurate model are required in order to fully utilized the advantages of the system. Initially, the system was modeled using system identification (SI) method via Cuckoo Search (CS) algorithm based on auto regressive with exogenous (ARX) model structure. Input and output data for flexible manipulator system was collected experimentally. Next, performance of Cuckoo Search modeling was compared with Recursive Least Square (RLS) modeling based on mean squared error (MSE), pole zero diagram stability and correlation test. Results showed that CS modeling outperformed RLS with lower MSE value of 3.1952×10^{-7}. The best model obtained can next be utilized for future analysis of vibration control of flexible manipulator system.

Current Use and Practice of Big Data - An Overview

*Azlan Mohd Zain[1], Mohammed Kaka Ahmed[1], Ayyah A.Mamoud[1] and Fify Farisha Asmawali[1]

[1]UTM Big Data Centre, Universiti Teknologi Malaysia, 81310, Skudai Johor Malaysia

Abstract. This paper discusses the current use and practice of big data by industries in Malaysia. The impact of big data practices in six industrial sectors are highlighted, which are healthcare, education, financial, security, agriculture and airline. Based on the results of study, some findings are summarized. Big data provided many benefits to the healthcare industry ranging from detection of diseases to the prediction of medical complications. Big data analytic can help education sector to provide influential data for classroom activities. Big data contributed on making all Malaysian banking platforms digital, therefore all operation can be done from all over the places. For national security, big data tools are recommended to identify the possible future threatening situations. Furthermore, big data analytic could assist the decision making of what crops to plant in agriculture and farming industry. Finally, result of study has shown that big data analytics are also able to provide smart aircraft maintenance in airline industry.

Cyclist Performance Monitoring Application (CPMA)

*Yusliza Yusoff[1], Nurul Anis Syahirah Kasim[1], Sharifah Zarith Rahmah Syed Ahmad[1], Nurul Farha Zainuddin[2], Azurah A Samah[1] and Azlan Mohd Zain[1]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor Bahru, Johor, Malaysia
[2]Faculty of Sports Science and Recreation, Universiti Teknologi Mara, 02600 Arau, Perlis, Malaysia

Abstract. As the current practice, the cycling athletes of Sekolah Sukan Tunku Mahkota Ismail (SSTMI) are monitored by the coaches manually. At times, the coach or athlete will lose the recorded data. As a consequence, it is difficult to record and analyse cycling training performances of the athletes. The study purposes a systematic method to assist the SSTMI's coaches to monitor their athletes training performances. Thus, a mobile application namely Cyclist Performance Monitoring Application (CPMA) is developed to proposed a more systematic method for coaching and performance monitoring tool. CPMA was develop base on user requirement survey ensuring the significant function required by the coaches. CPMA allows the athletes to sync their training data from wearable devices to the application and accessible by both users, coaches and athletes. Additionally, the coaches are able to challenge athletes for designated training remotely to improve the athlete's performances. CPMA provides cycling coaches of SSTMI a platform to monitor their athlete's performances systematically and improve the performances of their athletes for upcoming competition.

Deep Learning to Handle Congestion in Vehicle Routing Problem: A Review

*D Satyananda[1,2] and A Abdullah[1]

[1]School of Computing, Universiti Teknologi Malaysia, 81310 Skudai, Johor Bahru, Johor, Malaysia
[2]Mathematics Department, Universitas Negeri Malang, Jl. Semarang 5, Malang 65145, Indonesia

Abstract. Congestion and traffic condition are usually avoided in VRP due to its modelling complexity, and even the benchmark datasets only cover essential conditions. In the real situation, the traffic condition is varied, and congestion is the worst part. To model real life, then the delivery route must consider these situations. The vehicle needs information on traffic prediction in future time to avoid congestion. The prediction needs historical traffic data, which is very large. Deep Learning can handle the enormous size and extract data features to inference the prediction. This paper reviews the implementation design of Deep Learning in VRP.

Deregulated Market Model For Upstream Market In Malaysia Electricity Supply Industry Using System Dynamics Approach: Tariffs Overview

*N H Ahmad[1], N D Dahlan2, N E N Bazin3, T K A Rahman4, M M Hussain1, S A M Salleh1

[1]Fac.of Electrical Eng, Universiti Teknologi MARA Johor Branch, Pasir Gudang Campus, 81750 Johor
[2]Fac.of Electrical Eng, Universiti Teknologi MARA, 40450 Shah Alam, Selangor
[3]School of Computing, Fac.of Engineering, Universiti Teknologi Malaysia, 81310 Johor Bahru, Johor
[4]School of Science & Technology, Asia e-University, 47500 Subang Jaya, Selangor

Abstract. Since forever, electricity has become a fundamental source for energy that will affect the social and economic development regardless in any country; either developed or developing country. Therefore, a thorough research and planning in this field are highly concerned throughout the years. Out of all research interests in electricity supply industry, end user tariff has been among the highly anticipated research. Research on how to provide electricity with a good tariff has been made countless times. Therefore, the goal of this paper is to establish the deregulated market model for upstream market in Malaysia electricity supply industry using System Dynamics approach. Given that system dynamics is a well-known approach in modelling the real-world scenario of any system, the simulation shows that the model is somewhat illustrate the real-world scenario of electricity market model in Malaysia. This research is using data from Energy Commission of Malaysia and Tenaga Nasional Bhd (TNB).

Design and Development of Smartphone Application Control

*Siti Malihah Mohd Yusof[1], Munirah Mohd Yusof[1] and Hanayanti Hafit[1]

[1]Faculty of Computer Science and Information Technology, Universiti Tun Hussein Onn, Malaysia

Abstract. Smartphone Application Control is a project designed to block other phone applications that have excessive use by users. Excessive phone use is often experienced by children aged 7-18 years old. At the same time, many parents nowadays do not have time all day long to monitor and limit the use of their children's phone due to work. The efforts of the mass media to advise on the use of phone do not give much positive impact on these children. Therefore, a robust alternative such as Smartphone Application Control is essential to curb these issues. To develop this application, a methodological approach has been used namely the Evolutionary Prototyping model. Android Studio version 3.6.2 is used to develop this application while SQLite Database acts as a database for storing all application usage statistics and Google-Cloud Firebase is used to store user-related information for user authentication purposes. To create an attractive user interface, Adobe Photoshop CS6 is used to design background and interface buttons. This app is able to track usage hours of other apps and block them if they exceed their daily usage limits. The time limit for such use can only be set by parents. Additionally, notification of excess usage will be sent to parents via email as a notification. A pop-up alert notification will be issued when user has reached his or her application limit. Smartphone Application Control is very important in helping user to control their phone usage behaviour.

Design and Evaluation of An Augmented Reality Book of Malay Literary: Hikayat Misa Melayu

*A.FAbd Shukor[1], C S Said[1], Nor Azman Ismail[2] and A.H Ali[3]

[1]Faculty of Art, Computing and Creative Industry (FSKIK), Universiti Pendidikan Sultan Idris, 35900 Tanjong Malim, Perak, Malaysia.
[2]School of Computing, Universiti Teknologi Malaysia (UTM), Johor Bahru, Malaysia
[3]Faculty of Language and Communication (FBK), Universiti Pendidikan Sultan Idris, 35900 Tanjong Malim, Perak, Malaysia

Abstract. This article reported the design and development of Kata Utama Hikayat Misa Melayu Augmented Reality Book. Misa Melayu in the primary source of Perak state history and is also being adapted as a literature textbook in the local university undergraduate literature course. Misa Melayu uses an old Malays word and its source difficulty among novice students to understand this text. An augmented reality that enables displaying multimedia instructional content by overlying physical textbook offers ease students' cognitive load when reading a complexity text. Therefore, this research was initiated to design and develop an augmented reality book to learn an old Malays term in Hikayat Misa Melayu. A focus group evaluation that was carried out shown that participant agrees that this augmented reality book is valuable to them.

Determination of Vital Cancer Sites in Malaysian Colorectal Cancer Dataset by Using A Fuzzy Feature Selection Method

*Mohamad Faiz Dzulkalnine[1], Roselina Sallehuddin[1], Yusliza Mohd Yussof[1], Nor Haizan Mohd Radzi[1], Noorfa Haszlinna Mustaffa[1] and Lizawati Mi Yusuf[1]

[1]School of Computing, Universiti Teknologi Malaysia, Skudai, 81300 Johor, Malaysia

Abstract. In Malaysia, Colorectal Cancer (CRC) is one of the most common cancers that occur in both men and women. Early detection is very crucial and it can significantly increase the rate of survival for the patients and if left untreated can lead to death. With the lack of high-quality CRC data, expert systems and machine learning analysis are burdened with the presence of irrelevant features, outliers, and noise. This can reduce the classification accuracy for data analysis. Accordingly, it is essential to find a reliable feature selection method that can identify and remove any irrelevant feature while being resistant to noise and outliers. In this paper, Fuzzy Principal Component Analysis (FPCA) was tested for the classification of Malaysian's CRC dataset. With the utilization of fuzzy membership in FPCA, the experimental results showed that the proposed method produces higher accuracy compared to PCA and SVM by almost 2% and 5% respectively. Empirical results showed that FPCA is a reliable feature selection method that can find the most informative features in the CRC dataset that could assist medical practitioners in making an informed decision.

EEMD-LSTM Modelling of Daily Confirmed COVID-19 Cases in Malaysia

*Ani Shabri[1], Siti Nabilah Syuhada Abdullah[1], Ruhaidah Samsudin[2], *Zuriahati Mohd Yunos[2], Anita Fairos Ismail[2] and Aida Ali[2]

[1]Department of Mathematical Sciences, Faculty of Science, UniversitiTeknologi Malaysia, 81310 UTM Johor Bahru, Malaysia

[2]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia

Abstract. World Health Organization announced the state of pandemic on March 11th, 2020 after confirmed cases of COVID-19 exceeded 118,000 cases in over 110 countries globally. Accurately modelling and forecasting the spread of confirmed and recovered COVID-19 cases is vital to help decision-makers in fighting the pandemic. Usually, patterns exhibited in such scenarios are non-linear in nature and this motivates us to design the system that can capture such changes. This study ultimately aims to create a method to forecast new COVID 19 cases using a hybrid of EEMD-LSTM model. Here, the forecasting is performed onto the number of daily confirmed cases of COVID-19 cases in Malaysia from March 13th, 2020 till January 4th, 2021. The dataset was provided by Global Change Data Lab at Oxford University.

Eliciting User Requirement for Flood Monitoring Application

*S E Mohamed[1], N A Ismail[1], A Mukthar[1] and M S Hafiz[1]

[1]School of Computing, Universiti Teknologi Malaysia, Skudai, 81300 Johor, Malaysia

Abstract. Flood disaster is the most disastrous hydrological event that can lead to property destruction and loss of lives. One of the efforts to mitigate the impact is by providing an advance technology in monitoring and event alert. The flood monitoring application is developed to provide real-time weather forecast and disaster warnings. To increase disaster management efficiency, we conducted this research to identify the needs and requirements for a flood monitoring application. The study is mainly focusing on user perspective and preferences. The participant of this survey includes the authorities, non-government agency (NGO) and public. The participant is given a set of questionnaires containing thirteen questions, including the combination of open-ended and close-ended questions covering three sub-topics: user background, user experience, and user knowledge. List of important flood monitoring application features based on user requirements analysis and empathy map has been used to visualize user attitudes and behaviours.

Evaluation of 20 kV Distribution Network Losses In Radial Distribution Systems Due to Distributed Generation Penetration

*H Arnawan[1,2] , I Muzamir[1], I Y Mohd[1], R A R Siti[1] and S Hadi[3]

[1]School of Electrical System Engineering, Universiti Malaysia Perlis, Kampus Tetap Pauh Putra, 02600 Arau, Perlis, Malaysia
[2]Department of Electrical Engineering, Universitas Malikussaleh, Kampus Bukit Indah, Lhokseumawe 24353, Indonesia
[3]Department of Electrical Engineering, Universitas Brawijaya, Lowokwaru Malang 65145, Indonesia

Abstract. The installation of distributed generation with renewable energy becomes a solution when the demand for electricity is increasing and electricity generation with fossil energy is increasingly limited. There has been a change in power flow before and after the installation of distributed generation. However there can be a negative impact on the distribution network losses applicable to reactive power flows. There are cases where the distributed generation capacity is greater than the supplied load, resulting in distributed generation operating as a system voltage regulator and requiring reactive power, so that DG will absorb the reactive power from the system. The increasing demand for reactive power in DG also causes an increase in the current flowing in the network, and causes an increase in losses in the network, especially for the losses in reactive power.

Evaluation of Multiple-Choice Question Generator (MCQ-G) Tool for Computer-Aided Automated Question Generator

*Nor Aiza Moketar[1], Noor Hasimah Ibrahim Teo[1], Nor Azida Mohammad Noh[1], Nurul Huda Ghazali[1] and Nurul Hidayah Mat Zain[1]

[1]Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA, Malaysia

Abstract. Assessment is an important activity in education to measure students' understanding, skills, or knowledge. For this, Multiple Choice Questions (MCQs) are among the common means of objective assessment in both traditional and digital learning environments. There are lot of Automatic Question Generation (AQG) technique introduced to support for the construction of high-quality MCQs. Among of those, the ontology-based question generation method has increasingly popular. We also have presented our proposed approach based on ontology concept to automatically generate MCQs to enable a massive number of questions generated in just a few second. This paper presents the extended evaluation on our tool, MCQ-G, focusing on the features of the tool. The result of the evaluation provides us with the insight for further improvement of the tool.

Global Solar Radiation Forecasting Using Artificial Neural Network and Support Vector Machine

Emmanuel Philibus[1] and *Roselina Sallehuddin[2]

[1]Department of Computer Science, Kaduna State College of Education, Gidan Waya, (Kaduna), Nigeria
[2]Department of Computer Science, School of Computing, Universiti Teknologi Malaysia, Skudai, (Johor), Malaysia

Abstract. Assessment is an important activity in education to measure students' understanding, skills, or knowledge. For this, Multiple Choice Questions (MCQs) are among the common means of objective assessment in both traditional and digital learning environments. There are lot of Automatic Question Generation (AQG) technique introduced to support for the construction of high-quality MCQs. Among of those, the ontology-based question generation method has increasingly popular. We also have presented our proposed approach based on ontology concept to automatically generate MCQs to enable a massive number of questions generated in just a few second. This paper presents the extended evaluation on our tool, MCQ-G, focusing on the features of the tool. The result of the evaluation provides us with the insight for further improvement of the tool.

Goal-Setting Theory and Gamification in Mobile Fitness Application: A Measurement Items Analysis

*Pg Mohd Auza'e Pg Arshad[1], Rohaizat Baharun[1] and Norzaidahwati Zaidin[1]

[1]Azman Hashim International Business School (AHIBS), Universiti Teknologi Malaysia (UTM) 81300 Skudai Johor Bahru, Johor, Malaysia

Abstract. Research efforts at the items development of Goal Setting Theory with gamification have received less attention among scholars especially in mobile fitness application context. The possible reason for this deficiency is the lack of measurement analysis tool and ideas of Goal Setting Theory and gamification from mobile fitness application context. Therefore, the aim of this paper was to develop a scale of measuring Goal Setting Theory and Gamification items based on its conceptualization. Data collected from a survey of fitness centres that used the mobile fitness application, from which 349 respondents filled out questionnaires for this study. The analysed data using the structural equation model (SEM) and, specifically, the partial least square structural equation modelling for the measurement items. The results show that 30-items of this paper have passed the measurement items test requirement used for structural model testing. The research is expected to extends the knowledge frontier of Goal Setting Theory and gamification items and provides a tool for further investigation for academics and fitness practitioner.

Graph Analytics' Centrality Measurement in Supply Chain

*Mohd Fariduddin Mukhtar[1,2], Zuraida Abal Abas[1], Amir Hamzah Abdul Rasib[2], Siti Haryanti Hairol Anuar[1], Nurul Hafizah Mohd Zaki[1], Zaheera Zainal Abidin[1], Siti Azirah Asmai[1] and Ahmad Fadzli Nizam Abdul Rahman[1]

[1]Faculty of Communication and Information Technology, Universiti Teknikal Malaysia Melaka, 76100 Melaka, Malaysia.
[2]Faculty of Mechanical and Manufacturing Engineering Technology, Universiti Teknikal Malaysia Melaka, 76100 Melaka, Malaysia

Abstract. This paper reviews the importance of graph analytics in the supply chain field from a centrality measurement perspective. In graph analytics, centrality measurement usage is vital to find the most critical nodes in a graph. The centrality helps identify the essential factors that influence suppliers or companies' management for relative measure within a networked economy. Four main issues are affecting the supply chain were addressed based on the three types of supply chain models (Traditional Supply Chain, Modern Supply Chain and e-Supply Chain), which have implemented nowadays. Several centrality measurements were indicated in this paper, referring to the previous studies that had successfully realized the supply chain models applications. The impact of centrality measurements brings a significant improvement in supplier-customer relationship, cost effectiveness, risk management and dynamic and fast-changing time-varying market conditions.

Heart Failure Mortality Prediction Using Machine Learning

*Mohamad Haider Bin Abu Yazid[1], Habibollah Haron[1] , Mohamad Shukor Talib[1] and Muhammad Haikal Satria[2]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, 81300 UTM Johor Bahru, Malaysia
[2]School of Bioscience and Medical Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, 81300 UTM Johor Bahru, Malaysia

Abstract. Patients admitted with heart failure facing a high risk of mortality where 30-day mortality rates are reaching 10%. Identifying patients with high and low risk of mortality could improve clinical outcomes and hospital resource allocation. Existing mortality predictors use statistical and mathematical models that are difficult to obtain where it requires the researcher to understand the relationship between variables that exist in the models. Furthermore, the statistical model consumes a lot of time to build it and it requires experts and requires a lot of effort to build such models. As an alternative approach, machine learning techniques have become very popular to solve problems for forecasting and predictions. This paper proposed the use of machine learning to predict mortality for heart failure patients. Results shows that machine learning techniques able to produce good prediction accuracy. Support Vector Machine produces the best prediction accuracy which test dataset accuracy is at 85% and overall prediction accuracy is at 86.67%.

Identification of Informative Functional Connectivity in Autism Spectrum Disorder Using Penalized Support Vector Machine Cluster

Sin Yee Yap[1], *Weng Howe Chan[1], Hui Wen Nies[1], Azurah A. Samah[1]

[1]Artificial Intelligence and Bioinformatics Group, School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia 81310 Skudai, Johor, Malaysia

Abstract. Resting-state functional connectivity extracted from magnetic resonance images (MRI) is one of the potential biomarkers for psychiatric disorders such as autism spectrum disorder (ASD) owing to its existence of abnormality between diagnosed patient and typical developed (TD) individuals. However, the functional connectivity is often extracted based on huge number of brain regions which makes it high dimensional. In the case of ASD, identification of the informative functional connectivity that relates to the disorder is a crucial task. Support vector machines (SVM) has been widely used in classifying normal and abnormal brain regions. But the use of conventional SVM is not effective enough in identifying informative brain regions. Thus, we used cluster of penalized SVMs to classify between ASD patients and TD individuals. 144 functional MRIs (fMRIs) retrieved from Autism Brain Imaging Data Exchange (ABIDE) that contains 70 ASD samples and 74 TD samples were used. The performance is evaluated in terms of accuracy, sensitivity, and specificity. Comparison is done with results from single SVM. Our method shows better classification accuracy (+25.06%), sensitivity (+28.29%) and specificity (+22.60%). Additionally, the top three selected informative functional connectivity namely superior frontal gyrus with inferior frontal gyrus, precentral gyrus with middle temporal gyrus, and paracentral lobule with postcentral gyrus have been verified with biological knowledge bases and are associated with ASD.

Identification Of Sharp Edge Non-Slender Delta Wing Aerodynamic Coefficient Using Neural Network

*Fahmi Izzuddin Abdul Rahman[1], Nor Haizan Mohamed Radzi[2], Shabudin Mat[1], Mohd Nazri Mohd Nasir[1] and Roselina Sallehuddin[2]

[1]Panel of Aeronautics, Automotive & Ocean Engineering, Universiti Teknologi Malaysia, Johor Bahru, Malaysia
[2]School of Computing, Universiti Teknologi Malaysia, Johor Bahru, Malaysia

Abstract. Delta wing formed a vortical flow on its surface which produced higher lift compared to conventional wing. The vortical flow is complex and non-linear which require more studies to understand its flow physics. However, conventional flow analysis (wind tunnel test and computational flow dynamic) comes with several significant drawbacks. In recent times, application of neural network as alternative to conventional flow analysis has increased. This study is about utilization of Multi-Layer Perceptron (MLP) neural network to predict the coefficient of pressure ($CCpp$) on a delta wing model. The physical model that was used is a sharp edge non-slender delta wing. The training data was taken from wind tunnel tests. The test was done at angle of attack from 0˚-18˚ with increment of 3˚. The flow velocity was set at 25m/s which correspond to 800,000 Reynolds number. The inputs are angle of attack and location of pressure tube (y/cr) while the output is $CCpp$. The MLP models were fitted with 3 different transfer functions (linear, sigmoid, and tanh) and trained with Lavenberg-Marquadt backpropagation algorithm. The results of the models were compared to determine the best performing model. Results show that large amount of data is required to produce accurate prediction model because the model suffer from condition called overfitting.

Implementing Self Organising Map to Organise the Unstructured Data

*S P Lim[1], C K Lee[1], J S Tan[1], S C Lim[2] and C C You[1]

[1] Faculty of Information and Communication Technology, Universiti Tunku Abdul Rahman, Jalan University, Bandar Barat, 31900 Kampar, Perak, Malaysia
[2] Department of Computing and Information Technology, Tunku Abdul Rahman University College, Penang Branch Campus, 77, Lorong Lembah Permai Tiga, 11200 Tanjong Bungah, Pulau Pinang, Malaysia

Abstract. Surface reconstruction is significant in reverse engineering because it should present the correct surface with minimum error using the data available. It has become a challenging process when the data are in the unstructured type and the existing methods are still suffering from accuracy issues. The unstructured data will produce an incorrect surface because there is no connectivity information among the data. So, the unstructured data should undergo the organising process to obtain the correct shape. The Self Organising Map (SOM) has been extensively applied in previous works to solve surface reconstruction problems. However, the performance of the SOM models has remained uncertain. It can be evaluated and tested using different types of data sets. The objectives of this research are to examine the performance and to determine the weaknesses of SOM models. 2D SOM, 3D SOM, and Cube Kohonen (CK) SOM models are investigated and tested using three data sets in this research. As shown in the experimental results, the CKSOM model has proved to perform better because it can represent the correct closed surface with the lowest minimum error.

Integrating A Bayesian Semantic Approach into CBR for Linguistic Pattern reuse in Crime Relation System: Proposed Method

M. Ikhwan Syafiq[1], *M. Shukor Talib[1] and Naomie Salim[1]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, 81310, Johor Bahru, Johor, Malaysia

Abstract. The automatic detection of crime relation entity can help the regulatory authorities to accelerate the crime decision support and information alerts instead of being reliant on manual inspection. This paper aim to propose an effective and generic similarity approach for crime relation extraction systems. For relation extraction purpose, we adopt the case-based reasoning (CBR) approach based on automatically learned linguistic patterns to identify crime relation. CBR approach allowing systems to solve new problems based on solutions of similar past problem. The cases are represented as Linguistic Patterns for crime relation learnt from a set of sentences cointain previously known relations, and then saved in a case base. We propose a semantic Bayesian inference approach to address the semantic uncertainty implied by text in crime domain. The propose method incorporates the adaption of the standard CBR algorithm that is tailored to the classification task. Thus, the goal is to build a classifier which, when given an entity pair, makes a binary decision of whether the entities is pair or not.

Jaya Algorithm for Optimization of Cooling Slope Casting Process Parameters

*Rahaini Mohd Said[1,2], Roselina Sallehuddin[1], Nor Haizan Mohd Radzi[1] and Mohamad Ridzuan Mohamad Kamal[3]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia
[2]Department of Electronic and Computing, Faculty of Electric and Electronic Engineering Technology, Universiti Teknikal Malaysia Melaka.
[3]Department of Manufacturing, Faculty of Mechanical and Manufacturing Engineering Technology, Universiti Teknikal Malaysia Melaka

Abstract. This study proposed the Jaya algorithm to estimate an improved value of billet performance through the cooling casting process. Jaya algorithm is a recent evolution-based algorithm that simulates using stochastic behaviour. The algorithm concept is the solution obtained for a given problem should move towards the best solution and should avoid the worst solution. This algorithm requires only the common control parameters and does not require any algorithm specific control parameters. To the best our knowledge, Jaya algorithm is not yet been used computational approach for optimization practice, particularly in the Cooling casting process. Three Cooling slope parameters process that influences the billet performance measurements, a maximum degree of sphericity and minimum grain size are pouring temperature, slanting angle, and travelling distance. The results show that the Jaya algorithm gave a better optimal solution for the maximum degree of sphericity and minimum particle size than experimental data.

Low-Density Polyethylene (LDPE) Food Packaging Defect Classification using Local Binary Pattern (LBP)

*N Sabri[1], HN Abdull Hamed[1], MA Isa[1], NS Ghazali[2] and Z Ibrahim[3]

[1]School of Computing, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia
[2]Faculty of Computer and Mathematical Sciences, University Teknologi MARA, Kampus Jasin, 77300 Merlimau, Melaka, Malaysia
[3]Faculty of Computer and Mathematical Sciences, University Teknologi MARA, 40450 Shah Alam, Selangor, Malaysia

Abstract. The motivation of this research is to automate the current food packaging inspection process by implementing the non-destructive approach. The current practices require human intervention where human vision tends to overlook the faulty on the package resulting in accuracy dilemma. Human also may be exhausted due to repeated activities. This paper provides the primary phase for effective automation of image classification solution implemented using Weka software. An evaluation of the performance of the Support Vector Machine (SVM), K-nearest Neighbour (KNN) and Random Forest (RF) classification models for Low-Density Polyethylene (LDPE) food packaging defect image classification using a small sample of dataset and Linear Binary Pattern (LBP) as feature extraction algorithm is investigated. Four criteria have been used to evaluate the performance of each classification model which is accuracy, sensitivity, specificity and precision obtained from the confusion matrix table. The results indicate that SVM performs better than RF and KNN with 95% accuracy, 95% sensitivity, 72% specificity and 95% precision in classifying LDPE food packaging defect images.

MEvalS: A Model on Evaluation of Skill-based e-Learning System

*Muneswary Saminathan[1], Norhaida Mohd Suaib[1], Zuriahati Mohd Yunos[1], Nor Anita Fairos Ismail[1] and Aida Ali[1]

[1]School of Computing, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia

Abstract. Skill-based e-learning system is increasingly popular in the TVET education. There is a lack of study on evaluation of skill-based e-learning system. Therefore, the focus of this study is on evaluation of skill-based e-learning system. Various studies have been conducted for the skill training evaluation in terms of effectiveness on the training program or system, however most of the evaluation is focused on industrial training program. This study is focused on available models for skills-based assessment. From this, the closest and most consistent model to the model that can be used for skills-based assessment have been identified. The aim for this research is to propose a model on the evaluation model for skill-based e-learning system called MEvalS. MEvalS is an enhanced evaluation model on skill-based e-learning system adopted from Kirkpatrick model, that transforms existing model into a model that fits in to skill-based e-learning system. The modification was done at the behavioural level in the Kirkpatrick model to suit the assessment on the training skill-based e-learning system more systematically. The research has contributed further to the evaluation on skill-based e-learning system, especially in TVET education field.

Microsleep Accident Prevention for SMART Vehicle via Image Processing Integrated with Artificial Intelligent

S. Zaleha. H[1], *Nur Haliza Abdul Wahab[1], Norafida Ithnin[1], Johana Ahmad[1], Noor Hidayah Zakaria[1] and Chinonso Okereke[1]

[1]School of Computing, Universiti Teknologi Malaysia, 81310 UTM Skudai, Johor, Malaysia

Abstract. Number of accidents caused by microsleep increases rapidly each day. This is due to the current trend of life, for example high workload, long working hours, traffic jams, having too much caffeine, drinking alcohol, age factor, and many others. This microsleep can lead to major accidents, higher number of deaths, injuries, demolition of property and permanent disability. The creation of SMART Vehicles in the Internet of Things (IoT) increases the technology capabilities in transportation sectors, in addition to reduce the number of crashes on the roads. An integration with Artificial Intelligent (AI) can be a perfect combination on development of a microsleep detection and prevention. While the image processing will be used as the method of detecting the face changes from normal to microsleep symptoms on detecting the eye degree, the head motion and the mouth yawning. This work presented a review of current research that supported the integration of IoT and AI. The analysis and discussion on the best solution and method to prevent microsleep accidents was shown. Lastly, recommendation on development of real sensors for SMART Vehicles will be discussed. A preliminary result on this work also will be shown.

Model Development in Predicting Academic Performance of Students Based on Self-efficacy Using k-Means Clustering

Mohammad Zahid Mohammad Sabri[1], *Nazatul Aini Abd Majid[1] and Siti Aishah Hanawi [1]

[1]Faculty of Information Science and Technology, Universiti Kebangsaan Malaysia, Bangi, Selangor, Malaysia

Abstract. Many prediction models have been developed using data mining tools in order to predict the performance of the students at the early stage.The academic performance of higher education students commonly was predicted based on their results in the end of the previous semester or during the semester like test score or mid-term exam. However, there is lack of models that emphasize the use of data related to student's behaviour for predicting the academic performance. Therefore, the aim of this study is to investigate the use of self-efficacy behaviour data to predict the academic performance of students using principal component analysis (PCA) and k-means clustering (KMC). This study focuses on the first part of the prediction which is model development. In the model development phase, the number of variables were reduced from 20 into two by using PCA. The scores for the first two principal components were clustered by using KMC. The results show that the scores can be clustered into three main clusters to differentiate the student's self-efficacy behaviour. Next research will investigate the underlying causes of the clusters in order to predict the risky students.

Modelling of Flexible Manipulator System via Ant Colony Optimization for Endpoint Acceleration

S S Z Nazri[1], *M S Hadi[1], H M Yatim[2], M H Ab. Talib[2] and I Z M Darus[2]

[1]Faculty of Mechanical Engineering, Universiti Teknologi MARA, 40450, Selangor, Malaysia
[2]School of Mechanical Engineering, Universiti Teknologi Malaysia, 81310, Johor, Malaysia

Abstract. The application of flexible manipulators has increased in recent years especially in the fourth industrial revolution. It plays a significant role in a diverse range of fields, such as construction automation, environmental applications, space engineering and many more. Due to the lightweight, lower inertia and high flexibility of flexible manipulators, undesired vibration may occur and affect the precision of operation. Therefore, development of an accurate model of the flexible manipulator was presented prior to establishing active vibration control to suppress the vibration and increase efficiency of the system. In this study, flexible manipulator system was modelled using the input and output experimental data of the endpoint acceleration. The model was developed by utilizing intelligence algorithm via ant colony optimization (ACO), commonly known as a population-based trail-following behaviour of real ants based on auto-regressive with exogenous (ARX) model structure. The performance of the algorithm was validated based on three robustness methods known as lowest mean square error (MSE), correlation test within 95% confidence level and pole zero stability. The simulation results indicated that ACO accomplished superior performance by achieving lowest MSE of 2.5171×10^{-7} for endpoint acceleration. In addition, ACO portrayed correlation tests within 95% confidence level and great pole-zero stability.

Optimizing the Operation Management for the Business Process Port Terminal Information System Using Web-Based Application

*Azurah A Samah[1],Nurul Najihah Zanudin[1], Hairudin Abdul Majid[1], Yusliza Yusof[1], Lizawati Mi Yusof[1] and Dewi Nasien[2]

[1]School of Computing, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 Johor Bahru, Johor, Malaysia
[2]Institut Bisnis dan Teknologi Pelita Indonesia, Pekanbaru, Riau, Indonesia

Abstract. Information and communication technology (ICT) have offered various platforms and tools for organization to promote business information and services to the global market. Port Terminal is known as the largest and biggest place for the logistic and transportation industry. It provides services such as shipping and marine request and required a powerful technology to support 24-hours services for the user. This research was conducted to revamp the existing system for Johor Port Berhad and named it as Port Terminal Information System (PTIS) by using a latest and powerful technology such as JAVA. PTIS requires strategic application system that consolidated all transactions from different departments such as Vessel Clearance, Marine Services, Multi-Purpose Terminal, Johor Port Container Terminal and Free Zone department and aimed to simplify the business process. This research gathered requirements from stakeholder and proposed to automate the manual process such as user registration and termination process. This research implemented The Rational Unified Process (RUP) of Agile Methodology to develop PTIS. This research implemented User Acceptance Testing (UAT) with stakeholders to detect if there is any error and to check if the system meets user's expectation. During this activity, unexpected technical error was occurred, but it was changed accordingly. Testing activity have been recorded in Software Testing Documentation (STD).

Parameter Design for Group Method Data handling (GMD) using Taguchi in Software Effort Estimation

*Siti Hajar Arbain[1], Mustaffa N.H[1], Ali N.A.[1] and Jawawi D.N.A[1]

[1]School of Computing, Universiti Teknologi Malaysia (UTM), 81310 Johor Bahru, Johor, Malaysia

Abstract. Recently, the application of data-driven models is becoming increasingly popular due to less development but have proven to give accurate prediction with less knowledge of the behavior and criteria of the geological, hydrological, and physical process. One of the popular data driven and sub-model of neural network is a Group Method of Data Handling (GMDH). It was first developed for modeling and identification algorithm for complex systems. The GMDH model is known as a self-organizing heuristic modeling approach. It is very effective for solving modeling problems involving multiple input to single output data. Although GMDH model have been applied in many fields of modeling, it has been given a little attention for some modifications in term of parameters design. In other ways, Dr Genichi Taguchi proposed taguchi method for improving the process or product design with the aid of levels of significant parameters that effect the delivery of the product. In this paper, we evaluated the performance of numbers of neurons per layer, hidden layer, alphas, and train ratios parameters using Taguchi design for parameter setting in GMDH. Two data from software effort estimation which is Cocomo and Kemerer are used in this paper to perform an evaluation of our hypothesised scenarios. The results shows that number of neurons, layer and train ratio are the most significant parameter that affect the performance of GMDH model. This breakthrough is expected to lead towards the development of Taguchi-GMDH model..

Performance Evaluation of Radial Basis Function (RBF) and Multilayer Perceptron (MLP) in Identifying the Contributory Factors of Learning Habits during COVID-19

*Nur Nabilah Abu Mangshor[1], Shafaf Ibrahim[1], Nurbaity Sabri[1], Hazwa Hanim Mohamed Hamzah[1] and Saadi Ahmad Kamaruddin[2]

[1]Centre of Vision, Algorithm, and Analytics (C-VAA), Faculty of Computer and Mathematical Sciences, Universiti Teknologi MARA Cawangan Melaka, Jasin Campus, 77300 Merlimau, Melaka, Malaysia
[2]School of Quantitative Scinces, College of Arts & Sciences, Northen University of Malaysia, 06100 UUM Sintok, Kedah, Malaysia

Abstract. The Coronavirus Disease 2019 (or known as COVID-19) outbreak has affected a lot of people worldwide and resulted in the practice of new norms in most daily activities. One of the practices that is closely associated with the new norm is online learning which has also become a necessity and essential especially in the education sector. This has led to the need to investigate the contributory factors of students' learning habits as students' learning habits correlate with students' performance. A dataset from Vietnamese students' learning habits during the COVID-19 pandemic is used where the performance of the Radial Basis Function (RBF) network and Multilayer Perceptron (MLP) network are compared. There are fifteen covariates used in this study which are *fa_job, exam, Self_evaluation, English, Lh_before_Cov, nec_prog, nec_habit, nec_parent, eff_moti, eff_con eff_supp, eff_env, eff_obj, eff_resource,* and *eff_friend*. Based on the comparison performed, it is concluded that both RBF and MLP networks are capable in identifying the contributory factors of students' learning habits during the COVID-19 pandemic. It is monitored that the MLP network outperforms the RBF network with the lower Sum of Squares Error (SSE) and Relative Error (RE) values. Additionally, it is also observed that the learning hours before COVID-19 (*Lh_before_Cov)* is identified as the most contributing factor in students' learning habits.

Response Surface Analysis of DIB Nozzle Geometry on Acoustic Power Level using Central Composite Design of Experiment

*Mohamad Nur Hidayat Mat[1], Md Faisal Md Basir[2] and Nor Zelawati Asmuin[3]

[1]School of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia
[2]Department of Mathematical Sciences, Faculty of Science, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia
[3]Department of Energy and Thermodynamic Engineering, Faculty of Mechanical and Manufacturing Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Johor, Malaysia

Abstract. The critical process parameters in manufacturing dry ice blasting nozzle geometry directly related to particle jet velocity. Many studies focused on its performance without considering the noise emission due to high operating pressure. This paper, a numerical simulation study was performed using Ansys Fluent to investigate the effect of nozzle geometry of single-hose dry ice blasting on the acoustic power level. The process of modelling the two-way mass momentum and energy exchange between two phases was successfully solved iteratively in the two-way mass momentum model and the energy exchange between the two phases. It was found that the value of noise emission reaches a maximum level when the shortest convergent angle of 20^{o} with a minimal convergent length of 50 mm and a maximum length of 300 mm is introduced. Besides, the peak value of acoustic power level swell up to 146 dB occurs at a nozzle area ratio of 20 without influencing by convergent angle and extending the divergent length highly influencing noise reduction as less than 143.5 dB for a divergent length of 700 mm.

Review on Resilient Supplier Selection

*Wan Yee Leong[1] and Kuan Yew Wong[1]

[1]School of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia

Abstract. Recently, many industries undergo supply chain disruptions due to the lack of consideration on resilience during supplier selection. As consequences, supply chains fail to adapt to the risks and recover from the damage within a short period. The literature on resilient supplier selection shows that there is no review paper discussing on resilience criteria and resilient supplier selection methods in the past decade. The objective of this paper is to provide a review on resilience criteria and resilient supplier selection methods. To achieve the objective, previous papers related to resilience were studied and analyzed. Then, a summary on resilient criteria and resilient suppler selection methods was presented clearly in the paper as a reference for future research. Furthermore, other suitable methods were also proposed for resilient supplier selection.

Smart Irrigation System for Urban Gardening Using Logistic Regression Algorithm and Raspberry Pi

*R. Aminuddin[1], A. S. Sahrom[1] and M. H. A. Halim[2]

[1]Faculty of Computer and Mathematical Sciences, MARA University of Technology Malacca Branch (Jasin Campus), 77300 Merlimau, Malacca, Malaysia
[2]JHill Agro Dagang (JIHAD), Jalan Teman Indah Utama, 77000, Jasin, Malacca, Malaysia

Abstract. People have shown an increasing interest in urban gardening. Irrigation is one of the common methods used to take care of the plant growth. However, the proper irrigation timing of plant is much unclear for most people. Moreover, the manual irrigation is impossible when people do not have physical access to the plant in a long period of time. Hence, a smart irrigation system using Raspberry Pi has been proposed to ease the irrigation. In this system, three different sensors, including moisture, humidity and temperature sensors are installed in the soil of the plant. The collected data from the sensors will be used to predict whether the plant need to be watered or not. This system implements a machine-learning algorithm called Binary Logistic Regression using Python library to test the accuracy of the system. The accuracy of the algorithm to predict the irrigation is 82%. The finding from this study is believed to be helpful as it may contribute to the development of better irrigation system.

Teachers' Perception On Using Cloud Based Technology And Augmented Reality In Higher Education

*Nazatul Aini Abd Majid[1], Hazura Mohamed[1] and Dian Indrayani Jambari[1]

[1]Faculty of Information Science and Technology (FTSM), Universiti Kebangsaan Malaysia, 43600 UKM Bangi, Selangor, Malaysia

Abstract. Learning improvement can be achieved when the content of a course is delivered based on a suitable approach supported by the integration of technology. This integration is based on the Technological Pedagogical Content Knowledge (TPACK) model, but lack of training that emphasizes the use of technology in the current context can lead to unwillingness of educators in integrating technology into their teaching plan. Therefore, a training module based on the experiential learning model for integrating advanced technology in education, like cloud based tools and augmented reality is needed for educators in higher education. As such, in line with Kolb's experiential learning theory, the current study develops an educational technology and augmented reality learning module, to be conducted for educators in higher education institution. In a case study conducted in a classroom, 15 educators participated in the learning activity using formative assessment approach and cloud based tools, which includes educational technology (EdPuzzle, Nearpod, Socrative, Formative, Kahoot, andQuizziz) as well as augmented reality (HP Reveal). The results from the case study indicated that, the module successfully received positive responds for engagement, interaction, competency and interest. The module also improved knowledge and skills among participating educators. Hence, the use of cloud based tools for advanced educational technology in learning module based on experiential learning theory increases educators' readiness and perception towards integrating technology in their teaching plan. This can support the aim to promote active learning in higher education for increased interest and positive attitudes towards learning in both students and educators.

The Effectiveness of Computer Assisted Learning Platforms on Students' Learning: Amid Covid-19 Pandemic

*Noor Hasimah Ibrahim Teo[1], Nor Azida Muhammed Noor[1] and Nor Aiza Moketar[1]

[1]Department of Computer and Mathematical Science, Universiti Teknologi MARA, 77300, Melaka, Malaysia

Abstract. This study is a depiction of computer assisted learning platforms adopted by Universiti Teknologi MARA for the teaching and learning process during the outbreak of novel coronavirus disease beginning the year 2020. The intended purpose of this paper seeks to address the effect of different computer assisted platforms on students' performance, and particularly exploring which of the platforms would give a better learning experience to students in terms of student's ability to perform in assessment amid the Covid-19 pandemic. The study was carried out to explore four medium of learning platforms: micro-teaching through Telegram, online meeting through Google meet, reading slide presentation, and recorded narrative video presentation. The paper employs a quantitative approach to study the effect of different online learning platforms on students' performance and highlighted the assessment process's implementation during the lockdown period. The contribution of this paper is to draw a picture of computer assisted learning approaches during the Covid-19 pandemic and which learning platform is better for teaching and learning, and how it has a different effect on students' performance. Results obtained from a survey of four groups of students learning Discrete Structure subject shows that teaching and learning on different platforms significantly affect students' score and narrative recorded video is recorded as better than other learning platforms.

The Role of Graph Analytics in Performance Measure for Supply Chain Network

*Nurul Hafizah Mohd Zaki[1], Zuraida Abal Abas[1], Siti Azirah Asmai[1], Norhazwani Md Yunos[1], Zaheera Zainal Abidin[1], Ahmad Fadzli Nizam Abdul Rahman[1], Mohd Fariduddin Mukhtar[1] Siti Haryanti Hairol Anuar[1] and Nurul Akmal Hashim[1]

[1]FTMK, Universiti Teknikal Malaysia Melaka 76100 Melaka, Malaysia

Abstract. Today, the complex supply chain network is a tedious way to manage and demand performance measurement due to business growth and involved intricate process. This study focused on suppliers since they are the vital entity for the company execution the business in the supply chain. Traditionally, the tabular data technique acts as an important approach for measuring supplier performance. However, the current technique on calculating the performance measure is by using typical percentage formula and the result is populated on the tabular data. As a result, the decision-maker faced difficulty in making the selection of the best supplier and monitor their performance based on the tabular data. In fact, it takes a longer time to obtain the decision. Therefore, graph analytics is proposed to replace the tabular data technique for performance measures. The graph analytics is used to improve the existing technique by visualizing the relationship of the supplier's delivery timing of plan and actual time. The significance of the performance measures produces an easier approach to monitoring the current performance of suppliers.

Towards Sustainable Consumer Mhealth Apps Adoption: Perceived Risks Versus Organizational Facilitators Review

*Rasha Aljabali[1] and Norasnita Ahmad[1]

[1]Azman Hashim International Business School, Universiti Teknologi Malaysia, Johor, Malaysia

Abstract. Mobile Health (Mhealth) apps services for health behavior rehabilitation have become a demand in healthcare and medical segments. However, Mhealth apps' poor adoption and high rate of discontinuation may occur due to risk perception of those apps. This review paper introduced perceived risks of Mhealth apps and proposed the role of the organizational facilitators that could tackle or reduce the impact of risk perception among consumers while using Mhealth apps. The review paper used a literature review from 4 databases and included 16 articles to analyse diverse risks types that may consumers perceived in the initial utilization stage for Mhealth apps. Despite few studies have deliberated the organizational facilitators (Endorsement, Awareness, loyalty, cost, facilitating condition, regulation, and data protection), there is a need to explore those facilitators in different Mhealth apps and population composition.

TSP Solving Utilizing Improved Ant Colony Algorithm

Xuan-Shi Yao[1], *Yun Ou[1] and Kai-Qing Zhou[1]

[1]College of Information Science and Engineering, Jishou University, Jishou, 41600, Hunan, China

Abstract. To solve the premature issue of TSP solving using the ant colony optimization algorithm (ACO） , this paper proposes an improved ACO using particle swarm optimization (PSO) to solve the classic traveling salesman problem (TSP). The algorithm's strategy includes three stages: firstly, establishing a mathematical model according to the optimization objective, and then solving the optimal path obtained by the particle swarm optimization algorithm. Finally, the pheromone concentration of this path in the ant colony mathematical model is enhanced according to the particle swarm optimization algorithm's optimal path. A classic TSP case is used to compare the PSO and ACO. The results show that the proposed improved algorithm has a faster convergence speed and can converge to the optimal global solution, and its performance is better than that of ACO and PSO.

Velocity Flow Field Characteristic on Nozzle Cavity using Central Composite Design of Computational Method for Dry Ice Blasting System

*Mohamad Nur Hidayat Mat[1], Md Faisal Md Basir[2] and Mohamad Farid Sies[3]

[1]School of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia
[2]Department of Mathematical Sciences, Faculty of Science, Universiti Teknologi Malaysia, 81310 UTM Johor Bahru, Malaysia
[3]Department of Mechanical and Manufacturing, Department of Mechanical Engineering, Universiti Tun Hussein Onn Malaysia, 86400 Parit Raja, Johor, Malaysia

Abstract. In the development of dry ice blasting nozzle geometry, the critical process parameters depend on particle jet velocity. However, very few researchers have attempted sensitivity on the velocity flow area of specific nozzle geometric parameters. A numerical simulation approach was performed in this paper using Ansys Fluent to investigate different nozzle parameters on the velocity flow field. A two-dimensional model is solved iteratively using averaged Navier-Stokes under Eulerian flow description. It was found that the velocity value increases that reach 550 m/s with an increment of the nozzle area ratio of up to 20 without influencing convergent angle and the velocity magnitude drop linearly from 525 m/s to 505 m/s in with the rise of divergent length that swell up to 700 mm and with constant convergent angle and convergent length.

Vibration Control of Semi-Active Suspension System using Modified Skyhook with Advanced Firefly Algorithm

*M H Ab Talib[1], I Z Mat Darus[1], H M Yatim[1], M S Hadi[2], N M R Shaharuddin[1], I I Mazali[1] and M I Ardani[1]

[1]School of Mechanical Engineering, Faculty of Engineering, Universiti Teknologi Malaysia, 81310 Johor Bahru, Johor, Malaysia
[2]Faculty of Mechanical Engineering, Universiti Teknoogi MARA, 40450, Selangor, Malaysia

Abstract. The semi-active suspension (SAS) system is a partial suspension device used in the vehicle system to improve the ride comfort and road handling. Due to the high non-linearity of the road profile disturbances plus uncertainties derived from vehicle dynamics, a conventional Skyhook controller is not deemed enough for the vehicle system to improve the performance. A major problem of the implementation of the controller is to optimize a proper parameter as this is an important element in demanding a good controller response. An advanced Firefly Algorithm (AFA) integrated with the modified skyhook (MSky) is proposed to enhance the robustness of the system and thus able to improve the vehicle ride comfort. In this paper, the controller scheme to be known as MSky-AFA was validated via MATLAB simulation environment. A different optimizer based on the original firefly algorithm (FA) is also studied in order to compute the parameter of the MSky controller. This control scheme to be known as MSky-FA was evaluated and compared to the proposed MSky-AFA as well as the passive suspension control. The results clearly exhibit more superior and better response of the MSky-AFA in reducing the body acceleration and displacement amplitude in comparison to the MSky-FA and passive counterparts for a sinusoidal road profile condition.

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