



IIUM ENGINEERING CONGRESS 2019

INNOVATION FOR SUSTAINABLE DEVELOPMENT

30 - 31 OCTOBER 2019

PUTRAJAYA INTERNATIONAL CONVENTION CENTRE

ICOM'19

7th IEEE INTERNATIONAL
CONFERENCE ON
MECHATRONICS
ENGINEERING
2019

ICMAE'19

5th INTERNATIONAL
CONFERENCE ON
MATHEMATICAL
APPLICATIONS IN
ENGINEERING
2019

ICAMME'19

4th INTERNATIONAL
CONFERENCE ON
ADVANCES IN
MANUFACTURING AND
MATERIALS
ENGINEERING 2019

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MESSAGE FROM THE PRESIDENT



YBhg. Datuk Dr. Mohd Daud Bakar
President
International Islamic University Malaysia

In the name of Allah, the Most Gracious, the Most Merciful

Assalamu'alaikum Warahmatullahi Wabarakatuh

I wish to welcome all participants to the IIUM Engineering Congress 2019. This event marks the consistent and persistent effort of Kulliyah of Engineering to become **A Global Centre of Innovative Engineering Education and Research with Values and Professional Ethics**. Since its establishment in 1994, the Kulliyah strives to provide quality engineering education and engage in state-of-the-art research initiatives.

IIUM aims to become a leading international centre of educational excellence which seeks to restore and regain the dynamic and progressive role of the Muslim Ummah in all branches of knowledge and intellectual discourse. I aspire the Kulliyah to take a leading role in producing not only technically competent engineers and technologists, but with exemplary leadership. Only then will they become the effective future agent of change for the betterment of humanity.

IIUM Engineering Congress 2019 witnesses a collection of more than 200 technical papers with the participation of international scholars from 15 countries. I wish your participation in the congress would be fruitful and serves as a platform to foster collaborative work in the near future.

Wassalam.

Datuk Dr. Mohd Daud Bakar
President of International Islamic University Malaysia

MESSAGE FROM THE RECTOR



Professor Emeritus Tan Sri Dato Dzul kifli Abdul Razak
Rector
International Islamic University Malaysia

Assalamu'alaikum Warahmatullahi Wabarakatuh

Nations across the globe are building momentum towards the implementation of Sustainable Development Goals (SDGs) agreed by the United Nations in September 2015. The agenda comprises 17 goals and 169 targets. SDGs framework aims for balance of economic progress and protection of environment, and at the same time address the disparity between rich and developing countries. In a nutshell, the message is **WE CARE**.

IUM as a tertiary education institution imbued with Islamic values and ethics must set a leading example in advocating SDGs as they are essentially elements of teachings in Islam. It is thus highly and timely the Engineering Congress 2019 spreads the message of **WE CARE** to the meetings of engineers and scientists, which are in fact vital stakeholders towards the success of SDG agenda.

Our effort might be humble but the message inherent in it is invaluable. May Allah accept our humble contribution. On this occasion, I congratulate the Kulliyah of Engineering and wish all delegates a fruitful discussions and knowledge sharing. May Allah *SWT* bless us all.

Wassalam

Dzul kifli Abdul Razak, Prof. Emeritus Tan Sri Dato'
Rector
International Islamic University Malaysia

MESSAGE FROM THE CONGRESS CHAIRMAN



Professor Dr. Ahmad Faris Ismail
Dean
Kulliyah of Engineering

*Bismillahirrahmanirrahim
Assalamualaikum warahmatullahi wabarakatuh*

It is my utmost pleasure to welcome all participants to the IIUM Engineering Congress 2019. This year event comprises *the 7th IEEE International Conference on Mechatronics Engineering, the 5th International Conference on Mathematical Applications in Engineering and the 4th International Conference on Advances in Manufacturing and Materials Engineering*. The participants will have the privilege to gather and exchange knowledge, and establish networking across various disciplines in a single platform.

This year marks the 25th anniversary of the Kulliyah of Engineering that has a mission to become a referral hub for engineering education and sustainable solutions based on Islamic principles for a better world. We are proud to have good expertise in many engineering areas and look forward to establish meaningful collaborations for mutual benefits.

I would like to take this opportunity to express my heartfelt appreciation to all parties who have directly and indirectly contributed towards the success of this auspicious event, especially the committed and passionate committee members. May Allah SWT reward you greatly for your good efforts.

Thank you very much for your participation and we hope to welcome you again in IIUM Engineering Congress 2020.

Professor Dr. Ahmad Faris Ismail
Chairman
IIUM Engineering Congress 2019

CONGRESS ORGANIZING COMMITTEES

Chairman	Prof. Dr. Ahmad Faris Ismail
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WELCOMING SESSION



Welcoming Session

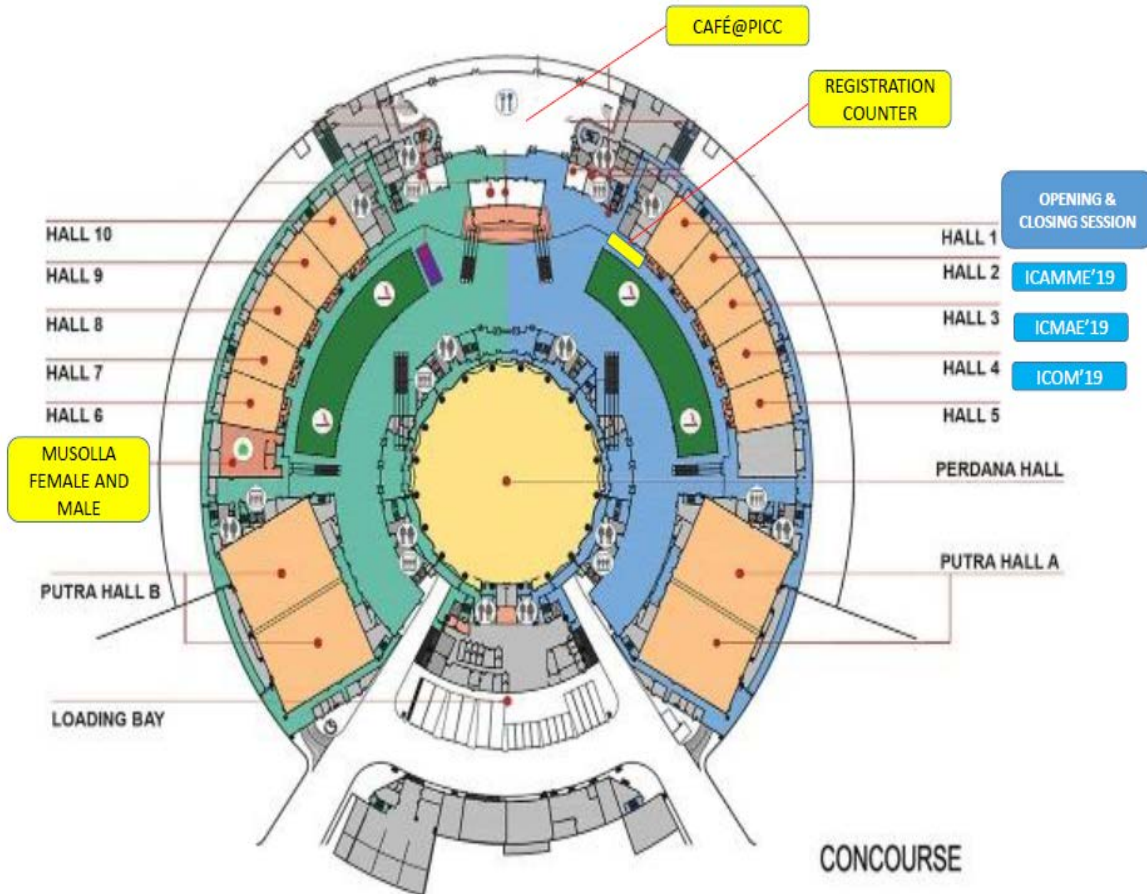
Date: 30 October 2019 / Wednesday

Venue : Hall 1, Putrajaya International Convention Centre (PICC),
Putrajaya, Malaysia

10:45 am	:	Arrival of guests
10:50 am	:	National Anthem <i>Negaraku</i> and IIUM song
10:55 pm	:	Recitation of Duá
11:00 am	:	Welcoming Address by Dr. Syamsul Bahrin Abdul Hamid Chairman of ICOM'19
11:05 am	:	Welcoming Address by Dr. Mohd Lukman Inche Ibrahim , Chairman of ICMAE'19
11:10 am	:	Welcoming Address by Assoc. Prof. Dr. Mohamed Abd. Rahman , Chairman of ICAMME'19
11:15 am	:	Welcoming Address by Prof. Dr. Ahmad Faris Ismail , Chairman of IIUM Engineering Congress 2019
11.25 am	:	Souvenir presentation



Putrajaya International Convention Centre (PICC) (LAYOUT PLAN MEETING AND EVENTS)



Codes:

Hall 4	ICOM'19
Hall 3	ICMAE'19
Hall 2	ICAMME'19

IEC'19 PROGRAMME

Day 1: Wednesday 30 th October 2019			
08.00 - 09.00	Registration		Venue: Foyer (Hall 1)
9.00 - 9.45	Keynote Speech #1 Title: Novel Revolutionary Materials and Devices for Solar Energy: Hybrid Perovskites Name: Prof. Dr. Anvar A. Zakhidov, Physics Department & Nanotech Institute The University of Texas at Dallas Venue: Hall 1 Chairperson: Dr. Mohd Lukman Inche Ibrahim		
9.45 - 10.30	Keynote Speech #2 Title: Novel Ion-Conductive Polycarbonate-based Electrolytes for Battery Applications Name: Professor Dr. Yoichi Tominaga, Tokyo University of Agriculture and Technology (TUAT) Venue: Hall 1 Chairperson: Prof. Dr. Iskandar Idris Yaacob		
10.30 - 10.45	Refreshment		Venue: Foyer (Hall 2, 3, 4)
10.45 - 11.30	Welcoming Session Venue: Hall 1		
11.30 - 12.15	Keynote Speech #3 Title: Image Analysis Using Persistent Homology Name: Prof. Dr. Mohd. Salmi Md. Noorani, School of Mathematical Sciences Universiti Kebangsaan Malaysia Venue: Hall 1 Chairperson: Assoc. Prof. Dr. Raihan Othman		
12.15-13.00	Keynote Speech #4 Title: Triggering Physiological Micro/Nano Mechatronics for Respiratory Treatments Name: Professor Dr. Ahmed Al-Jumaily, Biomechanical Engineering, The Auckland University of Technology, Auckland, New Zealand Venue: Hall 1 Chairperson: Prof. Dr. Md. Raisuddin Khan		
13.00 - 14.00	Lunch		Venue: Pot & Pan Restaurant
14.00-16.30	Parallel Sessions		
	ICOM'19 (Hall 4A)	ICOM'19 (Hall 4B)	ICOM'19 (Hall 4C)
	ICMAE'19 (Hall 3A)	ICMAE'19 (Hall 3B)	ICMAE'19 (Hall 3C)
	ICAMME'19 (Hall 2A)	ICAMME'19 (Hall 2B)	ICAMME'19 (Hall 2C)
16.30-17.00	Refreshment:		Foyer (Hall 2, 3, 4)
Day 2: Thursday 31 st October 2019			
9.00-9.50	Keynote Sessions		
	ICOM'19 Keynote Speech 5 Venue: Hall 4	ICMAE'19 Keynote Speech 6 Venue: Hall 3	ICAMME'19 Keynote Speech 7 Venue: Hall 2
9.50- 10.20	Refreshment		Venue: Foyer (Hall 2, 3, 4)
10.20 -13.00	Parallel Sessions		
	ICOM'19 (Hall 4A)	ICOM'19 (Hall 4B)	ICOM'19 (Hall 4C)
	ICMAE'19 (Hall 3A)	ICMAE'19 (Hall 3B)	ICMAE'19 (Hall 3C)
	ICAMME'19 (Hall 2A)	ICAMME'19 (Hall 2B)	ICAMME'19 (Hall 2C)
13.00-14.00	Lunch		Venue: Pot & Pan Restaurant
14.00-15.40	Parallel Sessions		
	ICOM'19 (Hall 4A)	ICOM'19 (Hall 4B)	ICOM'19 (Hall 4C)
	ICAMME'19 (Hall 2A)	ICAMME'19 (Hall 2B)	ICAMME'19 (Hall 2C)
15.40-16.00	Closing session and Best papers Awards		Venue: Hall 1
16.00-16.30	Refreshment		Venue: Foyer (Hall 2, 3, 4)



Prof. Dr. Anvar A. Zakhidov
Physics Department & Nanotech Institute
The University of Texas at Dallas

Prof. Anvar A. ZAKHIDOV is Deputy Director of UTD-NanoTech Institute, Full Professor of Physics, Affiliated Professor of Materials Science and Adjunct Professor of Chemistry at the University of Texas at Dallas. Earlier Zakhidov was working as Senior Research Scientist of Honeywell (former Allied Signal Inc.). He got his Ph.D. degree in Optics in Moscow in 1981 and since that time, was actively involved in scientific research in various places, including Nuclear Institute of Uzbekistan Academy of Sciences, (1983-1988), Japan, Italy, Russia. He has received many awards including: Asian-American Engineer of the Year 2003 from CIE/USA, Nano 50 Award from Nanotech Briefs Magazine (2006), the NanoVic Prize from Australia (2006), Kapitza Golden Medal (2007) and Elsevier Scopus Award 2018 as the most highly cited Russian scientist in the fastest developing area of perovskite PV. Zakhidov is APS (American Physical Society) Fellow, Academician of RAEN (Russian Academy of Natural Sciences), foreign academician of KazNAEN: Kazakhstan Academy of Natural Sciences. He is serving as a US Managing Editor of International Journal of Nanoscience (IJN) and has more than 380 published papers, cited more than 30440 times with Hirsh index of $h=62$, and he owns 18 USA patents.

NOVEL REVOLUTIONARY MATERIALS AND DEVICES FOR SOLAR ENERGY: HYBRID PEROVSKITES

Energy is No.1 in the List of 10 top problems of humanity in next 50 years! In this talk, I show that Earth will run soon out of all existing sources of Energy: oil, gas, coal. Only Sun keeps providing endless amount of energy to the Earth every second. The amazing new material has changed the landscape of solar photovoltaics: **Organohalide lead perovskites** have revolutionized the emerging solar cell technology landscape. Lab scale PSC efficiency have reached 24 % (higher than sc-Si-PV) and recently demonstrated the *highest power-to-weight ratio*² (10 kW/lbs) among existing PV cells.

In simple terms, understandable to scientists in general, I will explain how this new Perovskite Solar cells operate, and why they are creating such an excitement.

Since the late 1990s, the market for solar energy has grown at an *annual rate of 20%*. The solar industry growth rates estimated above 25% annually, resulting in a *\$27-billion market by 2020*. With technological innovations, such as perovskites, solar energy can become a major high-tech growth industry. In the last 25 years, the cost of solar cells has come down significantly, and the industry has grown at annualized rates of 15% to 20% – a growth rate comparable to that of semiconductor and computer industries.



Prof. Dr Yoichi Tominaga

Tokyo University of Agriculture and Technology, Japan

Dr. Yoichi Tominaga is a Professor at Tokyo University of Agriculture and Technology (TUAT). He was a PhD graduate from Professor Hiroyuki Ohno group in 2000. After graduation, he took up an academic position at Tokyo Institute of Technology in 2000, worked as an Assistant Professor by 2007 and was appointed Lecturer of TUAT in 2007. During the assistant in 2003-2004, he worked with Professor Bruno Scrosati at Rome University as a Research Fellow of Ministry of Education, Culture, Sports, Science and Technology of Japan. He was awarded a SPSJ Hitachi Chemical Award from the Society of Polymer Science, Japan in 2015 to extend his work on polymer electrolytes. His research interests include polymeric and composite materials for batteries, biomass, smart and intelligent devices and medical applications. He has prepared and tested a lithium- ion cell using new polymer electrolytes working at room temperature to develop flexible solid batteries.

NOVEL ION-CONDUCTIVE POLYCARBONATE-BASED ELECTROLYTES FOR BATTERY APPLICATIONS

Ion-conductive solid polymer electrolytes (SPE) are promising materials for energy storage devices, such as lithium rechargeable batteries, because they potentially have high safety and high manufacturing workability. Most studies on SPE have focused on the use of polyethers, such as poly (ethylene oxide) (PEO), however, studies have shown that there is an apparent limitation of the polyether-based electrolytes. In the present study, we considered the ion-conductive and electrochemical properties of SPEs consisting of polycarbonates such as poly (ethylene carbonate) (PEC) with Li salt. Previous studies have shown that certain PEC-based electrolytes exhibit a continuous increase in ionic conductivity with increasing salt concentration, and have very high lithium transference numbers. We revealed that highly aggregated coordination structure between carbonate groups and Li ions and anions based on the relatively rigid structure gives rise to the unusual characteristics, by means of spectroscopic studies. Furthermore, the study demonstrated possibility to take advantage of a high oxidation stability and a prevention effect of metal corrosion reaction, which are based on the highly salt-concentrated nature of the electrolytes. The favorable electrochemical properties potentially enable operation of lithium polymer batteries which need to be charged above 4 V. Moreover, we recently focus on the chemical structure of polymer framework for the development of ion-conductive properties of SPE. Copolymerization of carbonate and ether units was carried out for obtaining homogeneous electrolytes without phase separation showing excellent Li ion-conductive properties. The random copolymers of ethylene oxide with CO₂ (poly (ethylene carbonate/ethylene oxide), P(EC/EO)) containing lithium salt exhibited ionic conductivities and Li transference numbers (t_+) higher than 0.4 mS cm⁻¹ and 0.6 at 60 °C.



Prof. Dr. Mohd. Salmi Md. Noorani

Department of Mathematical Sciences
Universiti Kebangsaan Malaysia

Mohd Salmi Md Noorani is a Professor of Mathematics at Universiti Kebangsaan Malaysia. He did his undergraduate and postgraduate degrees all at the University of Warwick, UK.

His research interest is in the areas of dynamical systems, topology, fixed point theory and synchronization. He likes venturing into new things and presently he is heading a research group in the area of persistent homology which looks at ideas of topology and algebraic topology in the analysis of data.

IMAGE ANALYSIS USING PERSISTENT HOMOLOGY

An image illustrates meaningful information of a structure, process or system yet conceal a lot more vital details that are difficult to extract computationally. Apart from Minkowski functionals and Fourier analysis, a component of topological data analysis, called persistent homology is persuasive to be an alternative tool to study morphology of an image. By using topological concept, persistent homology extracts qualitative features (e.g. connected components, holes and voids) that are embedded within input data. With regard to this tool, besides that it is robust to noise, persistent homology provides clear distinction between images though there exist only slight difference of structure. By referring to k -dimensional features, persistent homology can also be used to search for critical value of relevant parameters. In addition, multiple implementations have been performed to study the dynamics of topological features involving spatiotemporal systems. As for classification or clustering purpose, this tool happens to improve accuracy of analysis when it is hybrid with machine learning method. Here, simulated digital images of Turing patterns are characterized by using quantified topological features. Moreover, the images are classified into stable parameter range using hybrid persistent homology and machine learning techniques.



Professor Ahmed Al-Jumaily

Biomechanical Engineering
The Auckland University of Technology, Auckland, New Zealand

Dr. Ahmed M. Al-Jumaily, is currently a Professor of Biomechanical Engineering and the Founder and Director of the Institute of Biomedical Technologies at the Auckland University of Technology, Auckland, New Zealand. He holds a PhD and M.Sc. from the Ohio State University, USA and a B.Sc. from the University of Baghdad. He is a FELLOW member of the American Society of Mechanical Engineering (ASME) and the Acoustical Society of America; in addition, a member of 11 more international professional societies. He is the Editor of the ASME Journal of Engineering and Science in Medical Diagnostics and Therapy, the Editor for the ASME monograph series-Biomedical and Nanomedical Technologies and has been on the editorial and refereeing boards for several international journals. He has published more than 340 papers in international journals and conference proceedings including two ASME books on Vibration and Acoustics in Biomedical Applications and a third one on CPAP devices. He has supervised more than 90 postgraduate students from 34 countries in biomedical applications, vibrations, biomechanics, and electroactive polymers. During his academic career, he has forged strong alliances between academia and industries; in particular, in the medical devices area, which has resulted in many successful grants and contracts with companies and research organizations. Al-Jumaily's current research focuses on biomedical applications, particular interest in the application of vibration and acoustics to airways constriction therapies and artery non-invasive diagnostics.

TRIGGERING PHYSIOLOGICAL MICRO/NANO MECHATRONICS FOR RESPIRATORY TREATMENTS

Micro and nanomechatronics in physiology include basic manmade applications in robotics, sensors, actuators, semiconductor materials and devices for various health diagnostics, treatments and therapy. However, since the first creation, such natural physiological systems have been the main constituents of driving various activities within living-being bodies. One of these nanomechatronics systems is the airway smooth muscles (ASM) actomyosin cross-bridge cycling mechanism, which is the main driving force for airway constrictions in asthmatic attacks. It consists of an electrical stimulation triggering chemical activation followed by mechanical attachment/detachment between myosin and actin. This leads to lumen contraction and then respiratory bronchoconstriction. Various mechanisms in different parts of the lung can generate breathing difficulties. While excessive airway narrowing due to ASM hyperconstriction is a major symptom in many respiratory diseases including asthma, upper airway collapse is the main contributor to Obstructive Sleep Apnea (OSA) symptoms. Can external disturbance induced by superimposed pressure oscillation (SIPO) trigger those physiological mechanisms for lung treatments? A series of in vitro experiments and in vivo trials have demonstrated that both tidal and superimposed length oscillations reduce the active force in contracted ASM (healthy and asthmatics) for a relatively long term and that the latter enhances the force reduction of the former. Further, computational and experimental modellings including clinical trials have demonstrated that SIPO can modulate the upper airway and help to reduce the apnea index in a few OSA patients. This presentation demonstrates that SIPO does trigger lung therapy technologies to improve lung compliance and inflammatory stresses, preserve surfactant function and relax contracted ASM.



Dr. Mazlan Abbas

Chief Executive Officer of FAVORIOT Sdn. Bhd

Dr. Mazlan is the co-founder and CEO of FAVORIOT Sdn Bhd. He is ranked Top 10 in IoT Top 100 Influencers by Postscapes 2017 & 2018, ranked Top 20 Global Thought Leaders on the Internet of Things (February 2019) by Thinkers360, ranked No. 20th Thought Leader in IOT by 2014 Analytics Report - The Internet of Things - Top 100 Thought Leaders, ranked among 50 Most Impactful Smart Cities Leaders by World CSR Congress 2017 and UTM Alumni Industry Personality 2016. He is currently one of Global Vision Board Member (2017). Before Favoriot, he spent 2.5 years as CEO of REDtone IOT and 8 years in MIMOS Berhad as Senior Director Wireless Communications Cluster. He also spent 13 years in CELCOM (mobile operator), handling many senior management positions. Prior to Celcom, he spent 10 years as an Assoc. Professor at Universiti Teknologi Malaysia. He is currently the Adjunct Professor for Universiti Malaysia (UniMY) and Universiti Teknologi Petronas (UTP). He was also the Adjunct Professor for UTM from 2008 to 2013, UTHM (2004-2005, 2013-2016) and UniSZA (2017). Dr. Mazlan is a frequent speaker in many major & established IOT, Smart Cities and telco conferences locally and globally. He sits in Industry Advisory Panel (IAP) for several local universities. He graduated from Universiti Teknologi Malaysia with a BEE (1984), University of Essex (UK) with MSc. in Telematics (1986) and Universiti Teknologi Malaysia with a PhD in Telecommunications (1993). He also received an Honorary Doctorate in Electrical Engineering from UTHM (2017). IR 4.0 and IoT – The Need for a Wake-Up Call

IR 4.0 AND IOT – THE NEED FOR A WAKE-UP CALL

In reality, we are in a very confusing Era. At one end, we have the vision and wish to move towards the Fourth Industrial Revolution but in actual fact, we are still in a mixed era of IR1.0, IR 2.0, IR3.0 and IR 4.0.

There's a difference between the word "Revolution" and "Evolution". Revolution is about transformational change and evolutionary is incremental change. These two have a different set of a thinking process. Are we ready to embrace? What are the challenges and how can we overcome them? Or take the risk of becoming obsolete by being left behind. Do we still need that "Wake Up Call?"



Prof. Dr. Rozaini Roslan

Faculty of Applied Science and Technology
Universiti Tun Hussein Onn Malaysia

Prior to joining Universiti Tun Hussein Onn Malaysia, Prof. Dr. Rozaini Roslan worked at Universiti Kebangsaan Malaysia (UKM) and Universiti Malaysia Sabah (UMS). Currently, he is a faculty member of the Department of Mathematics and Statistics, Faculty of Applied Sciences and Technology, Universiti Tun Hussein Onn Malaysia. He received the BSc majoring in Mathematics from UKM, MPhil in Applied Mathematics from the University of Leeds and obtained his Ph.D. in Fluid Mechanics from UMS. His research interests include free and mixed convection, boundary layer, numerical and analytical methods including perturbation method: matched asymptotic expansion, homotopy methods: HAM, HPM, OHAM; finite difference method and finite volume method. He also uses Comsol to solve some mathematical modelling problems. Currently, his research interest is blood flow modelling problem. One of his interesting results is the existence of a steady profile from an unsteady problem. He is a life member of the Malaysian Mathematical Sciences Society (PERSAMA) and an appointed member of the Centre for Modeling and Data Analysis (DELTA), UKM.

STEADY PROFILES SUBJECTED TO OSCILLATING BOUNDARY CONDITIONS

From the previous experimental studies involving either stationary fluid around an oscillating cylinder or oscillating fluid around a fixed cylinder, a steady streaming flow pattern around the cylinder could be found. In particular, the flow in the vicinity of a horizontal circular cylinder oscillating harmonically at high frequency (in the direction perpendicular to the cylinder axis) within a stationary fluid medium tend to be steady after a long time. Similar observation was reported for free convection problem involving oscillating temperature. The current works involve Newtonian and non-Newtonian flow analyses for several geometrical bodies. The analyses were performed using several analytical and numerical methods. We found that oscillating boundary conditions could produce steady patterns of temperature and stream function.



Prof. Dr. Che Hassan Che Haron
Universiti Kebangsaan Malaysia, UKM

Che Hassan Che Haron is a Professor at Centre for Engineering Materials & Smart Manufacturing, Faculty of Engineering and Built Environment at the Universiti Kebangsaan Malaysia. He is currently the Deputy Dean for Research and Innovation. He is also the Head of Cluster for Advanced Technology and Smart Manufacturing Cluster and Research University Committee Member at Kementerian Pendidikan Malaysia. He is also MyRA Task Force and auditor for KPM. He was the Director for Research Management Centre in UKM. His research interests are in the manufacturing and productions engineering, specifically, in machining, cutting tool technology, tribology and machinability of difficult to machine materials such as titanium, Inconel 718 and composite materials. He also involved in wear of cutting tools, chip formation and the application of response surface methodology for design of experiment. He has published more than 200 journal articles and conference papers. He has obtained 5 patents and 1 industrial design.

SUSTAINABLE MACHINING OF INCONEL 718 ALLOY: DRY, MQL AND CRYOGENIC COOLING

Sustainable machining can be defined as the manufacture of products by a subtractive process by cutting action of a tool that is nonpolluting and minimizes damage to the environment and humans. For this reason, new clean technologies and proposals of work methods are required; they have to integrate the ecological and social dimensions at an operational level in the manufacturing processes. Inconel 718 is a nickel-based alloy which is mainly applied in the aircraft industries due to its high strength and excellent thermal and corrosion resistant. It is also known as difficult-to-cut material due to its abrasive, work hardening and low thermal conductivity characteristics that contribute to the high generation of heat and friction during cutting. The use of coolant is known to be one of effective method to facilitate the heat dissipation from the cutting zone. Recent trends in metal cutting shows the increasing of demand at the global stage for the application of eco-friendly machining approaches in order to eliminate the adverse effects of conventional cutting fluids. This experimental work was conducted to evaluate the performance of sustainable cooling techniques of cryogenic carbon dioxide (CO₂), Minimum Quantity Lubrication (MQL), cryogenic liquid nitrogen (LN₂) and dry cutting on machinability of Inconel 718. For the cryogenic CO₂ approach, a new concept of cryogenic cooling technique was introduced for efficient and consistent cooling performance. The results displayed cryogenic CO₂ is more effective in improving cutting force and surface roughness compared to others. As compared to cryogenic LN₂ and dry cutting, cryogenic CO₂ managed to reduce cutting force by almost 55% and 57.5% respectively. The slight difference of cutting force between cryogenic CO₂ and MQL by only 5.2% showed the remarkable role of the lubricant to reduce friction at tool-chip and tool-workpiece interfaces. However, for the surface roughness, the cryogenic CO₂ exhibited superior improvement as it is 41.4%, 12.6%, and 62.8% better than MQL, cryogenic LN₂, and dry cutting respectively. Thus, it can be said that the adequate and consistent cooling effect by the coolant is more effective to disperse the generated heat and provide a significant influence on the cutting force and surface quality as both of them are heat-dependent. Nevertheless, the benefits of these machining approaches require more in-depth studies including the economic and practical aspects since some approaches require a substantial initial system investment.



**7th IEEE International Conference on
Mechatronics Engineering**

ICOM'19

MESSAGE FROM THE CHAIRMAN OF ICOM'19



Syamsul Bahrin Abdul Hamid

Chairman

7th IEEE International Conference on Mechatronics Engineering 2019

Assalamu'alaikum Warahmatullahi Wabarakatuh and warmest greetings to all the participants of ICOM 2019.

I am very happy to welcome all the participants of the 7th International Conference on Mechatronics (ICOM 2019). The first ICOM was organized in 2001 with an overwhelming response from the researchers from more than ten different countries. So far, the Department of Mechatronics of IIUM has successfully organized six ICOMs. We believe we would be able to maintain the continuity of ICOM from now onwards, inshaAllah. The discipline of Mechatronics has now started to become main-stream with most nations including Malaysia started to update its policy to be more industrial 4.0 ready. The discipline now has penetrated into all walks of life with its products alleviating the current standard of life that we have. Specifically, recent advances in mechatronics are being extended from precision agriculture to healthcare. In the recent past, robots were mostly found to be used in the manufacturing industries. Now, with the advancement of mechatronics, the use of robots started to take a firm footing in the areas of underwater robotics, driverless cars, autonomous aerial vehicles, microsurgery, Brain Machine Interaction (BMI) and so on. In the future, robots in various form are expected to be as ubiquitous as what mobile phone is in this century. With this idea forward and considering the United Nations Sustainable Development Goals (SDGs) 2030, we would foresee that Mechatronics discipline would definitely play an active role in pushing forward towards achieving goal number 9: Industry, Innovation and Infrastructure and goal number 11: Sustainable Cities and Communities of the SDGs. Thus, it is my firm believes and expectation that ICOM will be the platform for interaction and exchange of ideas among the scientists and engineers to bring about new knowledge and sustainable technology especially those that links to UN SDGs - establishing a better tomorrow for the future generations to come. I would like to take this opportunity to express my sincere appreciation to the members of the International Advisory board, the keynote speakers, all committee members of ICOM 2019 and the reviewers of papers for their efforts in making this event successful. My sincere gratitude is extended to the sponsors for their cooperation and contribution in realizing the event.

Wassalam and May Allah help this conference to be a pivotal moment in improving the life of humanities!

Wassalam.

DR. SYAMSUL BAHRIN ABDUL HAMID

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CONFERENCE TOPICS

The conference theme "**Bridging Technology and Society Through Mechatronics**" will highlight the following (but not limited to) topics:

Intelligent systems	Active vibration control
Advanced instrumentation and control	Computer and information technology
Signal and image processing	MEMS and NEMS
Machine vision	Biomechatronics and rehabilitation engineering
Human-machine interface	Mechatronics education
Robotics	Autonomous systems
Automation	Energy and sustainability
Manufacturing mechatronics	Transportation systems
Smart materials and structures	Fault detection and diagnosis
Sensors and actuators	Machine learning

Parallel Technical Sessions 1, Wednesday, 30 October 2019: 14.00 – 16.30			
Time	Chairperson: Assoc. Prof. Dr. Tanveer Saleh Co-chair: Dr. Ab Halim Embong Venue: Hall 4A RA: Robotic & Automation	Chairperson: Assoc. Prof. Dr Mahbubur Co-chair: Assist. Prof Dr. Azhar Ibrahim Venue: Hall 4B ISMV: Intelligent system and machine vision	Chairperson: Assoc Prof. Fauziah Toha Co-chair: Dr Nik Wahidah Venue: Hall 4C HER: Healthcare Engineering and Rehabilitation
14.00 – 14.20	Paper ID: 01 Hybrid Robust Control for Payload Sway of A 2d Overhead Crane <i>Auwalu Abdullahi and Zaharaddin Mohammed</i> Nigeria	Paper ID: 05 Comparison of Machine Learning Classifiers for dimensionally reduced fMRI data using Random Projection and Principal Component Analysis <i>Farahana Suhaimi and Zaw Zaw Htike</i>	Paper ID: 10 Optimal Linear Quadratic Gaussian Torque Controller (LQG) for Upper Limb Rehabilitation <i>Shawgi Younis Ahmed Mounis, Norsinnira Zainul Azlan and Sado Fatai</i>
14.20 – 14.40	Paper ID: 02 A Comparative Study of PD, LQR and MPC on Quadrotor Using Quaternion Approach <i>Maidul Islam and Mohamed Okasha</i>	Paper ID: 11 State-driven Architecture Design for Safety-critical Software Product Line <i>Mozamil Ebnauf, Hanny H. Ammar, Mohamed Abdelhamid, Walid Abdelmoez and Aisha Hassan</i>	Paper ID: 25 Securing Medical Data Transmission Systems Based on Integrating Algorithm of Encryption and Steganography <i>Muhammed Mahdi Hashim, Mustafa Sabah Taha, Azana Hafizah Mohd Aman, Aisha Hassan Abdalla Hashim and Mohd Shafry Mohd Rahim</i>
14.40 – 15.00	Paper ID: 07 Lane Detection on Embedded Platform for Advanced Driver Assistance System (ADAS) <i>Nurul Syuhada Ahmad Rudin, Yasir Mohd. Mustafah, Nurul Hidayah Mahamud, Hasan Firdaus Mohd. Zaki, Zulkifli Zainal Abidin and Hasbullah Abd. Rahman</i>	Paper ID: 12 Performance Evaluation of Scenario-aware Protocol for Producer Mobility Support in NDN <i>Muhammed Zaharadeen Ahmed, Aisha Hassan Abdalla Hashim, Othman Omran Khalifa, Huda Adibah Bt. Mohd. Ramli and Afaf Mirghani Hassan</i>	Paper ID: 34 A Wideband Millimeter-Wave Printable Antenna on Flexible Substrate for Breast Cancer Imaging <i>Md.Shazzadul Islam, Muhammad I. Ibrahimy, S. M. A. Motakabber, A. K. M. Zakir Hossain and S. M. Kayser Azam</i>

15.00 – 15.30	Break		
15.30 – 15.50	<p>Paper ID: 13 Motion Estimation on Homogenous Surface for Around View Monitoring System</p> <p><i>Syahirah Hanizam, Nik Nur Wahidah Nik Hashim, Zulkifli Zainal Abidin, Nurul Hidayah Mahamud, Hasbullah Abdul Rahman and Hasan Firdaus Mohd Zaki</i></p>	<p>Paper ID: 17 PID Controller for BLDC Motor</p> <p><i>S. M. A. Motakabber, Md Mahmud, Ahm Zahirul Alam and Anis Nurashikin Nordin</i></p>	<p>Paper ID: 39 Development Of Gripping Assistive Device For Training System</p> <p><i>Rais Ramlee, Hazlina Md Yusof and Shahrul Naim Sidek</i></p>
15.50 – 16.10	<p>Paper ID: 15 Optimized State Feedback Control of Quarter Car Active Suspension System based on LMI Algorithm</p> <p><i>Adamu Yawale Babawuro and Nura Tahir Musa Nigeria</i></p>	<p>Paper ID: 24 Utilization of different deep learning models for regression</p> <p><i>Nouar Aldahoul and Zaw Zaw Htike</i></p>	<p>Paper ID: 40 Tactile Graphics Exploration Studies Using Fingertip Tracking Based On Colour Markers Detection For Visually Impaired People</p> <p><i>Muhammad Ikmal Hakim Shamsul Bahrin, Hazlina Md Yusof and Shahrul Na'im Sidek</i></p>
16.10 – 16.30	<p>Paper ID:16 Development of eCall for Malaysia's Automotive Industries</p> <p><i>Mohd Aliff Mushthalib, Hasmah Mansor and Zulkifli Zainal Abidin</i></p>	<p>Paper ID: 26 A Resource-efficient Mobility Management Scheme to Analyze Handoff Performance in PNEMO Environment</p> <p><i>Shayla Islam, Aisha Hassan Abdalla Hashim and Mohammad Kamrul Hasan</i></p>	<p>Paper ID: 42 Modules of Interaction for ASD Children Using Rero Robot (Humanoid)</p> <p><i>Nor Izzati Ishak, Hazlina Md Yusof, Rais Ramlee, Shahrul Na'Im Sidek and Nazreen Rusli</i></p>
16.30 - 17.00	<p>Refreshment Venue: Foyer (Hall 2, 3 and 4)</p>		

DAY 2, THURSDAY, 31 OCTOBER 2019

ICAMME'19 Keynote Session, Thursday, 31 October 2019: 9.00 – 9.50

Keynote Speech 5: Dr Mazlan Abbas

CEO of FAVORIOT Sdn Bhd

Title: IR 4.0 and IoT – The Need for a Wake Up Call

Chairperson: Assist. Prof. Dr. Syamsul Bahrin **Venue:** Hall 4

9.50 - 10.20

Refreshment

Venue: Foyer (Hall 2, 3 and 4)

Parallel Technical Sessions 2, Thursday, 31 October 2019: 10.20 – 12.20

Time	Chairperson: Assoc Prof. Dr. Shahrul Naim Co-chair: Dr. Affendy Venue: Hall 4A RA: ROBOTIC & AUTOMATION	Chairperson: Assoc. Prof. Dr. Yasir Mustafa Co-chair: Assist. Prof. Dr. Nor Hazrin Venue: Hall 4B ISMV: Intelligent system and machine vision	Chairperson: Assoc Prof. Dr Zaw Zaw Co-chair: Dr. Farahiyah Venue: Hall 4C Healthcare Engineering and rehabilitation
10.20 – 10.40	Paper ID: 18 Paper title: Euler-Lagrange based Dynamic model of Double Rotary Inverted pendulum <i>Mukhtar Hamza, Jamilu Adamu, Abdulbasid Isa and Musa BelloAfidalina Tumian and Wan Wardatul Amani Wan Salim</i>	Paper ID: 28 Robust, Fast and Accurate Lane Departure Warning System using Deep Learning and Mobilenets <i>Rashidah Funke Olanrewaju, Ahmad Syarifuddin Ahmad Fakhri, Mistura L. Sanni and Mosud Taiwo Ajala</i>	Paper ID: 44 Around View Monitoring System with Motion Estimation in ADAS Application <i>Nik Nur Wahidah Nik Hashim, Muhammad Hannan Fathi Rasdi and Syahirah Hanizam</i>
10.40 – 11.00	Paper ID: 27 Optimized Output-Based Input shaping for Control of Single Link Flexible Manipulator using Linear Matrix Inequality <i>Nura Tahir and Adamu Yawale Babawuro</i>	Paper ID: 30 Speech De-reverberation Enhancement <i>Othman Khalifa and Safiyah Hasmad</i>	Paper ID: 48 Classifying Motion Intention from EMG signal: A k-NN Approach <i>Ismail Mohd Khairuddin, Shahrul Naim Sidek, Anwar P.P. Abdul Majeed and Asmarani Ahmad Puzi</i>
11.00 – 11.20	Paper ID: 33 Electromagnetic Seamless two-speed gearbox for electric vehicle <i>Ataur Rahman, Abdul Hassan Jaffar and Nurul Hassan</i>	Paper ID:32 A Cloud-Based Bus Tracking System via Internet-of-Things Technology <i>Sharmin Akter, Thouhedul Islam, Rashidah Funke Olanrewaju and Binyamin Adeniyi Ajayi</i>	Paper ID: 54 Analytical study for the potential solar energy produced in Nibong Tebal <i>Hisham Sa'ad, Syafrudin Masri, Hafeez Hariri and Abdul-Malik Saad</i>

11.20 – 11.40	<p>Paper ID: 35 LQR-Based Stabilization and Position Control of a Mobile Double Inverted Pendulum</p> <p><i>Dhanika Ratnayake and Manukid Parnichkun</i></p>	<p>Paper ID:38 An Effective Machine Learning Approach for Sentiment Analysis on Popular Restaurant Reviews in Bangladesh</p> <p><i>S M Asiful Huda, Md. Mohiuddin Shoikot, Md. Anower Hossain and Ishrat Jahan Ila</i></p>	<p>Paper ID: 62 Motor Imagery based Multivariate EEG Signal Classification for Brain Controlled Interface Applications</p> <p><i>Fatima Farooq, Nasir Rashid, Amber Farooq, Muzamil Ahmed, Ayesha Zeb and Javaid Iqbal</i></p>
11.40 – 12.00	<p>Paper ID: 36 Assumptions of Lateral Acceleration Behavior Limits for Prediction Tasks in Autonomous Vehicles</p> <p><i>Peter Zechel, Ralph Streiter, Klaus Bogenberger and Ulrich Goehner</i> USA</p>	<p>Paper ID:41 Road Accidents Data Analysis using Artificial Neural Network</p> <p><i>Fazeel Ahmed Khan</i> Pakistan</p>	<p>Paper ID: 63 Fetal Biometry Assessment of Femur Length for Pregnant Women in Dammam, Saudi Arabia</p> <p><i>Hana Almarri, Ramzun Maizan Ramli and Nurul Zahirah Noor Azman</i></p>
12.00 – 12.20	<p>Paper ID: 37 Pneumatic actuation of a firefighting robot: A theoretical Foundation and an Empirical study</p> <p><i>Mosud Taiwo Ajala, Md. Raisuddin Khan, Momoh Jimoh E. Salami, Amir Akramin Shafie, Majeed Olaide Oladokun and Mohamad I. Mohamad Nor</i></p>	<p>Paper ID: 43 Car Detection using Cascade Classifier on Embedded Platform</p> <p><i>Muhammad Asyraf Zulkhairi, Yasir Mohd Mustafah, Zulkifli Zainal Abidin, Hasan Firdaus Mohd Zaki and Hasbullah Abdul Rahman</i></p>	<p>Paper ID: 69 Low Cost Piezoresistive Pressure Sensor Matrix for Pressure Ulcer Prevention and Management</p> <p><i>Fawwaz Eniola Fajingbesi, Amelia Wong Azman, Ahmad Zuraida, Rashidah Funke Olanrewaju, Muhammad Ibrahimy and Yasir Mohd Mustafah</i></p>
13.00 - 1400	Lunch		Venue: Pot and Pan Restaurant

Parallel Technical Sessions 3, Thursday, 31 October 2019: 14.00 – 15.40			
Time	Chairperson: Prof. Dr. Md. Amir Shafie Co-chair: Dr. Wahju Sedino Venue: Hall 4A RA: Robotic & Automation	Chairperson: Dr. Norsinnira Co-chair: . Dr. Ahmad Jazlan Venue: Hall 4B ISMV: Intelligent System and Machine Vision	Chairperson: Dr. Hazlina Yusuf Co-Chair: Dr. Liyana Venue: Hall 4C MS: Mechatronics System
14.00 – 14.20	Paper ID: 49 Kinematics Analysis and Trajectory Validation of Two Cooperative Manipulators Handling a Flexible Beam <i>Abdul Rahman Samewoj, Norsinnira Zainul Azlan and Md. Raisuddin Khan</i>	Paper ID: 45 RECOGNITION OF ISOLATED HANDWRITTEN ARABIC CHARACTERS <i>Nik Nur Wahidah Nik Hashim and Osamah Abdulrahman Almansari</i>	Paper ID: 46 Long Term Load Forecasting using Grey Wolf Optimizer – Artificial Neural Network <i>Zuhaila Mat Yasin, Nur Ashida Salim and Nur Fadilah Ab Aziz</i>
14.20 – 14.40	Paper ID: 56 Optimal Tracking Control Experiments for 2-DOF Helicopter: An Open-Implementation Approach <i>Kenneth Vonckx, Glenn Janiak and Md Suruz Miah</i>	Paper ID:66 Real Time Implementation of Intelligent Controller for the Control of Cement Dust Emission in Wet Scrubber System <i>Sambo Aliyu Umar, Adamu Yawale Babawuro and Md Raisuddin Khan</i>	Paper ID: 73 Optimization of PD-type Fuzzy Logic controller for Position Control of Spherical Robot <i>Nurul Nafisah Kamis, Abd Halim Embong and Salmiah Ahmad</i>
14.40 – 15.00	Paper ID: 59 Analysis of point to point Robotic Arm control using PI controller <i>Safiuddin Che Suhaimin, Nur Liyana Azmi, Hazlina and Md Mozasser Rahman</i>	Paper ID:67 Energy-Efficient Scalable Routing Protocol Based on ACO for WSNs <i>Afsah Sharmin, Farhat Anwar and S M A Motakabber</i>	Paper ID: 52 Hybrid Social Force-Fuzzy Logic Evacuation Simulation Model For Multiple Exits <i>Azhar Mohd Ibrahim, Mahsin Saifullah, Muhammad Rabani Mohd Romlay, Ibrahim Venkat and Izihan Ibrahim</i>
15.00 – 15.20	Paper ID: 47 Deep Learning Methods for Facial Expression Recognition <i>Chowdhury Mohammad Masum Refat and Norsinnira Zainul Azlan</i>	Paper ID: 55 MAFOSS: Multi-Agent Framework using Open-Source Software <i>Eric Jones, Dakota Adra and Md Suruz Miah USA</i>	Paper ID:65 Numerical Braille Module For Learning Simple Mathematical Operations <i>Mohamad Safiddin Mohd Tahir and Noor Hazrin Hany Mohamad Hanif</i>

15.20 – 15.40	Paper ID: 50 Development and Performance Evaluation of Modular RC-based Power Supply for Micro-EDM Wan Ahmad Bin Wan Azhar and Tanveer Saleh	Paper ID: 58 Development of an Active Fixture for Ultrasonically Assisted Micro Electro-Discharge Machining <i>Md Shohag Mollik, Wazed Ibne Noor, Tanveer Saleh and Mohammed Gamal Abdul Hameed Bazarah</i>	
15.40 – 16.00	Best Papers Awards and Closing Session		Venue: Hall 1
16.00 – 16.30	Refreshment		Venue: Foyer (Hall 2, 3 and 4)



5th International Conference on Mathematical Applications in Engineering ICMAE '19

Co-organiser



MESSAGE FROM THE CHAIRMAN OF the 5th ICMAE'19



Dr. Mohd Lukman Inche Ibrahim

Chairman

5th International Conference on Mathematical Applications in Engineering 2019 (ICMAE'19)

Assalamu'alaikum

Mathematics is a pre-requisite in advancing many fields, including science and engineering. Mathematics provides the methodology and framework of rigorous thoughts in understanding and unveiling the beauty of science, and consequently, in applying science to solve real world problems and improve our lives. It is astonishing how technologies have made our life better and this would not be possible without mathematics.

The Kulliyah of Engineering, IIUM, in collaboration with Centre of Research on Computational Mathematics (CERCOM), UTHM are therefore proud to present the 5th International Conference on Mathematical Applications in Engineering 2019 (ICMAE'19). We envision ICMAE'19 to be a platform for academicians and researchers to meet, exchange ideas and present the latest innovations and findings involving mathematical applications in various field of studies. We sincerely hope that all participants would gain as much as possible from the intellectual discourses planned throughout the event.

I would like to express my utmost appreciation to all steering and working committees, from both IIUM and CERCOM, for making this event a success. The publication of full length research articles of this conference would not be possible without the critical assessments and feedback from the appointed reviewers. I hereby wish to convey my sincere gratitude to all of them. Finally, thank you to all participants for your support and it is hoped that we meet again in ICMAE'21, *insha'Allah*.

Wassalam,

DR. MOHD LUKMAN INCHE IBRAHIM

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Assoc. Prof. Dr. Jamal I. Daoud

Assoc. Prof. Dr. Md Sazzad Hossien Chowdhury

Website, publicity, and paper submission

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Dr. Maziati Akmal Mohd Hatta

Dr. Abdul Aziz Ahmad

Dr. Hanisah Manshor

Dr. Noraini Mohamed Noor

Dr. Lee Siaw Chong (CERCOM)

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Dr. Noraini Mohamed Noor

Dr. Mohd Saiful Riza Bashri

Dr. Abdul Aziz Ahmad

Programme

Assoc. Prof. Dr. Md Sazzad Hossien Chowdhury

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Payment and registration

Dr. Kartini Ahmad

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Assoc. Prof. Dr. Md Sazzad Hossien Chowdhury

Dr. Zaharah Wahid

Food

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CONFERENCE TOPICS

Conference topics include but not limited to the following topics:

- Mathematical physics and differential equations
- Algebra & analysis
- Mathematical modelling & simulation
- Probability & mathematical statistics
- Analytical & numerical methods

Parallel Technical Sessions 1, Wednesday, 30 October 2019: 14.00 – 16.20			
Time	Chairperson: Dr. Jamal I. Daoud Venue: Hall 3A (PROBABILITY & MATHEMATICAL STATISTICS)	Chairperson: Prof. Abdumalik Rakhimov Venue: Hall 3B (MATHEMATICAL MODELLING & SIMULATION)	Chairperson: Dr. Suazlan Mt. Aznam Venue: Hall 3C (ANALYTICAL & NUMERICAL METHODS)
14.00 – 14.20	<p>Paper ID: SC004 Statistical Analysis Investigation on Vegetable Oils Stability During Deep Frying using Selected Quality Parameters</p> <p><i>Jamal I. Daoud and Mohamed E. S. Mirghani</i> Malaysia</p>	<p>Paper ID: SC001 Interactive Multi Resolution 2D Cellular Automata Model for Tsunami Wave Propagation</p> <p><i>E. Syed Mohamed</i> India</p>	<p>Paper ID: SC006 A Numerical Solution for Heat Transfer Past a Stretching Sheet with Ohmic Dissipation and Suction or Injection Problem using Haar Wavelet Quasilinearization Method</p> <p><i>Nor Artisham Che Ghani and Suazlan Mt Aznam</i> Malaysia</p>
14.20 – 14.40	<p>Paper ID: SC016 Statistical Investigation for Cutting Force and Surface Roughness of S45C Steel in Turning Processes by I-Kaz Method</p> <p><i>R. Samin, M. Z. Nuawi, S. M. Haris and J. A. Ghani</i> Malaysia</p>	<p>Paper ID: SC012 Modelling Steady Convection-Dominated Phenomena by Node-Adaptive Radial Point Interpolation Meshfree Method (RPIM) with Various RBFs</p> <p><i>Krittidej Chanthawara and Sayan Kaennakham</i> Thailand</p>	<p>Paper ID: SC007 Analytical Solution of Homogeneous One-Dimensional Heat Equation Using Separation of Variables</p> <p><i>Norazlina Subani, Faizzuddin Jamaluddin, Muhammad Arif Hannan Mohamed and Ahmad Danial Hidayatullah Badrolhisam</i> Malaysia</p>
14.40 – 15.00	<p>Paper ID: SC018 Impact of Similarity Measures Combining Preprocessing Wise On K-Means Clustering Algorithm</p> <p><i>Dauda Usman and Ibrahim Lawal Kane</i> Nigeria</p>	<p>Paper ID: SC022 Dynamical Analysis of Chemostat Model Incorporated with Substrate Inhibition and Variable Yield Coefficient</p> <p><i>Ummal Aisha Farhana Mohd Sadiq, Siti Suhana Jamaian, and Hamizah Mohd Safuan</i> Malaysia</p>	<p>Paper ID: SC010 Hybrid Numerical Solution for Unsteady State of Constant Accelerated MHD in a Third-grade Fluid with a Rotation</p> <p><i>Shafaruniza Mahadi, Faisal Salah, Norazam Arbin and S. H. Yeak</i> Malaysia</p>

15.00 – 15.20	<p>Paper ID: SC038 Subset Selection in High-Dimensional Genomic Data using Hybrid Variational Bayes and Bootstrap Priors</p> <p><i>O. R. Olaniran and M. A. A. Abdullah</i> Nigeria / Malaysia</p>	<p>Paper ID: SC023 The Fractionalization of Modified Logistic Equation</p> <p><i>Liyana Nadhira Kaharuddin, Siti Suhana Jamaian, and Chang Phang</i> Malaysia</p>	<p>Paper ID: SC021 Solving Boundary Value Problems with Mixed Boundary Conditions using Direct Diagonally Block Method</p> <p><i>Nadirah Mohd Nasir, Zanariah Abdul Majid, Fudziah Ismail, and Norfifah Bachok</i> Malaysia</p>
15.20 – 15.40	<p>Paper ID: SC055 Analysis of Wage Distribution in Malaysia</p> <p><i>Mahdir Bahar, Assis Kamu, Norhayati Jantan, and Darmesah Gabda</i> Malaysia</p>	<p>Paper ID: SC028 Construction on Morphology of Aquatic Animals via Moving Least Squares Method</p> <p><i>Chee Kin Cheah and Wah Yen Tey</i> Malaysia</p>	<p>Paper ID: SC041 Oblique Wave Propagation over an Elastic Bottom Undulation in a Two-Layer Fluid Flow</p> <p><i>Swaroop Nandan Bora and Ayan Chanda</i> India</p>
15.40 – 16.00	<p>Paper ID: SC059 Cox's Model for Prison Partly Interval Censored Data</p> <p><i>Shaikha Ahmedi, Faiz A. M. Elfaki, and Iling Lukman</i> Qatar / Indonesia</p>	<p>Paper ID: SC043 Nonlinear Dynamics of a Magnetically Supported Flexible Rotor in Auxiliary Bearings</p> <p><i>Jawaid I. Inayat-Hussain</i> Malaysia</p>	<p>Paper ID: SC056 A Mathematical Proof of Explicit Formulas for the Coefficients of Finite Difference Approximations of Higher-Order Derivatives</p> <p><i>Havid Syafwan, Mahdhivan Syafwan, William Ramdhan, and Riki Andri Yusda</i> Indonesia</p>
16.00 – 16.20	<p>Paper ID: SC068 Taguchi Robust Design as a Way to Optimize Rubber Glove Process</p> <p><i>Zaharah Wahid, Ming T. Tham, and Kartini Ahmad</i> Malaysia / United Kingdom</p>	<p>Paper ID: SC044 Some Experimental Results of Station Cone Algorithm in Comparison with Simplex Algorithm for Linear Programming</p> <p><i>Nguyen Ngoc Chu and Le Thanh Hue</i> Vietnam</p>	<p>Paper ID: SC074 Bi-Orthogonal Wavelets for Investigating Gibbs Effects via Oblique Extension Principle</p> <p><i>Mutaz Mohammad</i> UAE</p>
16.20-17.00	Refreshment		Venue: Foyer (Hall 2, 3 and 4)

DAY 2, THURSDAY, 31 OCTOBER 2019

ICMAE'19 Keynote Session, Thursday, 31 October 2019: 9.00 – 9.50

Keynote Speech 6: Professor Dr. Rozaini Roslan – Universiti Tun Hussein Onn Malaysia
Title: Steady Profiles Subjected to Oscillating Boundary Conditions

Chairperson: Assoc. Prof. Dr. Phang Chang

Venue: Hall 3

TEA BREAK: 9.50-10.20

Venue: Foyer (Hall 2, 3, 4)

Parallel Technical Sessions 2, Thursday, 31 October 2019: 10.20 – 13.00

Time	Chairperson: Dr. Md Sazzad H. Chowdhury Venue: Hall 3A (ALGEBRA & ANALYSIS)	Chairperson: Dr. Faiz Elfaki Venue: Hall 3B (MATHEMATICAL MODELLING & SIMULATION / PROBABILITY & MATHEMATICAL STATISTICS)	Chairperson: Dr. Jamal I. Daoud Venue: Hall 3C (MATHEMATICAL PHYSICS & DIFFERENTIAL EQUATIONS / ANALYTICAL & NUMERICAL METHODS)
10.20 – 10.40	Paper ID: SC002 On Classification of 2-Dimensional Evolution Algebras and Its Applications <i>H. Ahmed, U. Bekbaev, and I. Rakhimov</i> Yemen / Uzbekistan / Malaysia	Paper ID: SC046 State Estimation for Dynamic Weighing using Kalman Filter <i>Sunethra Pitawala</i> New Zealand	Paper ID: SC013 A Collocation Method Based on Genocchi Operational Matrix for Solving Emden-Fowler Equations <i>Abdulnasir Isah and Chang Phang</i> Malaysia
10.40 – 11.00	Paper ID: SC003 Classification of Two-dimensional Left (right) Unital Algebras over Algebraically Closed Fields and R <i>H. Ahmed, U. Bekbaev, and I. Rakhimov</i> Malaysia / Yemen	Paper ID: SC050 Generating Project Risk Membership Functions Based on Experts' Estimates and Alpha-Cut Variations <i>Fatin Amirah Ahmad Shukri and Zaidi Isa</i> Malaysia	Paper ID: SC014 Potts Model with Competing Binary-Ternary-Quaternary Interactions on Cayley Tree <i>Nasir Ganikhodjaev, Mohd Hirzie Mohd Rodzhan, and Nurul Farahana Ififi Omar Baki</i> Malaysia
11.00 – 11.20	Paper ID: SC027 Perfect Triangle on the Curve C4 – Unsolved Case	Paper ID: SC058 Comparison Between the Use of Uniform and Non-Uniform Light Absorption Profiles in Modelling Organic Photovoltaics	Paper ID: SC024 On the Uniform Summability of the Fourier-Laplace Series on the Sphere

	Shahrina Ismail and Zainidin Eshkuvatov Malaysia	Husna Amira Hassan and Mohd Lukman Inche Ibrahim Malaysia	Ahmad Fadly Nurullah bin Rasedee , Abdumalik Rakhimov, and Mohamad Hasan Abdul Sathar Malaysia
11.20 – 11.40	Paper ID: SC047 Edge Irregular Reflexive Labeling on Corona of Path and Other Graphs <i>Diari Indriati, Widodo, and Isnaini Rosyida</i> Indonesia	Paper ID: SC069 A Numerical Study of a Compactly-Supported Radial Basis Function Applied with a Collocation Meshfree Scheme for Solving PDEs <i>Sunisa Tavaen, Krittidej Chanthawara and Sayan Kaennakham</i> Thailand	Paper ID: SC045 Grünwald Implicit Solution of One-Dimensional Time-Fractional Parabolic Equations Using HSKSOR Iteration <i>Fatihah Anas Muhiddin, Jumat Sulaiman, and Andang Sunarto</i> Malaysia / Indonesia
11.40 – 12.00	Paper ID: SC049 Generalized Interval-Valued Hesitant Intuitionistic Fuzzy Soft Set <i>Admi Nazra, Jenizon, Sisri Wahyuni, and Zulvera</i> Indonesia	Paper ID: SC071 Rain Fade Analysis on Earth-to-Satellite Microwave Link Operating in Comoros <i>Andhraou Thabiti, Md Rafiqul Islam, and Noreha Abdul Malik</i> Malaysia	Paper ID: SC051 Development of HOPPIE- Basket Ball Coaching APP <i>Wan Azizun Adnan, Siti Mariam Shafie, Sharifah Mumtazah Syed Ahmad, Samsiah Radiman, Aiman Haziq Bin Rashdan, Muhammad Khazin Bin Noor Hisham, Emeirul Ezzudean Bin Jefri, and Salasiah Hitam</i> Malaysia / Saudi Arabia
12.00 – 12.20	Paper ID: SC053 Algorithms to Determine Fuzzy Chromatic Number of Cartesian Product and Join of Fuzzy Graphs <i>Isnaini Rosyida, Widodo, Ch. Rini Indrati, and Diari Indriati</i> Indonesia	Paper ID: SC072 The Effects of Marine Parameters on Salinity Along the Straits of Johor Malaysia <i>F. Mohamad Hamzah and S. N. S. Mohammed, O. Jaafar, and S. M. Syed Abdullah</i> Malaysia	Paper ID: SC057 Twisted Solitons in a Parametrically Driven Discrete Nonlinear Schrödinger Equation <i>Mahdhivan Syafwan</i> Indonesia

12.20 – 12.40		<p>Paper ID: SC073 Statistical Analysis on Physical and Chemical Parameters and Heavy Metal in Marine Water</p> <p><i>F. Mohamad Hamzah, S. Bahari, O. Jaafar, and S. M. Syed Abdullah</i> Malaysia</p>	<p>Paper ID: SC061 Numerical Solution for the Chemotaxis Model by Finite Difference Method</p> <p><i>C. Messikh, M. S. H. Chowdhury, A. Guesmia, Shukrnul Mawa, Abdurahim Okhunov, and Suazlan Mt Aznam</i> Malaysia / Algeria</p>
13.00-14.00	LUNCH	Venue: Pot and Pan Restaurant	
15.40 – 16.00	Closing session and Best papers Awards		Venue: Hall 1
16.00 – 16.30	Refreshment		Venue: Foyer (Hall 2, 3 and 4)



**International Conference on Advances in
Manufacturing and Materials Engineering
ICAMME'19**

MESSAGE FROM THE CHAIRMAN OF ICAMME'19



Assoc. Prof. Dr. Mohamed Abd Rahman

Chairman

International Conference on Advances of Manufacturing and Materials Engineering 2019 (ICAMME 2019)

Assalamu'alaikum Warahmatullaahi Wabaarakaatuh

On behalf of the organizing committee, it is truly an honour to have the opportunity to welcome you to the 4th International Conference on Advances of Manufacturing and Materials Engineering. This conference is a part of IIUM Engineering Congress 2019 (IEC'19); the yearly event organized by the Kulliyah of Engineering, International Islamic University Malaysia.

ICAMME 2019 has attracted many high-quality submissions from a number of countries across the globe. Papers cover advances made in manufacturing and materials engineering including fundamentals in manufacturing processes, environmentally-friendly materials and processes, coatings, polymer composites, simulation, nanotechnology, innovative problem-solving and value engineering to name a few. All accepted papers are peer-reviewed and will be published in the Scopus-indexed International Journal of Recent Technology and Engineering (IJRTE). This bi-annual conference aims to continue serving as a platform for exchange of ideas on cutting edge research and innovation in the field of manufacturing and materials engineering as well as to foster research networks and worldwide collaborations.

Lastly, I would like to express our sincere gratitude and appreciation to all keynote speakers, conference participants, session chairs, members of the organizing and advisory committees, reviewers, sponsors as well as guests who have contributed and participated to make this conference a successful one.

Happy and fruitful conferencing!

Wassalam.

ASSOC. PROF. DR. MOHAMED ABD RAHMAN

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CONFERENCE TOPICS

- Graphene
- Carbon Nano Tube
- 2D Materials
- Nano materials
- Materials for renewable and sustainable energy harvesting
- Smart Materials
- Functional Materials
- Nanoelectronics
- NEMS
- Advanced Composite
- Ceramics
- Metallics Materials
- Corrosion of Materials
- Heritage Preservation
- Electrochemistry
- Lean Manufacturing
- Flexible Manufacturing
- Green Manufacturing
- Additive Manufacturing
- Rapid Prototyping
- Metal Forming
- CIM
- CAD
- CAE
- Other relevant topics

Parallel Technical Sessions 1, Wednesday, 30 October 2019: 14.00 – 16.30			
Time	Chairperson: Prof. Dr. Iis Sopyan Co-Chair: Dr. Noorasikin Samat Venue: Hall 2A (ADVANCED & SUSTAINABLE MATERIALS)	Chairperson: Assoc. Prof. Dr. Tasnim Firdaus Mohamed Ariff Co-Chair: Dr. Siti Haryani Tomadi Venue: Hall 2B (SMART MANUFACTURING)	Chairperson: Dr. Ahmad Zahirani Ahmad Azhar Co-Chair: Dr. Nur Ayuni Jamal Venue: Hall 2C (ADVANCED & SUSTAINABLE MATERIALS)
14.00 – 14.20	<p>Paper ID: 104 Impact and Fire Resistance Properties of Polypropylene Filled with Graphene/Mg(OH)₂ Nanoparticles</p> <p><i>Ruey Shan Chen and Sahrim Ahmad</i> Malaysia</p>	<p>Paper ID: 137 Burr Control Using Modified Tool Geometry: A 3D FEM Approach</p> <p><i>Muhammad Asad</i> Saudi Arabia</p>	<p>Paper ID: 134 Study of Surface Modification on Die-Casting AZ91D Magnesium Alloy</p> <p><i>Fatin Shaera Zuhari, Nur Liyana, Rozie Nani Ahmad and Siti Norbahiyah</i> Mohamad Badari Malaysia</p>
14.20 – 14.40	<p>Paper ID: 171 Study on Physicochemical Status, Bacterial Analysis and Its Correlation</p> <p><i>MN Uddin, Z Mahabub, MM Rahman, MR Rana, N Haque, MS Islam, S Ahammed, Rupal Roy and MM Rashid</i> Bangladesh / Malaysia</p>	<p>Paper ID: 123 Optimum Surface Roughness, Tool Wear and Cutting Force for Titanium Alloy in Turning Process Using Taguchi Method</p> <p><i>Razali Samin, Nurhidayah Azman, Mohd Zaki Nuawi, Sallehuddin M. Haris and Jaharah A. Ghani</i> Malaysia</p>	<p>Paper ID: 140 Effect of Nano-CuO Grain Size on Heat Transfer Performance of Copper Substrate</p> <p><i>M H Mahmood, Md Abdul Maleque and Suryanto</i> Malaysia</p>
14.40 – 15.00	<p>Paper ID: 162 The Production and Characterization of Lanolin and Polylactic Acid Based Nano Structures for Wound Management</p> <p><i>Muhammet Uzun and Hüseyin Oymak</i> Turkey</p>	<p>Paper ID: 144 Real Time Implementation of Intelligent Controller for the Control of Cement Dust Emission in Wet Scrubber System</p> <p><i>Sambo Aliyu Umar, Adamu Yawale Babawuro and Md. Raisuddin Khan</i> Nigeria / Malaysia</p>	<p>Paper ID: 141 Development of Abradable Coating on Steel Substrate by High Velocity Oxy-fuel (HVOF) Method</p> <p><i>Raden Ramdan, Budi Prawara, Irma Pratiwi, Syauqi Ramadhan, Bambang Widyanto and Rochim Suratman</i> Indonesia</p>
15.00 – 15.30	Break		

15.30 – 15.50	<p>Paper ID: 118 Cyclic Voltammetry and Charged/Discharged Cycles of Conductive Polymer on Screen-printed Carbon and Platinum Electrodes in Aqueous Media</p> <p><i>Abdelmohsen Benoudjit, Ihda Uswatun Shalihah Shohibuddin, Afidalina Tumian and Wan Wardatul Amani Wan Salim</i> Malaysia</p>	<p>Paper ID: 168 Development of Surface Modification Technology for CEDM Nozzle and Fatigue Enhancement of Ni-based Alloys</p> <p><i>Auezhan Amanov, In-Ho Cho and Young-Sik Pyun</i> South Korea</p>	<p>Paper ID: 143 The Fabrication of Nanocone Array Using Soft Lithography Technique for Antimicrobial Application</p> <p><i>Liyana Shamsuddin, Khairudin Mohamed and Siti Suhaila Md Izah</i> Malaysia</p>
15.50 – 16.10	<p>Paper ID: 125 Effect of Solid Particles Concentration to the Size of Graphene Oxide Liquid Crystals Pickering Emulsion (GOLCsPE)</p> <p><i>Nurul Nadiah Sahir, Noor Azlina Hassan, Norita Hassan, Nor Hasnidawani Johari and Siti Norasmah Surip</i> Malaysia</p>	<p>Paper ID: 170 Review of Coal Fired Power Plants in Bangladesh</p> <p><i>MN Uddin, Z Mahabub, MM Rahman, MR Rana, N Haque, MS Islam, S Ahammed, Rupal Roy and MM Rashid</i> Bangladesh / Malaysia</p>	<p>Paper ID: 145 Effect of ZnO-SiO₂ Nanoparticles on the Morphology of Nanocoating</p> <p><i>Norhasnidawani Johari and Noor Azlina Hassan</i> Malaysia</p>
16.10 – 16.30	<p>Paper ID: 126 The Effect Recycled Polyethylene Terephthalate (PET) Bottles Waste as a Fine Aggregate Replacement in Concrete</p> <p><i>Altamashuddinkhan Nadimalla, Siti Aliyyah Masjuki, Siti Asmahani Saad, Nur Hawa Othman, Ahmad Kamil Amiruddin and Maisarah Ali</i> Malaysia</p>	<p>Paper ID: 138 A Review on The Application of Various MQL Techniques for Metal Cutting Operation of Aluminum Alloy</p> <p><i>Abdul Rahman Abdul Ghani, Natasha A.Raof, Aishah Najiah Dahnel, Nor Khairusshima Muhammad Khairussaleh and Suhaily Mokhtar</i> Malaysia</p>	<p>Paper ID: 147 Viscoelastic Properties of Kenaf/Basalt Reinforced Epoxy Hybrid Composites Through Vacuum Infusion Techniques</p> <p><i>A Atiqah, Mohamed Ansari M.Nainar, K. Chandran, K. Surenthiran, M. Jawaid and A. Hamdan</i> Malaysia</p>
16.30 - 17.00	<p>Refreshment</p>		
			<p>Venue: Foyer (Hall 2, 3 and 4)</p>

DAY 2, THURSDAY, 31 OCTOBER 2019			
ICAMME'19 Keynote Session, Thursday, 31 October 2019: 9.00 – 9.50			
<p>Keynote Speech 7: Professor Dr Che Hassan Che Haron – University Kebangsaan Malaysia Title: Sustainable Machining of Inconel 718 Alloy: Dry, MQL and Cryogenic Cooling</p> <p>Chairperson: Prof. Erry Yulian Triblas Adesta Venue: Hall 2</p>			
9.50 - 10.20	Refreshment		Venue: Foyer (Hall 2, 3 and 4)
Parallel Technical Sessions 2, Thursday, 31 October 2019: 10.20 – 12.20			
Time	Chairperson: Assoc. Prof. Dr. Mohd Hanafi Ani Co-Chair: Dr. Alya Naili Rozhan Venue: Hall 2A (ADVANCED & SUSTAINABLE MATERIALS)	Chairperson: Assoc. Prof. Dr. Mohd Radzi Che Daud Co-Chair: Dr. Natasha A. Raof Venue: Hall 2B (SMART MANUFACTURING)	Chairperson: Dr. Nor Farah Huda Abd. Halim Co-Chair: Dr. Suhaily Mokhtar Venue: Hall 2C (SIMULATION, MODELLING & MANAGEMENT)
10.20 – 10.40	<p>Paper ID: 158 Early Investigation in Porous Aluminum Development via Powder Metallurgy Technique</p> <p><i>Nur Ayuni Jamal, Maizatunlisa Othman, Yusilawati Ahmad Nor, Norhuda Hidayah Nordin and Nahsrah Hani Jamadon Malaysia</i></p>	<p>Paper ID: 161 Effects of Drilled Area Temperatures on Drilling of NFRP Composites: A Review</p> <p><i>Suhaily Mokhtar, Nur Syahira Sofyani Yusof, Mohd Ashraff Mohd Asri, Che Hassan Che Haron, Natasha Binti A. Raof, Nor Khairusshima Muhammad Khairussaleh and Aishah Najiah Danhel Malaysia</i></p>	<p>Paper ID: 173 Adapting the LTE Architecture to 5G: Challenges and Possibilities</p> <p><i>MS Alam, MN Uddin, ZI Roni, S Ahammed, MS Islam, N Haque, MR Rana, MM Rahman, Z Mahabub, Rupal Roy and MM Rashid Bangladesh</i></p>
10.40 – 11.00	<p>Paper ID: 114 Effects of Silver Nanoparticles Concentration on Resistivity of PEDOT: PSS Thin Conductive Films</p> <p><i>Zuraida Ahmad, Udaimatunnoor Azmy, Amelia Wong Azman, Nur'Aishah Ahmad Shahrin and Fawwaz Eniola Fajingbesi Malaysia</i></p>	<p>Paper ID: 179 An Experimental Investigation on Drilling of Aluminum Alloy (Al7075) Using High Speed Steel Cutting Tools</p> <p><i>Nor Farah Huda Abd Halim, Aishah Najiah Dahnel, Azwa Azmariza Ismail and Nur Amanina Mohd Zainudin Malaysia</i></p>	<p>Paper ID: 156 Contradiction Matrix Applied to Value Analysis Value Engineering (VAVE)</p> <p><i>Ainul Farahin Abdullah Malaysia</i></p>

11.00 – 11.20	<p>Paper ID: 165 The Effects of Glycerol Addition on Mechanical Properties of Thermoplastic Films Based on Mango Seed Starch</p> <p><i>Nur'Aishah Ahmad Shahrim, Norshahida Sarifuddin, Noorasikin Samat and Hafizah Hanim Mohd Zaki</i> Malaysia</p>	<p>Paper ID: 155 The Effect of Cutting Parameters on Tool Wear in Drilling Aluminium 7075</p> <p><i>Nur Munirah Meera Mydin, Aishah Najiah Dahnel, Natasha A. Raof, Nor Khairusshima Muhammad Khairussaleh and Suhaily Mokhtar</i> Malaysia</p>	<p>Paper ID: 157 Design Optimization of Lightweight Lower Control Arm using Finite Element Method</p> <p><i>Rosdi Daud, Abdalrhman Adnan Almor, Mas Ayu Hassan, Muhammad Safwan Sallehfi'I, Siti Haryani Tomadi and Arman Shah Abdullah</i> Malaysia</p>
11.20 – 11.40	<p>Paper ID: 177 Effect of Epoxidized Palm Oil (EPO) on Mechanical Properties of Polyhydroxylalkanoates (PHA)</p> <p><i>Muhammad Sufi Iqbal, Norita Hassan and Noor Azlina Hassan</i> Malaysia</p>	<p>Paper ID: 117 Investigation of Vibration in Micro Milling with MQL : S/N Ratio Analysis</p> <p><i>Muhammad Shaffiq Hussin, Mohammad Yeakub Ali, Asfana Banu, Mohamed Abd. Rahman and Md. Sazzad Hossien Chowdhury</i> Malaysia</p>	<p>Paper ID: 150 Study on Low Velocity Impacts on Empty Fruit Bunch (EFB) Composite by Using Finite Element Analysis Software LS-DYNA</p> <p><i>Intan Irieyana Binti Zulkepli and Hanan Bin Mokhtar</i> Malaysia</p>
11.40 – 12.00	<p>Paper ID: 105 Effect of SiC Particle Size on Hardness and Wear Behavior TIG Melted Hard Surface Layer AISI Duplex-2205 Steel</p> <p><i>Lailatul Harina Pajjan, Md Abd Maleque and Suryanto</i> Malaysia</p>	<p>Paper ID: 178 Mechanical and Structural Properties of the Butt Welded Joint in High Strength Structural Steel (ST52-3) Using Gas Metal Arc Welding and Oxyfuel Gas Welding</p> <p><i>Tasnim Firdaus Mohamed Ariff and Osamah Omar Alqwairi</i> Malaysia</p>	<p>Paper ID: 172 The Performance Analysis of PID Controller for Rehabilitation by Using Dynamic Model</p> <p><i>Rupal Roy, MM Rashid, Maidul Islam, Julkar Nayen, Anik Paul and Norsinnira Zainul Azlan</i> Malaysia / Bangladesh</p>
12.00 – 12.20	<p>Paper ID: 176 Anodized Nano-coating of Copper Material for Thermal Efficiency Enhancement</p> <p><i>M H Mahmood and M A Maleque</i> Malaysia</p>	<p>Paper ID: 127 Investigation on Pullout Strength between Different Design of Cannulated Pedicle Screw and Osteoporosis Bones to Obtain an Optimum Design</p> <p><i>Rosdi Daud, Muhammad Amir Asyraf Abdul Mubin, Mas Ayu Hassan, Arman Shah and Siti Haryani Tomadi</i> Malaysia</p>	<p>Paper ID: 115 Allium Sativum as Antimicrobial Agent in Thermoplastic Sago Starch (TPSS) Films for Dermal Wound Healing</p> <p><i>Fathin Iliana Jamhari, Zuraida Ahmad, Maisarah Tajuddin and Nader Abuhamed</i> Malaysia</p>
13.00 - 14.00	<p>Lunch Venue: Pot and Pan Restaurant</p>		

Parallel Technical Sessions 3, Thursday, 31 October 2019: 14.00 – 15.20			
Time	Chairperson: Assoc. Prof. Dr. Hadi Purwanto Co-Chair: Dr. Norhuda Hidayah Nordin Venue: Hall 2A (ADVANCED & SUSTAINABLE MATERIALS)	Chairperson: Dr. Shafie Kamaruddin Co-Chair: Dr. Nor Khairusshima Muhammad Khairussaleh Venue: Hall 2B (SMART MANUFACTURING)	Chairperson: Assoc. Prof. Dr. Maizatunisa Othman Co-Chair: Dr. Syazwani Mohd Zaki Venue: Hall 2C (ADVANCED & SUSTAINABLE MATERIALS)
14.00 – 14.20	<p>Paper ID: 128 Thermal Oxidation Promotes Growth of Nanocrystalline Diamond on Biomedical Grade Co-Cr-Mo Alloy</p> <p><i>H. Mas-Ayu, S Izman, Rosdi Daud, A. Shah, Siti Haryani Tomadi and M. S. Dambatta</i> Malaysia</p>	<p>Paper ID: 139 Integrating TRIZ (Theory of Inventive Problem Solving) Into Value Analysis Value Engineering (VAE) Methodology</p> <p><i>Ainul Farahin Abdullah</i> Malaysia</p>	<p>Paper ID: 148 Performance of Nano Silica as Modified Binder to Improve Rutting and Fatigue Resistance</p> <p><i>Khairil Azman Masri, Ahmad Kamil Arshad, Ramadhansyah Putra Jaya, Haryati Awang, Mohamad Idris Ali, Ekarizan Shaffie, Juraidah Ahmad And Youventharan Duraisamy</i> Malaysia</p>
14.20 – 14.40	<p>Paper ID:130 New Approach of Municipal Solid Waste (MSW) Leachate Treatment Using Hydrothermal Method</p> <p><i>Siti Salwa Khamis, Hadi Purwanto, Hamzah Mohd Salleh, Mohamed Abd Rahman and Alya Naili Rozhan</i> Malaysia</p>	<p>Paper ID: 124 Development of Transition Decision-Making Framework Towards Remanufacturing: Case Studies in Malaysia Automotive Sector</p> <p><i>Mohd Fakhrrur Razi Misran, Eida Nadirah Roslin, Nurhayati Mohd Nur, Jamel Othman and Nor Aiman Sukindar</i> Malaysia</p>	<p>Paper ID: 149 Performance of Charcoal Coconut Shell Ash in the Asphalt Mixture Under Long Term Aging</p> <p><i>Sajjad Ali Mangi, Ramadhansyah Putra Jaya, Khairil Azman Masri, Youventharan Duraisamy, Ekarizan Shaffie, Norhidayah Abdul Hassan and Mohd Rosli Mohd Hasan</i> Pakistan / Malaysia</p>
14.40 – 15.00	<p>Paper ID: 131 Joining of Aluminium Metal Matrix Composites Using Friction Welding – Review, Insights and Future Directions.</p> <p><i>Mutlag Shafi Fuhaid, Pradeep K Krishnan,</i></p>	<p>Paper ID: 167 Development and Investigation of an Impedance Controller for Shoulder Rehabilitation</p> <p><i>Rupal Roy, Julkar Nayen, M M Rashid,</i></p>	<p>Paper ID: 151 Experimental Study on Empty Fruit Bunch (EFB) Composite Subjected to Three Points Bending Using ANOVA Technique</p>

	<i>Md Abdul Maleque, Murali R V and Mohammad Yeakub Ali</i> Malaysia / Oman	<i>Maidul Islam, Norsinnira Zainul Azlan and Saiful Islam</i> Malaysia / Bangladesh	<i>Intan Irieyana Binti Zulkepli and Hanan Bin Mokhtar</i> Malaysia
15.00 – 15.20	Paper ID: 175 Reprocessing of Polypropylene/Cellulose Composites: Effects on Thermal Properties <i>Noorasikin Samat, Norshahida Sarifuddin and Muhd Izzudin Shafiee</i> Malaysia	Paper ID: 164 Vibration Analysis of Forming Tool and Thin Sheet Metal in Robot-Based Single Point Incremental Sheet Forming <i>Nazarul Abidin Ismail, Mohd Idris Shah Ismail, Azizan As'array, Mohd Khairol Anuar Mohd Ariffin</i> Malaysia	Paper ID: 174 A Review of Current Prediction Methods for Slagging and Fouling in Malaysian Coal Fired Power Plants <i>Zaki Anhar, Mukhtaruddin Musa, Suhaimi Illias and Mohd Hanafi Ani</i> Malaysia
15.40 – 16.00	Best Papers Awards and Closing Session		Venue: Hall 1
16.00 - 16.30	Refreshment		Venue: Foyer (Hall 2, 3, 4)

VISIT MALAYSIA – 2020



With the land size of 329,758 sq km, the Federation of Malaysia comprises of Peninsular Malaysia and the states of Sabah and Sarawak on the island of Borneo. Located between 2° and 7° north of the Equator, Peninsular Malaysia is separated from the states of Sabah and Sarawak by the South China Sea. To the north of Peninsular Malaysia is Thailand while its southern neighbor is Singapore. Sabah and Sarawak are bounded by Indonesia while Sarawak also shares a border with Brunei.

Malays who make up about 57% of the 25 million populations are the predominant group in Malaysia, with Chinese, Indians and other ethnic groups making up the rest. Bahasa Melayu (Malay) is the national language, but English is widely spoken. The ethnic groups also speak various languages and dialects. The official religion in Malaysia is Islam, but all other religions are freely practiced.

Malaysia is blessed with a tropical climate with warm weather all year round. The temperatures ranged from around 21°C (70°F) to 32°C (90°F), and the annual rainfall varies from 2,000mm to 2,500mm. Manufacturing constitutes the largest single component of Malaysia's economy. Tourism and primary commodities such as petroleum, palm oil, natural rubber, and timber are other major contributors to the economy.

Malaysia is divided into Peninsular Malaysia (West Malaysia) and East Malaysia. The capital, Kuala Lumpur, lies midway along the West Coast of Peninsular Malaysia. Kuala Lumpur represents the heartbeat of Malaysia, serving as its administration, cultural, commercial and transportation center. It all began in the Middle of the 19th century when a group of tin prospectors came to settle around the convergence of the Klang and Gombak rivers. This marked the foundation of Kuala Lumpur, and it has been its share of growth and setbacks to become the metropolitan center of today. With a population of over 1.3 million, Kuala Lumpur is by far the largest city in Malaysia. Malays, Chinese and Indians comprise the main races among others in this multicultural backdrop. This ethnic diversity has shaped the city over the years and is seen in the various cultural customs and religious beliefs, as well as languages, cuisines, and architecture. Better known as KL to the locals, the city is a heady mix of history and culture intertwined with mushrooming skyscrapers and office towers. Kuala Lumpur is one of the best examples of a city that has managed to preserve the best of its cultural heritage and combine it with modern conveniences to offer a wholly unique experience to visitors.

INTERNATIONAL ISLAMIC UNIVERSITY MALAYSIA (IIUM)



IIUM was established in 1983 to fulfill one of the major aspirations of the contemporary global Muslim community. This yearning of the Ummah is a key element in IIUM's vision statement: "To become a leading international center of educational excellence which seeks to restore the dynamic and progressive role of the Muslim Ummah in all branches of knowledge and intellectual discourse."

IIUM operates under the direction of a Board of Governors with representatives from the eight sponsoring governments and the Organization of Islamic Conference (OIC). Currently, IIUM is home to over 26,000 students (20,000 undergraduates and 6,000 Postgraduates) students including students from more than 117 countries and 3,000 teaching and administrative staff members.

The university's current physical facilities are located at five sprawling campuses in Gombak, Kuala Lumpur, Kuantan, Gambang and Pagoh. This was a far cry from its humble beginnings in 1983 when it operated from temporary quarters with 153 students and a handful of lecturers and administrators.

IIUM offers a wide range of academic programs through its faculties of Science, Laws, Medicine, Engineering, Islamic Revealed Knowledge and Human Sciences, Economics and Management, Nursing and Allied Health Sciences and Architecture and Environmental Design. These are geared towards both skill-building and scholastic attainments and designed by IIUM's philosophy, which is built upon the belief that knowledge must be pursued and propagated in the spirit of tawhid, as an act of worship, in full recognition that it is a trust which Allah has placed upon mankind. Malaysian graduates of IIUM have performed well in both the public and private sectors. Since 1987 IIUM has been producing about 3,000 graduates annually.



Website: <http://www.iium.edu.my>

KULLIYAH OF ENGINEERING, IIUM



The mission of the Faculty of Engineering is to provide quality engineering education, with sufficient scope to include fundamental and specialized knowledge and practice in engineering and a broad base in management, ethics, and humanities. This will enable our graduates to be ready to serve the current and emerging needs of the society.

Besides being professionally qualified and competent, the graduates will acquire spiritual, intellectual, moral and ethical characteristics towards the development of an integral and harmonious relationship with Allah (the creator), fellow human beings and with the natural environment. The interdisciplinary approach to engineering education not only allows the graduates to solve industrial and human problems; it will also enable them to bring about and manage changes in conformity with the worldview based on the principles of Islam.

Currently, there are nine programs being offered: Aerospace Engineering, Automotive Engineering, Biotechnology Engineering, Civil Engineering, Communication Engineering, Computer and Information Engineering, Manufacturing Engineering, Materials Engineering, and Mechatronics Engineering. The faculty is also offering postgraduate engineering programs leading to MSc. and Ph.D. degrees. At the moment the student population at the undergraduate level stands at 1981 with 200 students at the postgraduate level.

Research and development are one of the primary activities in the Faculty of Engineering, and there are excellent facilities, qualified and competent academic staff, and conducive environment which enhance active participation in research activities in various fields of Engineering. To foster research collaboration amongst faculty members, research units and research groups have been established. Presently, there are three research units and fifteen research groups which span various areas of engineering, encompassing both conventional and emerging fields. There are also well equipped Advanced Laboratories to support research and development activities and postgraduate studies. The Faculty of Engineering offers Ph.D. and Masters degree programs. The Ph.D. program is by research whereas the Master degree program is conducted in three modes, namely, research only, mixed mode (equal number of credits for both courses and research), and courses only. It offers eight master programs in the following areas: Automotive Engineering, Biotechnology Engineering, Communication Engineering, Computer and Information Engineering, Electronic Engineering, Manufacturing Engineering, Material Engineering, Mechatronics Engineering.

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