



**LEADING THE WAY**  
KHALIFAH - AMĀNAH - IQRA' - RAHMATAN LIL-ĀLAMĪN  
**LEADING THE WORLD**



AN INTERNATIONAL AWARD-WINNING INSTITUTION FOR SUSTAINABILITY

*IN CONJUNCTION WITH IIUM 40<sup>TH</sup> ANNIVERSARY*

# IIUM ENGINEERING CONGRESS 2023

**15-16 AUGUST 2023**  
**HYBRID MODE**  
**KUALA LUMPUR, MALAYSIA**



**ICCCE 2023**



**ICCHES 2023**



**ICMAAE 2023**



**ICEPEE 2023**

Organized by: **KULLIYAH OF ENGINEERING**



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## MESSAGE FROM THE PRESIDENT

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**YBhg. Tan Sri Samsudin Osman**

President

International Islamic University Malaysia

*Assalamu 'alaikum wrt. wbt.*

A very warm welcome to all participants of the IIUM Engineering Congress 2023 (IEC'23).

This event marks a significant milestone in our academic journey, as we come together to celebrate the remarkable achievements and advancements in the field of engineering.

This year the IIUM Engineering congress features four conferences in different fields of Engineering, namely, the 6<sup>th</sup> International Conference on Mechanical, Automotive and Aerospace Engineering (ICMAAE '23), the 9<sup>th</sup> International Conference on Computer and Communication Engineering (ICCCE 2023), the 6<sup>th</sup> International Conference on Engineering Professional Ethics and Education (ICEPEE '23), and the International Conference on Chemical Engineering & Sustainability 2023 (ICCHES 2023).

Today, as we gather under the theme "Engineering for a Sustainable Future", we are reminded of the critical role engineers play in shaping our world. The challenges we face as a global community are unprecedented, from climate change and resource scarcity to rapid urbanization and technological disruption. These challenges demand innovative solutions and a concerted effort to create a sustainable future for generations to come.

At IIUM, we have always recognized the importance of engineering in driving societal progress and addressing pressing global issues. Our engineering programs have consistently produced graduates who possess not only technical competence but also a deep understanding of ethical responsibility and the need to contribute positively to society.

As we embark on this congress, I urge all participants to embrace the spirit of collaboration, exchange of ideas, and intellectual curiosity. This platform serves as an opportunity for us to engage in meaningful dialogue, challenge conventional thinking, and push the boundaries of knowledge. Let us seize this occasion to cultivate interdisciplinary partnerships, foster innovation, and explore new frontiers of engineering.

## MESSAGE FROM THE PRESIDENT

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Together, we can create a better world through our dedication to innovation, sustainability, and ethical engineering practices. I encourage each and every one of you to embrace the challenges that lie ahead, to push the boundaries of what is possible, and to remain committed to the pursuit of knowledge and excellence.

I would like to express my heartfelt gratitude to the organizing committee for their tireless efforts in putting together this exceptional congress IEC'23. Your dedication and commitment to fostering academic excellence and intellectual growth are truly commendable. I would also like to extend my appreciation to the faculty members, industry professionals, and guest speakers for gracing us with their presence and sharing their expertise.

Thank you once again to the organizing committee, the faculty members, the distinguished guests, and all the participants for making this congress a resounding success. May Allah bless our efforts, guide our paths, and grant us success in all our endeavors.

Wassalamualaikum warahmatullahi wabarakatuh.

**Tan Sri Samsudin Osman**

President of International Islamic University Malaysia

## MESSAGE FROM THE RECTOR

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

*Assalamu'alaikum Warahmatullahi Wabarakatuh*

A warm welcome to the IIUM Engineering Congress 2023 keynote speakers and participants.

The main objective of organizing this congress is to provide an international technical forum for engineers, academicians, scientists and researchers to present results of ongoing research in various engineering areas, through the four conferences, namely, the 6<sup>th</sup> International Conference on Mechanical, Automative and Aerospace Engineering (ICMAAE '23), the 9<sup>th</sup> International Conference on Computer and Communication Engineering (ICCCE 2023), the 6<sup>th</sup> International Conference on Engineering Professional Ethics and Education (ICEPEE '23), and the International Conference on Chemical Engineering & Sustainability 2023 (ICCHES 2023). This event serves as a testament to our commitment to academic excellence, innovation, and the pursuit of knowledge in the field of engineering.

The challenges we face as a global society demand innovative solutions, groundbreaking research, and the ability to adapt to a rapidly evolving technological landscape. At IIUM, we take great pride in our engineering programs, which have consistently produced graduates who possess not only technical expertise but also a deep sense of ethical responsibility, social consciousness, and a commitment to serving humanity. Our graduates are equipped with the skills and knowledge needed to address the complex challenges of our time and to contribute meaningfully to the sustainable development of our society.

I would like to express my deepest appreciation to the organizing committee in bringing this congress to fruition. Your hard work has created an exceptional platform for academic discourse, intellectual exchange, and the celebration of engineering achievements.

This congress provides an unparalleled opportunity for students, academics, and industry professionals to come together, collaborate, and share their research findings, innovative ideas, and practical experiences. It is a platform where minds can meet, where new partnerships can be formed, and where interdisciplinary collaborations can flourish.

I encourage all participants to make the most of this congress by actively engaging in discussions, attending the various sessions and workshops, and seizing the chance to learn from the wealth of knowledge and experience present here. This is an opportunity for us to expand our horizons, challenge conventional wisdom, and push the boundaries of what is possible in the field of engineering.

## MESSAGE FROM THE RECTOR

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As we navigate the complex challenges of our time, we must remember that our actions have far-reaching consequences. Our faith teaches us to be mindful of our responsibilities as stewards of the Earth, to strive for justice and fairness, and to seek solutions that uplift society as a whole. Let us be guided by these principles in our pursuit of engineering excellence and innovation.

In conclusion, I would like to extend my heartfelt gratitude to the organizing committee, the faculty members, the distinguished guests, and all the participants for their contributions to this congress 23. Your presence and active engagement demonstrate the collective commitment we share to advance the frontiers of knowledge and to create a better future for all.

May this congress serve as a catalyst for groundbreaking research, meaningful collaborations, and transformative ideas. May it inspire us to strive for excellence, ethical leadership, and responsible innovation. Together, let us engineer a future that is sustainable, inclusive, and in harmony with the values we hold dear.

I wish everyone a good deliberation and discussion and pray to Allah SWT for His blessing and guidance.

*Wassalam,*

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

## MESSAGE FROM THE CONGRESS CHAIRMAN

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**Assoc. Prof. Dr. Sany Izan Ihsan**  
Dean  
Kulliyah of Engineering

*Bismillahirrahmanirrahim*

*Assalamualaikum warahmatullahi wabarakatuh*

It is my utmost pleasure to welcome all participants to the IIUM Engineering Congress 2023 (IEC'23). This year, in conjunction with the IIUM 40th Anniversary celebration, the IIUM Engineering Congress features four conferences in different fields of Engineering. These are 6<sup>th</sup> International Conference on Mechanical, Automative and Aerospace Engineering (ICMAAE '23), the 9<sup>th</sup> International Conference on Computer and Communication Engineering (ICCCE 2023), the 6<sup>th</sup> International Conference on Engineering Professional Ethics and Education (ICEPEE '23), and the International Conference on Chemical Engineering & Sustainability 2023 (ICCHES 2023)

The main objective of organizing this congress is to provide a medium for institutions and industries to share ideas and knowledge, exchange information, innovations, and problem-solving techniques. With our tagline "For Sustainable Future", the Kulliyah strive to play our role, particularly in engineering field, for the betterment and sustainability of future mankind, society, and the world at large. This congress would be a suitable avenue for us to showcase and share our knowledge and findings, besides providing opportunity to expand our networking with colleagues for other places. We are proud to have good expertise in many engineering areas from all around the world and look forward to establishing meaningful collaborations for mutual benefits.

Since Covid-19 have become more manageable and online conference tools have been well established due to the pandemic situation, we decided to organize the congress in hybrid mode for the first time this year. We hope that this approach will provide us with both benefit of giving opportunity for participant from abroad to share their knowledge as well as providing the opportunity to have face-to-face discussions and networking opportunities, that has been missing in the past several years. Of course, we anticipate that conducting hybrid session will find new challenges, but we hope that the event will run smoothly to meet its objectives and all participants will be able to get full benefit.

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 welcome you again to IIUM Engineering Congress 2023.

**Assoc. Prof. Dr. Sany Izan Ihsan**  
Chairman  
IIUM Engineering Congress 2023

## CONGRESS ORGANIZING COMMITTEE

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<b>CHAIRMAN</b>	Sany Izan Ihsan
<b>SECRETARY</b>	Md. Hashim Selamat
<b>SECRETARIAT</b>	Nurhanina Rafa'i Ahmad Halfathuddin Yusof
<b>TREASURER</b>	Siti Zubaidah Mohamed Yusof Yun Eza Mohd. Radzi
<b>CHAIRMAN OF ICCCE 2023</b>	Md. Rafiqul Islam
<b>CHAIRMAN OF ICCHES 2023</b>	Mohammed Saedi Jami
<b>CHAIRMAN OF ICMAAE 2023</b>	Fadly Jashi Darsivan
<b>CHAIRMAN OF ICEPEE 2023</b>	Ani Liza Asnawi
<b>PROMOTION AND WEBMASTER</b>	Wan Mohd. Fazli Wan Nawawi
<b>PUBLICATION</b>	AHM Zahirul Alam
<b>HEAD OF PROGRAMME</b>	Md Zahangir Alam
<b>HEAD OF REGISTRATION</b>	Mohd Farid Aladdin
<b>HEAD OF SOUVENIR</b>	Nurhanina Rafa'i
<b>HEAD OF SPONSORSHIP</b>	Muhammad Saifuddin Mohamed Rehan
<b>HEAD OF AUDIO VISUAL</b>	Mohd Shahnan Zainal Abidin



### KEYNOTE 1

#### **HARMONIZING COMPUTER TECHNOLOGY, AI, AND ETHICAL ENGINEERING FOR A SUSTAINABLE FUTURES**

**Abstract:** This keynote speech explores the intersection of computer technology, AI, and ethical engineering, emphasizing the need to address the ethical considerations that arise alongside technological advancements. It highlights the potential risks and benefits of these technologies and emphasizes the importance of ethical decision-making in their design and implementation. The speech emphasizes key principles of ethical engineering, interdisciplinary collaboration, and the role of education in nurturing a culture of ethical engineering. By harmonizing computer technology, AI, and ethical engineering, we can shape a sustainable future that aligns with our shared values and respects fundamental human rights.



**Rafeek Ibrahim** is a distinguished professional known for his remarkable contributions to the fields of engineering and management. With a diverse educational background and extensive experience in various leadership roles, he has made a significant impact on the global stage.

Rafeek's journey began with a solid academic foundation. He completed his undergraduate studies in Engineering, specializing in solid state physics. Driven by his passion for knowledge, he pursued a master's degree in the same field, delving deeper into the intricacies of solid state physics. However, he didn't limit himself to technical expertise alone. Recognizing the importance of business acumen in today's fast-paced world, Rafeek enrolled in an executive education program at Harvard Business School, focusing on data analytics, a crucial skill in the digital age.

Rafeek's professional career commenced in the field of IP Validation Engineering, where he honed his skills in ensuring the integrity and functionality of intellectual property. His expertise soon expanded to encompass Power Management, an area vital for optimizing energy usage and efficiency. With his extensive knowledge and experience in Power and Performance, Rafeek emerged as a subject matter expert in these domains.

Demonstrating his adaptability and leadership prowess, Rafeek held leadership positions in large engineering organizations across different countries. His expertise was sought after in the United States, Singapore, and Malaysia, where he led diverse teams of engineers and researchers. Through his strategic vision and effective management, Rafeek successfully steered these organizations towards groundbreaking achievements in research and development, as well as operational excellence.

As a testament to his contributions to the scientific community, Rafeek has published technical papers in prestigious journals such as IEEE and Springer. His research and findings have been shared and recognized in international conferences, further solidifying his reputation as an authority in his field. Moreover, Rafeek's commitment to innovation has resulted in the granting of two patents in the United States, highlighting his inventiveness and ability to translate ideas into tangible solutions.

Rafeek's dedication to fostering growth and knowledge extends beyond his own accomplishments. He actively participates as a mentor in the Intel Global Mentor Circle mentorship program, where he imparts his wisdom and guidance to senior leaders. Recognizing the importance of diversity and inclusion, Rafeek represents Malaysia in a global forum aimed at advocating for these values. As a member of the Intel Disability Leadership Council, he strives to create an inclusive environment that celebrates the unique contributions of individuals with disabilities.

In addition to his impressive professional achievements, Rafeek also serves as a consultant to the

government, providing expertise on the Nation Robotics Roadmap. His valuable insights contribute to shaping policies and strategies in the field of robotics, furthering the nation's technological advancements. Moreover, Rafeek holds an advisory role at the Economic Planning Unit, where he helps shape R&D policies that drive innovation and economic growth.

Recognized for his expertise and leadership, Rafeek sits on the University Advisory Board for multiple universities globally. His involvement in these esteemed institutions allows him to contribute to educational and research initiatives, providing guidance and insight to shape the future workforce in engineering and technology.

Throughout his career, Rafeek Ibrahim has seamlessly blended his technical expertise with his management skills, making him a trailblazer who bridges the gap between engineering and business. His commitment to research and development, combined with his strategic leadership, has paved the way for innovation and growth in the organizations he has led.

## KEYNOTE 2

### **THE TREND AND IMPACT OF COMPUTER TECHNOLOGIES TO TELECOMMUNICATION**

**Abstract:** With the advancement of computer technologies, we see the increasing capabilities of telecommunication to connect, serve and impact lives of individuals and businesses. We will take a quick look on how we got here, and what impact has it made. Also looking forward, what we would be expecting computer technologies to have impact on how we deliver and use telecommunication.



**Tan Cheng Peng**, the Acting Chief Technology Strategy Officer, Maxis, is accountable for our technology strategy roadmap to ensure technology and network leadership in anticipation of industry trends and direction, with the right and optimum technologies, network features, capabilities, architecture to meet our current and future needs. He leads a team of technologists to develop technology strategy and long range network plan along the vectors of innovation, service quality, business objectives and customer experience by ensuring right technology & investment at the right time and right place with the view to increase network efficiency and performance while minimise cost, rework and single point of failure.

## **KEYNOTE 3**

### **MALAYSIA RENEWABLE ENERGY ROADMAP**

**Abstract:** Moving forward, Malaysia aims to achieve a higher RE growth, from the existing 23% or 8.45 GW RE in its power installed capacity. Malaysia Renewable Energy Roadmap (MyRER) projected to increase the share of RE to 31% or 12.9 GW in 2025, and 40% or 18.0 GW in 2035. The RE Initiatives under this roadmap are expected to support Malaysia's commitment to greenhouse gas (GHG) emission reduction under the Paris Agreement led by the United Nations Framework Convention on Climate Change (UNFCCC). Malaysia's global climate commitment is to reduce its economy-wide carbon intensity (against GDP) of 45% in 2030 compared to 2005 level. Realization of the Government's vision is crucial in supporting the nation to achieve its Nationally Determined Contributions (NDC) targets. This talk will describe the identified resource potential, strategies, key actions, opportunities, current and future scenarios.



**Mr. Saiful Hakim bin Abdul Rahman**, has been in the utility and energy related business for over 28 years. He started his career with Distribution TNB scholar and served the distribution division for 17 years which provides him with vast experience in Distribution Network business. He then moved to United Kingdom and worked with Scottish and Southern Energy (SSE), one of the big 6 utilities in the UK based in Glasgow. Whilst in SSE, he was involved in Business Planning, Regulatory Reporting and Compliance, Asset Management and supporting the grid connections for Renewable Energy under the Transmission business. He worked closely with OFGEM, the Regulator for the UK utilities during that period in developing the Regulatory Reporting for the RIIO-T1 Regulatory Period. He developed his interest and enthusiasm on Renewable Energy whilst working there. Later he joined Landis+Gys AG, a Swiss based energy management company developing business on energy management solution such as smart metering and smart grid. Mr. Saiful Hakim obtained his Bachelor of Engineering in Electrical & Electronic Engineering from University of Brighton, United Kingdom in 1993 and MBA (Strategic Management) from Aston University, United Kingdom in 2011. During his MBA time he also attended Audencia Business School, Nantes in France for lectures.

## KEYNOTE SPEAKERS ICCHES 2023

### DECOLONIZATION TECHNOLOGIES FOR THE NATURAL GAS PROCESSES AS THE TRANSITION ENERGY SOURCE

**Abstract:** Gas to Liquid (GTL) conversion of natural gas to synthetic fuels (Syncrude) expands the value-chain of natural gas utilization where plants like the Bintulu and the Pearl GTL plants are typical cases. However, the CO<sub>2</sub> emissions from GTL processes, estimated at 314 kgCO<sub>2</sub>/bbl. Syncrude, negatively impact the carbon footprint of the ultra-clean fuels produced from the GTL plant. Natural gas reforming is the first-step in the GTL plant and emits up to 60% of the CO<sub>2</sub> emission of the entire process. Therefore, decarbonization of the reforming process is imminent to reduce the CO<sub>2</sub> footprint of the GTL products. CARGEN-based reformer unit demonstrated a 40% reduction in CO<sub>2</sub> footprint compared to the benchmark reforming processes and is therefore considered an attractive candidate for decarbonizing the GTL and other chemical process plants. CARGEN-based reformer comprises two integrated reactors that sequentially convert natural gas and CO<sub>2</sub> to multi-walled carbon nanotubes (MWCNTs) and downstream compatible syngas. The co-production of MWCNTs presents significant economic incentives unmatched by the benchmark reforming processes while bringing CO<sub>2</sub> sustainability. In this work, we present a retrofitting case study of state-of-the-art Autothermal Reformer (ATR)-based GTL plant that produces 50,000 bbl./day of Syncrude using CARGEN-based technology. We demonstrate that the implementation of the CARGEN technology results in a net CO<sub>2</sub> emission of 84 kg CO<sub>2</sub>/bbl. Syncrude, which is a 73% reduction compared to the 314 kg CO<sub>2</sub>/bbl. emission of the ATR-based GTL plant. CARGEN implementation also requires a 79% less oxygen than the ATR-based GTL plant. Also, the additional functionality of CO<sub>2</sub> abatement results in the co-production of 243 kg MWCNTs/bbl., however, at a 61% higher methane requirement. Nevertheless, our comprehensive economics assessment entails the opportunity for 1.2 M USD/day additional revenue generation upon CARGEN implementation. Ultimately, the outcome of this study encourages CARGEN-based chemicals and refinery plants that co-produces syngas, hydrogen, and MWCNTs from CO<sub>2</sub> and natural gas as an integrated decarbonization solution.

#### **Prof. Nimir Elbashir**

Texas A&M University, Qatar



**Professor Elbashir** holds a joint appointment as a professor in the Chemical Engineering Program and the Petroleum Engineering Program at Texas A&M University at Qatar. He is the director of Texas A&M's Engineering Experiment Station Gas and Fuels Research Center (GFRC), a major research center involving 30 faculty members from the College Station and Qatar campuses of Texas A&M University (<http://gfrc.tamu.edu/>). He has extensive research and teaching experience from four countries worldwide, including his previous position as a researcher at BASF R&D Catalysts Center in Iselin, New Jersey. His research activities focus on designing advanced reactors, catalysts, and conversion processes for natural gas, coal, and CO<sub>2</sub> to ultraclean fuels and value-added chemicals. He has established several unique global research collaboration models between academia and industry, with research funds exceeding thirteen million dollars during the past eight years. He holds several U.S. and European patents and many scientific publications in peer-reviewed journals, conference papers, technical industry reports, and invited talks and conference presentations. The scholarship of his research activities has been recognized by awards from the Qatar Foundation, BASF Corp., Texas A&M University Engineering Experiment Station, Texas A&M University Qatar, the American Institute of Chemical Engineers, Shell, ORYX GTL Co., and others. Professor Elbashir has been elected as a member of the Sudanese National Academy of Sciences (SNAS) since 2022.

# KEYNOTE SPEAKERS ICMAAE 2023

## KEYNOTE 1

### INNOVATING IN MALAYSIAN INDUSTRIAL ECOSYSTEMS

#### Abstract:

Innovating in Malaysian industrial ecosystems involves a combination of government support, industry-academia collaboration, technology adoption, sustainable practices, industry clustering, startup ecosystem, and skills development. These elements work together to enhance competitiveness, promote sustainable growth, and ensure the country's industrial sectors remain at the forefront of innovation.



#### **Mr. Naguib Mohd Nor**

BEng. Aerospace Engineering - UMIST, MSc. Aerospace Vehicle Design – Cranfield.

Naguib is CEO of Strand Aerospace Malaysia and President of Malaysia Aerospace Industry Association (MAIA). Naguib holds a BEng. Aerospace Engineering from UMIST and a MSc. Aerospace Vehicle Design from Cranfield. He began his career growing a UK aerospace start-up, and then returned to Malaysia to build Strand Aerospace Malaysia into an organisation leading the design and analysis engineering services industry in Malaysia. Naguib has been active as an engineer, technologist and business developer in the global aerospace supply chain since 2000. He speaks frequently on aerospace and other technology subjects at global events. His deep understanding of technology comes through his 20 years' experience as an aerospace engineer supporting the design and development of commercial aircraft and aerospace companies.

## **KEYNOTE 2**

### **RESEARCH TRENDS IN SUSTAINABLE MOBILITIES**

#### **Abstract:**

Air pollution and climate change are significantly affected by the increase of greenhouse gases produced by burning fossil fuels. The transportation or mobility sector is considered the primary source of these emissions. Policymakers have imposed stricter legislation to reduce greenhouse gas emissions and implement new energy mobilities such as battery electric vehicles, fuel cell vehicles, and hydrogen internal combustion engine vehicles. For example, the European Parliament has agreed to ban new fossil fuel sales beyond 2030. The demand for cleaner and sustainable mobility has driven a drastic change in the way how mobilities are functioning today. However, the new energy mobilities pose several challenges such as range anxiety, lack of charging infrastructure, vehicle costs, and charging time, that are interrelated to each other. Many automotive manufacturers and researchers have developed more innovative system designs and solutions. In this topic, the trends in future mobilities will be covered to understand the research opportunities that can help to achieve the net zero emissions target.



#### **Dr. Raja Mazuir Shah**

Associate Dean, College of Engineering, University of Doha for Science and Technology, Qatar.

Dr. Raja Mazuir Shah is an Associate Dean at the College of Engineering, University of Doha for Science and Technology, Qatar. Dr. Mazuir has been working in academia and industry research settings in Automotive Engineering for more than 27 years, for example, Warwick University UK, Coventry University UK, Sakarya University Turkiye, Lotus Engineering UK, Arrival Limited UK. Dr. Mazuir has also collaborated with external stakeholders such as Jaguar Land Rover UK, Aston Martin Lagonda UK, and Bladon Jets UK to develop innovative solutions for propulsions and energy management systems. Dr. Mazuir is currently working on several research clean mobility projects to develop a sustainable and renewable green hydrogen EV charging infrastructure, a novel lithium-ion battery thermal management system for energy and thermal optimisation, a sustainable mobility system, and advanced sustainable mobility design and testing facilities. Dr. Mazuir was a visiting academic at Cranfield University, UK and Universiti Teknologi Petronas, Malaysia. Dr. Mazuir has published his works in high-impact journals and conferences.

## KEYNOTE SPEAKERS ICEPEE 2023

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### KEYNOTE 1

## ENGINEERING EDUCATION AND ETHICS TOWARDS SUSTAINABLE SOCIETY

**Prof. Emeritus Tan Sri Dato' Dzulkipli Abdul Razak**

Rector, International Islamic University Malaysia, Malaysia



**Abstract:** Education for Sustainable Development has been adopted globally as the overarching framework to transform education holistically in shaping the society of the future. It integrates the 3Ps of People, Planet and Prosperity in a balanced and harmonious way. In short, the same applies to the discipline of engineering. Taking into account transdisciplinary, inclusive as well as indigenous approaches to realise a sustainable society. The presentation will explain on how this could be systematically achieved.



## KEYNOTE 2

### **PREPARING STUDENTS FOR INDUSTRY: BRIDGING THE GAP BETWEEN ACADEMIA AND THE REAL WORLD**

**Prof. Dr. Abdel Magid Hamouda**

Professor, College of Engineering, Qatar University



**Abstract:** In an ever-evolving technological landscape, the dynamic role of engineering education in preparing industry-ready graduates has gained paramount importance. The journey to bridge the gap between academia and the real world, aligning graduate attributes and skills with industrial needs, is influenced by various challenges and barriers. The involvement of industry professionals in curriculum design infuses programs with pertinent skills, technologies, and practices. Experiential learning, internships, and collaborative activities reveal profound insights to student about industries.

Industries are undergoing rapid transformations driven by technological breakthroughs and market dynamics. Automation, artificial intelligence, renewable energy, sustainable practices, and digitalization are reshaping the landscape of various sectors. By aligning with industry needs, universities ensure their engineering programs reflect these changes, enabling students to acquire the latest technical skills and knowledge. Graduates with up-to-date expertise become more relevant and valuable to employers, positioning themselves for career success.

Introducing the concept of innovation in engineering education as a bridge between academia and industry is crucial. The presentation will highlight methodologies such as project-based learning, problem-based learning, flipped classrooms, and experiential learning. Examples showcasing how these approaches engage students in practical, real-world scenarios, fostering critical thinking, collaboration, and problem-solving will be presented and discussed. The design of innovative classrooms that include space design (hubs) for experiential and hands-on learning mirroring industry landscapes is essential for foster critical thinking.

The presentation is also delves into the pivotal role of soft skills in graduate employability, such as communication, adaptability, and leadership. Integrating these skills into the curriculum empowers graduates to manage not just the details of their technical subjects, but also the complexities of different work environments. It will also illustrate the benefits of incorporating real-world projects within the curriculum, showcasing a successful projects that effectively embed and nurture the skills and attributes needed for students to excel in the real world.

The presentation will explore how fostering an entrepreneurial mindset can encourage innovation and adaptability among engineering graduates, and how to foster an entrepreneurial and innovative ecosystems within universities.

The presentation delves into the significant influence that accreditation holds on the employment prospects of university engineering graduates. The presentation will present and discuss how university ranking often hold a reputation for offering quality education and producing skilled graduates. Employers may prioritize graduates from top-ranked universities due to their perceived higher competence.

Finally, looking toward the future, universities act as navigators. Their curricula must serve as a map, equipping graduates with the skills required to navigate this AI-driven job market.

### KEYNOTE 3

## RESEARCH IN ENGINEERING EDUCATION FOR TEACHING EXCELLENCE CAREER PATHWAY

**Prof. Dr. Fatin Aliah Phang Abdullah**

Professor, Universiti Teknologi Malaysia, Malaysia



**Abstract:** When the Ministry of Higher Education launched the Malaysia Education Blueprint 2015-2025 (Higher Education), one of the shifts is to achieve Talent Excellence. To support this shift, MOHE published the Orange Playbook to introduce the Differentiated Career Pathways for the promotion of academics. This opens up a few niches for academics to focus in developing their academic careers such as Teaching & Learning, Research, Professional Services and Leadership. Engineering educators at higher education institutes are given the opportunities to venture further into teaching, curriculum development, research in engineering education and engineering education related conferences and awards as a new pathway towards career promotion. This keynote will introduce

the teaching excellence framework by the Royal Academy of Engineering as a foundation for engineering educators in planning their career towards the teaching & learning pathway. The keynote will also cover various levels of engineering educators ranging from good practices in teaching to conduct rigorous research in engineering education.

## IEC 2023 OPENING SESSION

15<sup>th</sup> AUGUST TUESDAY 2023

**Registration:** 08.00 – 09.00 am

**Venue:** Audi A, Block E2

Kulliyyah of Engineering

### **Opening Ceremony: 09.00 – 10.00 am**

9.00 am - 9.20 am: MC Opening Remarks/Quran Recitation

9.20 am – 9.25 am: Welcoming remarks by the Chairman of IEC 2023

**Assoc. Prof. Dr. Sany Izan Ihsan, Dean, Kulliyyah of Engineering**

9.25 am – 9.40 am: Opening Speech and Launching Ceremony by the  
IIUM President

**YBhg.Tan Sri Samsudin Osman**

**TEA BREAK: 9.45 – 10.15 am**

**ICEPEE Keynote Speaker: 10.15 – 11.15 am**

Keynote Speaker:

**Prof. Emeritus Tan Sri Dato' Dzulkifli Abdul Razak**

Title:

**Engineering Education and Ethics Towards Sustainable Society**

**Venue:** Audi A, Block E2, Kulliyyah of Engineering

**Chair:** Assoc. Prof. Dr. Ali Sophian

**SPLIT INTO THE CONFERENCES: 11.30 am-1.00 pm**

**LUNCH: 1.00-2.00 pm**



**9<sup>th</sup> International Conference  
on Computer and  
Communication Engineering**

**ICCGCE 2023**

## MESSAGE FROM THE CHAIRMAN OF ICCCE 2023



**Prof. Dr. Md Rafiqul Islam**

*Assalamualaikum warahmatullahi wabarakatuh,*

I would like to extend my warmest welcome to the participants of the 9<sup>th</sup> International Conference on Computer and Communication Engineering 2023 (ICCCE 2023) organized by the Department of Electrical and Computer Engineering (ECE), Faculty of Engineering, International Islamic University Malaysia (IIUM). The Department and the Faculty have been encouraged to organize bi-yearly ICCCE conferences by the enthusiasm and participation in the previous conferences which drawn from around the world. Our aim in establishing ICCCE series of IEEE supported and Scopus indexed conferences is to make it a landmark in the field of Computer and Communication Engineering, which provides a healthy atmosphere for intellectual exchange of thoughts and sharing of research findings among fellow colleagues, researchers, policy makers and students. The theme of the present conference is "Engineering Research for a Sustainable World".

The past ICCCE conferences, as well as the current one, has followed a strict regime of IEEE guidelines of blind-review process seconded by the experienced technical committee scrutiny to update the papers based on reviewers' comments and to comply with the template guidelines. The ICCCE2023 conference has achieved acceptance rates of around 71% out of 110 full paper submissions through EDAS from around 20 countries.

I would like to express my sincere gratitude to the organizing committee and everybody who has worked very hard to make this conference a reality and a success. I would like to express my deepest gratitude to the distinguished keynote speakers, International Advisory Board members and sponsors. I am also grateful to all the reviewers, as without their effort the high-quality standard for the conference could not have been maintained.

I wish all of you a pleasant hybrid experience and we hope that ICCCE 2023 will be a successful and enjoyable event for all participants. I would like to express my gratitude to the participants, members of the organizing committee, secretarial staff, and everyone who have worked hard to make this conference into reality. Finally, I hope that ICCCE 2023 will be successful and enjoyable to all participants.

*Wassalam.*

A handwritten signature in black ink, appearing to read 'Md Rafiqul Islam'.

**Prof. Dr. Md Rafiqul Islam**  
**Electrical and Computer Engineering Department**  
**Kulliyah of Engineering**  
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## TECHNICAL SESSION ICCCE 2023

Time	Tuesday, 15 August 2023	Wednesday, 16 August 2023
9:00 am - 9:45 am	<b>O:</b> Opening Ceremony	<b>K2:</b> Keynote 2: The Trend and Impact of Computer Technologies to Telecommunication
9:45 am - 10:00 am	Break and Networking	
10:00 am - 10:45 am	<b>C:</b> <b>CONGRESS KEYNOTE:</b> IIUM Honorable Rector YBhg. Prof. Emeritus Tan Sri Dato' Dzulkifli Abdul Razak	<b>K3:</b> Keynote 3: Malaysia Renewable Energy Roadmap
10:45 am - 11:00 am	Break and Networking	
11:00 am - 12:45 pm	<p style="text-align: center;"><i>11:30 am - 12:30 pm</i></p> <b>K1:</b> Keynote 1: Harmonizing Computer Technology, AI, and Ethical Engineering for a Sustainable Future	<b>3A:</b> AI & Machine Learning 1 / Green Technology & Smart Grid <b>3B:</b> AI & Machine Learning 2 / RF & Microwave Circuits and Devices <b>3C:</b> AI & Machine Learning 3 / Cyber Security & Network Reliability/ Emerging Technologies
12:45 pm - 2:00 pm	Lunch Break	
2:00 pm - 3:45 pm	<b>1A:</b> 5G and Beyond Wireless Communications <b>1B:</b> IoT & Cloud Computing 1 / Power System & Power Electronics <b>1C:</b> 1C: Energy Harvesting and Renewable Energy	<b>4A:</b> AI and Machine Learning 4 / Electronic Communication / Advanced Computing Architectures <b>4B:</b> AI and Machine Learning 5 / Engineering Management <b>4C:</b> Antennas and Propagation / Optical Communications and Photonics
3:45 pm - 4:00 pm	Break and Networking	
4:00 pm - 5:30 pm	<b>2A:</b> Signal and Image Processing <b>2B:</b> IoT & Cloud Computing 2 / Sensor & Actuators <b>2C:</b> Software Engineering	



## TUESDAY, 15 AUGUST 2023

Tuesday, August 15 8:30 - 10:00 (Asia/Kuala\_Lumpur)

OPENING: Opening Ceremony

Tuesday, August 15 11:30 - 12:30 (Asia/Kuala\_Lumpur)

**Keynote 1: Harmonizing Computer Technology, AI, and Ethical Engineering for a Sustainable Futures**

**Venue: Audi A, Block 2, Kulliyah of Engineering & Zoom**

*Mr. Rafeek Ibrahim*, INTEL

**Chair:** Prof. Dr. Othman Omran Khalifa (International Islamic University Malaysia (IIUM), Malaysia)

Tuesday, August 15 2:00 - 3:45 (Asia/Kuala\_Lumpur)

**1A: 5G and Beyond Wireless Communications**

**Venue: E2-1-1 Block 2 Kulliyah of Engineering and Zoom breakout room name: 1A**

**Chair:** Dr. Ahmad Zamani Bin Jusoh (International Islamic University Malaysia (IIUM), Malaysia)

2:00 *Performance Comparison of DPS in NOMA for Different MIMO Antenna Configurations*

Md. Shahriar Sadid and Abdullah Alavi (Metropolitan University, Bangladesh); Moontasir Rafique, Md. Aadnan Farhad and Mohammad T. Kawser (Islamic University of Technology, Bangladesh)

2:15 *Machine Learning Methods for Detecting Anomalies in 6G Networks*

Mamoon Saeed (University of Modern Sciences (UMS), Saudi Arabia); Rashid A. Saeed (Taif University, Saudi Arabia & Sudan University of Science and Technology SUST, Sudan); Abdul Guddoos Gaid (Taiz University, Yemen); Rania A Mokhtar (Taif University, Saudi Arabia); Othman Omran Khalifa (International Islamic University Malaysia (IIUM), Malaysia); Zeinab Ahmed (International Islamic University Malaysia, Malaysia)

2:30 *RIS-Assisted CSIT-Free Data Fusion With Timing Misalignment*

Yaqiong Zhao and Wei Xu (Southeast University, China); Xinquan Ye (Xidian University, China)

2:45 *Design of a Compact Transparent Antenna for 5G Wireless Applications*

Abdullahi Yahye Ahmed and Shakib Abdullahi Osman (SIMAD University, Somalia); Abdulrashid Mumin (SIMAD University, Somalia); Abdirazak Isse Salah, Anisa Ali Hussien and Yusuf Abdirahman Mohamud (SIMAD University, Somalia)

3:00 *Enhanced Single-Shot Beam Training for True-Time-Delay Hybrid Beamforming Architecture*

Mohamd Waeel Hamdy, Mohamed Ahmed Abdelghany and Ahmed Hesham Mehana (Cairo University, Egypt)

3:15 *The Probabilistic Component of Outdoor Radio Propagation Path Loss Models Considering Rain Fade*

Asma Ali Budadal (College of Electrical & Electronics Technology - Benghazi, Libya, Libya & IIUM, Malaysia); Md Rafiqul Islam (International Islamic University Malaysia, Malaysia)

3:30 *Energy Efficient Joint User Association and Power Allocation Using Parameterized Deep DQN*

Amna Mughees (Sunway University, Malaysia); Mohammad Tahir (University of Turku, Finland); Muhammad Aman Sheikh (Cardiff Metropolitan University, United Kingdom (Great Britain)); Angela Amphawan (Sunway University & School of Engineering and Technology, Malaysia); Kian Meng Yap (Sunway University, Malaysia); Md Rafiqul Islam (International Islamic University Malaysia, Malaysia); Mohamed Hadi Habaebi (International Islamic University Malaysia (IIUM), Malaysia)

**1B: IoT & Cloud Computing 1 / Power System & Power Electronics**

**Room:: E2 -1 -2, Block E2 Kulliyah of Engineering & Zoom Breakout room name: 1B**

**Chair:** Assoc. Prof. Dr. S. M. A. Motakabber (International Islamic University Malaysia (IIUM), Malaysia)

2:00 *Real-Time Monitoring and Measurement of Electrical Variables Using IoT*

Roger Salazar, Romel Valencia, Pablo Catota, Cristian Tasiguano and Luis Daniel Andagoya-Alba (Instituto Superior Tecnológico Rumihahui, Ecuador)

- 2:15 *IOTA-MSS: A Pay-Per-Play Music Streaming System Based on IOTA*  
 Mohammed Ibrahim El-hajj (Twente University, The Netherlands); Daniel Melero Martinez (University of Twente, The Netherlands)
- 2:30 *Kindergarten Child Performance Monitoring System*  
 Banuka Rathnayaka, Thisura Rabel, Chamindi Nimesha Namasingha, Dushantha Hettiarachchi and Hansika Mahaadikara (Sri Lanka Institute of Information Technology, Sri Lanka); Sasini Nuwanthika Wellalage (Industry, Sri Lanka)
- 2:45 *A Trust Aware Secure Ant Colony Optimization Based Routing Algorithm for Internet of Things*  
 Afsah Sharmin, Farhat Anwar, S. M. A. Motakabber and Aisha-Hassan A. Hashim (International Islamic University Malaysia, Malaysia)
- 3:00 *Utilizing Voltage Drop Model Analysis to Determine the Optimal Voltage Regulated Distribution Transformer (VRDT) for Grid Feeders (On-site)*  
 Hana Batrisyia Abdul Rahim and Siti Hajar Yusoff (International Islamic University Malaysia, Malaysia); Mohamed Hadi Habaeabi (International Islamic University Malaysia (IIUM), Malaysia); Amir Hisham Hashim (Maschinenfabrik Reinhausen APAC, Malaysia); Saerahany Legori Ibrahim and Nur Syazana Izzati Binti Razali (International Islamic University Malaysia, Malaysia)
- 3:15 *Smart Meter Based on IoT Platform (On-site)*  
 Muhammad Sharir Fathullah Mohd Yunus and Siti Hajar Yusoff (International Islamic University Malaysia, Malaysia); Siti Nadiyah Mohd Sapihie (Petronas Research Sdn. Bhd., Malaysia); Nur Syazana Izzati Binti Razali (International Islamic University Malaysia, Malaysia)
- 3:30 *Design and Evaluation of a High-Performance Extensible DC-DC Converter Integrated With ANN Based MPPT Controller*  
 S. M. A. Motakabber and Khadiza Akter (International Islamic University Malaysia, Malaysia); Ahm Zahirul Alam (International Islamic University Malaysia, Malaysia); Siti Hajar Yusoff (International Islamic University Malaysia, Malaysia)

## Tuesday, August 15 2:00 - 3:15 (Asia/Kuala Lumpur)

### 1C: Energy Harvesting and Renewable Energy

**Room:: E2 -1 -4, Block E2 Kulliyyah of Engineering & Zoom Breakout room name: 1C**

**Chair:** Dr. Mohd Shahrin Abu Hanifah (International Islamic University Malaysia (IIUM), Malaysia)

- 2:00 *Development of Highly Efficient Hybrid Kinetic -Solar Energy Harvesting System*  
 Liew Hui Fang (University Malaysia Perlis & FTKE, Malaysia)
- 2:15 *Implementation and Remote Monitoring of a Photovoltaic Test Bench With and Without Solar Tracking in Equatorial Zones*  
 Miguel Quiñonez-España (Pontificia Universidad Católica del Ecuador Sede Esmeraldas, Ecuador); Cristian Andrés Tasiguanu Pozo (Instituto Superior Tecnológico San Antonio & Pontificia Universidad Católica del Ecuador Sede Esmeraldas, Ecuador); Manuel Nevárez-Toledo (Pontificia Universidad Católica del Ecuador Sede Esmeraldas, Ecuador)
- 2:30 *Self-Power Devices for A Wireless Sensor System Measuring the Shaft Alignment (On-site)*  
 Ai Van Hoang, Gon Yang Kim and Young Chul Lee (Mokpo National Maritime University, Korea (South))
- 2:45 *Modeling of Temperature and Irradiance Effect on Solar Cell Parameters by MATLAB/Simulink and Verification Using Experimental Data*  
 Mohammad Tamjid Hossain Partho (Northern University Bangladesh, Bangladesh); Mohammad Shafiul Alam (Northern University Bangladesh, Malaysia & International Islamic University Malaysia, Malaysia); Muhammad Mahbubur Rashid (IIUM Gombak Malaysia, Malaysia)
- 3:00 *Analysis of Voltage Profile in Micro Grids Isolated by the Insertion of Non-Conventional Generation Plants*  
 Byron Benalcazar (Instituto Tecnológico Universitario Rumiñahui, Ecuador); Pablo Catota and Cesar Andres Minaya (Instituto Superior Tecnológico Rumiñahui, Ecuador); Vicente Astudillo (Instituto Tecnológico Universitario Rumiñahui, Ecuador); Veronica Vergara (Cenace, Ecuador)

## Tuesday, August 15 4:00 - 5:30 (Asia/Kuala\_Lumpur)

### 2A: Signal and Image Processing

Room:: E2 –1 -1, Block E2 Kulliyyah of Engineering & Zoom Breakout room name: 2A

**Chair:** Assoc. Prof. Dr. Ani Liza Bt. Asnawi (International Islamic University Malaysia (IIUM), Malaysia)

#### 4:00 *Vision-Based Monitoring (VBM) for Plant Quality and Control System (On-site)*

Fei Siang Tay (Swinburne University of Technology Sarawak Campus, Malaysia); Yi Lung Then (Universiti Malaysia Sarawak, Malaysia)

#### 4:15 *Signal Restoration With Fractional Transform Sparse Representation and Autoencoder*

Shivani Saxena (Institute of Advanced Research, India); Surbhi Mistry and Nilesh Patel (Institute of Advanced Research, India); Mohendra Roy Action (Pandit Deendayal Energy University, Thailand); Ahsan Zaigam Rizvi (Institute of Advance Research, India)

#### 4:30 *Design and Development of a Semi-Automated Kitchen Waste Composter*

Moshe Coleen Adique and Aaron Jimson Mandap (Ateneo de Manila, Philippines); Maria Leonora Guico and Jan Kevin Albior Galicia (Ateneo de Manila University, Philippines)

#### 4:45 *Acoustic Sensor Module for Mosquito Detection and Classification*

Kim Ramos, John Sebastian Bacabac, Maria Leonora Guico and Jan Kevin Albior Galicia (Ateneo de Manila University, Philippines)

#### 5:00 *Development of U-Net Architecture for Audio Super Resolution (On-site)*

Teddy Surya Gunawan, Muhammad Rusdy Mohd Sarif and Mira Kartiwi (International Islamic University Malaysia, Malaysia); Yasser Asrul Ahmad (IIUM, Malaysia)

#### 5:15 A *Novel Thermal Imaging Dataset for Children's Autism Spectrum Disorder (On-site)*

Melinda Melinda, Ahmadiar Ahmadiar, Maulisa Oktiana, Yunidar Yunidar, Muhammad Shadiq Adi Nugraha and Muhammad Al Lail Qadrillah (Universitas Syiah Kuala, Indonesia)

### 2B: IoT & Cloud Computing 2 / Sensor & Actuators

Room:: E2 –1 -2, Block E2 Kulliyyah of Engineering & Zoom Breakout room name: 2B

**Chair:** Dr. Farah Abdul Rahman (International Islamic University Malaysia (IIUM), Malaysia)

#### 4:00 *Assistive Shopping Tool for the Visually Impaired (On-site)*

Fatin Najihah Ruzani Nashrom, Huda Adibah Mohd Ramli, Norazlina Saidin and Farah Abdul Rahman (International Islamic University Malaysia, Malaysia)

#### 4:15 *Indoor Navigation and Mapping for Wheelchair People in KOE*

Nur Najihah Nor Hisham, Nurul Arfah Che Mustapha and Azhar Mohd Ibrahim (International Islamic University Malaysia, Malaysia)

#### 4:30 *Machine Learning (ML) Assisted Edge Security Framework on FPGAs*

Abdul Manan Sheikh (International Islamic University Malaysia, India); Md Rafiqul Islam (International Islamic University Malaysia, Malaysia); Mohamed Hadi Habaebi (International Islamic University Malaysia (IIUM), Malaysia); Suriza Ahmad Zabidi (International Islamic University Malaysia, Malaysia); Athaur Rahman Najeib (International Islamic University of Malaysia, Malaysia); Ahmed Basahel (International Islamic University Malaysia, Malaysia)

#### 4:45 *IoT Based Indoor Air and Water Quality Monitoring System Using Node-RED*

Zharfan Hasbullah (Universiti Sains Islam Malaysia, Malaysia); Hafizal Bin Mohamad (USIM, Malaysia)

#### 5:00 *Portable Real Time Microwave Milk Quality Monitoring Sensor (On-site)*

Lubina Iram (Sukkur-IBA University, Pakistan); Muhammad Y Sandhu (Gdansk University of Technology, Pakistan & Sukkur IBA University, Pakistan); Akm Zakir Hossain and Sana Ullah Khan (Universiti Teknikal Malaysia Melaka, Malaysia)

#### 5:15 *Biocompatibility Assessment of Wearable C/TPU/Tegaderm Strain Sensors (On-site)*

Nur Nazihah Abu Hassan Zahri, Anis Nurashikin Nordin, Ahmad Fairuzabadi Mohd Mansor, Rosminazuin Ab Rahim and Aliza Aini Md Ralib (International Islamic University Malaysia, Malaysia); Muhammad Irsyad Suhaimi (Jabil Circuit Inc, USA); Lai Ming Lim (Jabil Circuit Inc, Malaysia)

**Tuesday, August 15 4:00 - 5:15 (Asia/Kuala\_Lumpur)**

**2C: Software Engineering**

**Room:: E2 -1 -4, Block E2 Kulliyah of Engineering & Zoom Breakout room name: 2C**

**Chair:** Assoc. Prof. Dr. Suriza Ahmad Zabidi (International Islamic University Malaysia (IIUM), Malaysia)

**4:00 *Design and Development of an Intuitive Desktop Application for Rapid SARS-CoV-2 Diagnosis Using Electrochemical Potentiostat (On-site)***

Faisal Ahmed Assaig, Teddy Surya Gunawan, Anis Nurashikin Nordin and Rosminazuin Ab Rahim (International Islamic University Malaysia, Malaysia); Zainiharyati Mohd Zain (Universiti Teknologi MARA, Malaysia)

**4:15 *Software for the Electronic Measurement of Work Stress in the Microenterprise Sector***

Gustavo E Fernandez (Instituto Superior Tecnológico España & CYSSA, Ecuador); Gissela A Arcos (Instituto Superior Tecnológico España, Ecuador); María A Barba and Lucila J De la Calle (Universidad Nacional de Chimborazo, Ecuador); José L Vásquez (Universidad Estatal de Bolívar, Ecuador)

**4:30 *Development of Monitoring System for Mentor-Mentee Programme (On-site)***

Noralia Hazira Norhamidi, Mohd Shahrin Abu Hanifah, Nurul Fariza Zulkurnain and Rosminazuin Ab Rahim (International Islamic University Malaysia, Malaysia)

**4:45 *Development of Energy Management Information System (EMIS) for Energy-Saving Awareness (On-site)***

Dayana Khadijah Enche Shaari (International Islamic University of Malaysia, Malaysia); Mohd Shahrin Abu Hanifah (International Islamic University Malaysia, Malaysia)

**5:00 *Enhanced Operations and Maintenance Solution for IMS System (On-site)***

Tien Xuan Nguyen, Phuong Thi Hoai Nguyen, Nam Huu Tien Chu, Lam The Nguyen and Vuong Ngo (Viettel High-Technologies Industries Corporation, Vietnam) [↑ To Top](#)

## WEDNESDAY, 16 AUGUST 2023

Wednesday, August 16 9:00 - 10:00 (Asia/Kuala\_Lumpur)

### Keynote 2: The Trend and Impact of Computer Technologies to Telecommunication

Room:: E2 –1 -2, Block E2 Kulliyah of Engineering & Zoom

Mr. Tan Cheng Peng, Maxis

Chair: Prof. Dr. Muhammad Ibn Ibrahimy (International Islamic University Malaysia (IIUM), Malaysia)

Wednesday, August 16 10:00 - 11:00 (Asia/Kuala\_Lumpur)

### Keynote 3: Malaysia Renewable Energy Roadmap

Room:: E2 –1 -2, Block E2 Kulliyah of Engineering & Zoom

Mr. Saiful Hakim Abdul Rahman, Sustainable Energy Development Authority (SEDA)

Chair: Assoc. Prof. Dr. Khairayu Badron (International Islamic University Malaysia (IIUM), Malaysia)

Wednesday, August 16 11:00 - 12:45 (Asia/Kuala\_Lumpur)

### 3A: AI & Machine Learning 1 / Green Technology & Smart Grid

Room:: E2 –1 -1, Block E2 Kulliyah of Engineering & Zoom Breakout room name: 3A

Chair: Ir. Dr. Yasser Asrul Ahmad (International Islamic University Malaysia (IIUM), Malaysia)

11:00 *Multi-CNN Voting Method for Improved Arabic Handwritten Digits Classification*

Areeg Fahad (Al-Nahrain University, Iraq); Muhammad Zarkoosh (Freelancer, Iraq); Sana Sabah Sabary (Luleå University of Technology, Sweden)

11:15 *The Impact of Feature Selection on Malware Classification Using Chi-Square and Machine Learning*

Areeg Fahad (Al-Nahrain University, Iraq); Muhammad Zarkoosh (Freelancer, Iraq); Sana Sabah Sabary (Luleå University of Technology, Sweden)

11:30 *The Color-Texture Features and Machine Learning Approach for Quality Detection of Coffee Beans*

Anindita Septiarini and Hamdani Hamdani (Universitas Mulawarman, Indonesia); Aji Ery Burhandenny and Subhan Nur (Mulawarman University, Indonesia); Edy Winarno (Universitas Stikubank Semarang, Indonesia)

11:45 *Analysis of EfficientNet Architecture Performance for Classifying the Tea Leaves Diseases*

Ummul Hairah, Anindita Septiarini and Novianti Puspitasari (Universitas Mulawarman, Indonesia); Efraim Romiyanto (Mulawarman University, Indonesia); Noor Alam Hadiwijaya and Damar Nurcahyono (Politeknik Negeri Samarinda, Indonesia)

12:00 *Comparison of Bayes Theorem and Dempster Shafer Methods for Detection Pests of Mayas Rice Plants*

Novianti Puspitasari, Havaluddin Havaluddin, Ummul Hairah and Anindita Septiarini (Universitas Mulawarman, Indonesia)

12:15 *Optimizing Optical Efficiency of Solar Power Tower Using a Novel Equation for Varying Heliostat Elevation in Biomimetic Layout*

Md. Imran Shahriar (Shahjalal University of Science and Technology, Bangladesh)

12:30 *A Hemisphere-Based Approach for the Design and Optimization of Nonequal Heliostat Fields for Solar Power Towers*

Md. Imran Shahriar (Shahjalal University of Science and Technology, Bangladesh)

### 3B: AI & Machine Learning 2 / RF & Microwave Circuits and Devices

Room:: E2 –1 -2, Block E2 Kulliyah of Engineering & Zoom Breakout room name: 3B

Chair: Assoc. Prof. Dr. Khairul Azami Sidek (International Islamic University Malaysia (IIUM), Malaysia)

11:00 *Detection of Leukemia Using Inception-V3 and GoogLeNet*

- Yessi Jusman (Universitas Muhammadiyah Yogyakarta, Indonesia)
- 11:15 *Wet and Dry Cough Classification System Using Support Vector Machine and Logistic Regression*  
Sean Andrei Co, Claudine Anne Madamba, Maria Leonora Guico and Jan Kevin Albior Galicia (Ateneo de Manila University, Philippines)
- 11:30 *Measurement and Forecasting of Fluctuating Cryptocurrency Prices Using Deep Learning*  
Fozia Zeeshan (Lincoln University Christchurch, New Zealand); Narayan Nepal Nepal (University of Canterbury, New Zealand); Mohammad Norouzifard (University of Auckland, New Zealand & Yoobee College of Creative Innovation, New Zealand)
- 11:45 *A Robust and Accurate Potato Leaf Disease Detection System Using Modified AlexNet Model*  
Abhishek Bajpai (Rajkiya Engineering College, Kannauj, Uttar Pradesh, India); Mohini Tyagi (Rajkiya Engineering College Kannauj, India); Manish Khare (Dhirubhai Ambani Institute of Information and Communication Technology, India); Abhinav Singh (REC Kannauj, India)
- 12:00 *Utilizing Deep Learning for the Real-Time Detection of Breast Cancer Through Thermography*  
Mohammed Abdullah Salim Al Husaini (Sultan Qaboos University, Oman & International Islamic University Malaysia, Oman); Mohamed Hadi Habaebi (International Islamic University Malaysia (IIUM), Malaysia); Md Rafiqul Islam (International Islamic University Malaysia, Malaysia)
- 12:15 *Performance Evaluation of Coherent MIMO Radar Assisted With Space-Time Coding*  
Othman Omran Khalifa (International Islamic University Malaysia (IIUM), Malaysia); Mohamed E Barakat (Sudan University of Science and Technology, Sudan); Rashid A. Saeed (Taif University, Saudi Arabia & Sudan University of Science and Technology SUST, Sudan); Salaheldin Edam (Beijing University of Post and Telecommunications, Sudan); Mohammed Barakat (Sudan University of Science and Technology, Sudan)
- 12:30 *Investigation on the Planar Resonator for Fabric Based Chipless RFID (On-site)*  
Akm Zakir Hossain and Sana Ullah Khan (Universiti Teknikal Malaysia Melaka, Malaysia); S. M. Kayser Azam and Muhammad Ibn Ibrahimy (International Islamic University Malaysia, Malaysia)

### **3C: AI & Machine Learning 3 / Cyber Security & Network Reliability/ Emerging Technologies**

**Room:: E2 –1 -4, Block E2 Kulliyah of Engineering & Zoom Breakout room name: 3C**

**Chair:** Assoc. Prof. Dr. Nurul Fariza Zulkurnain (International Islamic University Malaysia (IIUM), Malaysia)

- 11:00 *MFCCs and TEO-MFCCs for Stress Detection on Female Gender Through Deep Learning (On-site)*  
Nur Aishah Zainal, Ani Liza Asnawi, Ahmad Zamani Jusoh, Siti Noorjannah Ibrahim, Huda Adibah Mohd Ramli and Nor Fadhillah Mohamed Azmin (International Islamic University Malaysia, Malaysia)
- 11:15 *Web-Based Safety Eyewear Detection System in Workplace Using Machine Learning (On-site)*  
Nurul Fariza Zulkurnain (International Islamic University Malaysia, Malaysia); Yasser Asrul Ahmad and Najla Athirah Mohd Nazri (IIUM, Malaysia)
- 11:30 *Photovoltaic Module Defects Classification Analysis Using ShuffleNet Architecture in Electroluminescence Images*  
Shahrani Shahbudin and Muhammad Waliuddin Faiz Mohamad Rozi (Universiti Teknologi MARA, Malaysia)
- 11:45 *Intelligent Analysis of Students' Performance in Nigerian Schools: A Multi-Layer Perceptron Based Prediction*  
Rashidah Funke Olanrewaju (International Islamic University Malaysia, Malaysia); Esther Samuel Alu (Nasarawa State University, Nigeria); Afolayan A. Obinyi (Obinyi, Nigeria); Muhammad Dahiru Liman (Federal University of Lafia, Nigeria)
- 12:00 *Harnessing the Power of a Bidirectional Long Short-Term Memory-Based Prediction Model: A Case of Student Academic Performance*  
Fatima AbdulSalam Yunus (Nasarawa State University Keffi, Nasarawa State, Nigeria); Rashidah Funke Olanrewaju (International Islamic University Malaysia, Malaysia); Binyamin Adeniyi Ajayi (Nasarawa State University Keffi, Nasarawa State, Nigeria); Abdullahi Audu (Nasarawa State University, Keffi, Nigeria)
- 12:15 *Unmasking log4j's Vulnerability: Protecting Systems Against Exploitation Through Ethical Hacking and Cyberlaw Perspectives*  
Muhammad Fakhru Safitra (Telkom University, Indonesia); Furqan Maulana (University of Telkom & XYZ Company, Indonesia); Hanif Fajri and Muharman Lubis (Telkom University, Indonesia)
- 12:30 *A Survey on Blockchain Security and Its Impact Analysis*  
Md Rafiqul Islam (International Islamic University Malaysia, Malaysia); Muhammad Mahbubur Rashid (IIUM Gombak Malaysia, Malaysia)

## Wednesday, August 16 2:00 - 3:45 (Asia/Kuala\_Lumpur)

### 4A: AI and Machine Learning 4 / Electronic Communication / Advanced Computing Architectures

**Room:: E2 –1 -1, Block E2 Kulliyah of Engineering & Zoom Breakout room name: 4A**

**Chair:** Assoc. Prof. Dr. Siti Noorjannah Ibrahim (IIUM, Malaysia)

#### 2:00 *Task Reverse Offloading With Deep Reinforcement Learning in Multi-Access Edge Computing*

Mamoon Saeed (University of Modern Sciences (UMS), Saudi Arabia); Rashid A. Saeed (Taif University, Saudi Arabia & Sudan University of Science and Technology SUST, Sudan); Rania A Mokhtar (Taif University, Saudi Arabia); Othman Omran Khalifa (International Islamic University Malaysia (IIUM), Malaysia); Zeinab Ahmed (International Islamic University Malaysia, Malaysia); Mohammed Barakat (Sudan University of Science and Technology, Sudan); Areeg Ali Elnaim (Alneelain University Khartoum, Sudan)

#### 2:15 *Pest Detection in Plants Using Google Inception V3 Architecture as Image Embedding (On-site)*

Intan Nurma Yulita (Universitas Padjadjaran, Indonesia); Firman Ardiansyah (Institut Teknologi Dan Bisnis Ahmad Dahlan Lamongan, Indonesia)

#### 2:30 *Study on Artificial Neural Network Optimization for Electric Vehicle Battery State of Charge Estimation*

Aaruththiran Manoharan ( & University of Nottingham Malaysia Campus, Malaysia); Mumtaj Begam Kasim Rawthar (University of Nottingham Malaysia Campus, Malaysia); Denesh Sooriamoorthy (Taylor's University, Malaysia); Vimal Rau Aparow (University of Nottingham Malaysia & Faculty of Science and Engineering, Malaysia)

#### 2:45 *Convolution Neural Networks Based Feature Fusion for Automatic Modulation Classification*

Mohamed S Elshebani (College of Electronic Technology Bani Walid, Libya); Yahya Ali (University of Tripoli Libya, Libya); Nser Azroug (Academy for Postgraduate Studies, Libya); Ramdan Kalifa (Higher Institute, Libya); Othman Omran Khalifa (International Islamic University Malaysia (IIUM), Malaysia); Rashid A. Saeed (Taif University, Saudi Arabia & Sudan University of Science and Technology SUST, Sudan)

#### 3:00 *Forecasting Indonesian Crude Oil Price Using Autoregressive Integrated Moving Average (ARIMA) Method*

Haviluddin Haviluddin and Masna Wati (Universitas Mulawarman, Indonesia); Muh Jamil (Universitas Mulawarman & Departemen Of Information Technology And Computer Science, Indonesia); Akhmad Masyudi, Anindita Septiarini and Muhammad Bambang Firdaus (Universitas Mulawarman, Indonesia)

#### 3:15 *Lora Performance Evaluation in Coherent Rayleigh Fading Channel (On-site)*

Yasser Asrul Ahmad (IIUM, Malaysia); Muhammad Nasrin Aqil Abdul Hamid, Khaizuran Abdullah and Ahmad Fadzil Ismail (International Islamic University Malaysia, Malaysia)

#### 3:30 *Evaluating the Placement of Radio Hubs in Wireless NoC Architecture Through Distance Analysis*

Asrani Lit (Universiti Malaysia Sarawak (UNIMAS), Malaysia); Abadi Chanik Azhar and Yi Lung Then (Universiti Malaysia Sarawak, Malaysia); Abdul Rahman Kram (University Malaysia Sarawak, Malaysia); Nurul Izzati Hashim (Universiti Malaysia Sarawak, Malaysia & Universiti Pertahanan Nasional Malaysia, Malaysia); Fariza Mahyan (Politeknik Kuching Sarawak, Malaysia)

## Wednesday, August 16 2:00 - 3:30 (Asia/Kuala\_Lumpur)

### 4B: AI and Machine Learning 5 / Engineering Management

**Room:: E2 –1 -2, Block E2 Kulliyah of Engineering & Zoom Breakout room name: 4B**

**Chair:** Dr. Nadirah Abdul Rahim (International Islamic University Malaysia (IIUM), Malaysia)

#### 2:00 *Artificial Intelligence-Based Real-Time Facial Emotion Monitoring System*

Kishore T (NIT Warangal, India); Daya Sagar Tummala (National Institute of Technology Warangal, India)

#### 2:15 *A Homogeneous Meta-Learning LSTM-RNN Ensemble Method for Electric Vehicle Battery State of Charge Estimation*

Rae Hann Wong (Taylor's University, Malaysia); Aaruththiran Manoharan ( & University of Nottingham Malaysia Campus, Malaysia); Denesh Sooriamoorthy (Taylor's University, Malaysia); Nohaidda Sariff (Taylors University, Malaysia)

#### 2:30 *Lane Detection Using Deep Learning for All-Weather Conditions*

Hadhrami Ab Ghani (Universiti Malaysia Kelantan, Malaysia); Atiqullah Mohamed Daud (Multimedia University Melaka, Malaysia); Rosli Besar (Multimedia University, Malaysia); Zamani Md Sani

(Universiti Teknikal Malaysia Melaka, Malaysia); Mohd Nazeri Kamaruddin and Syabeela Syahali (Multimedia University, Malaysia)

2:45 *License Plate Detection Using Deep Learning Object Detection Models*

Kar Wan Leong (UTAR, Malaysia); Humaira Nisar (Universiti Tunku Abdul Rahman, Malaysia); Vooi Voon Yap (Aberystwyth University, United Kingdom (Great Britain)); Kim Ho Yeap (UTAR, Malaysia); Po Kim Lo (Universiti Tunku Abdul Rahman, Malaysia)

3:00 *Kalman Filter for Tracking a Noisy Cosinusoidal Signal With Constant Amplitude*

Prima Wijaya Kusuma (Universitas Mercu Buana, Indonesia); Mohamed Hadi Habaebi (International Islamic University Malaysia (IIUM), Malaysia); Galang P. N. Hakim (International Islamic University Malaysia, Malaysia & Universitas Mercu Buana, Indonesia); Rachmat Muwardi (Beijing Institute of Technology, Indonesia); Md Rafiqul Islam (International Islamic University Malaysia, Malaysia)

3:15 *Operational Cost Analysis of an Earth Station System Using Parallel Configuration*

Wan Muhamad Syaamil W. Aris and Nadirah Abdul Rahim (International Islamic University Malaysia, Malaysia)

**Wednesday, August 16 2:00 - 4:00 (Asia/Kuala\_Lumpur)**

**4C: Antennas and Propagation / Optical Communications and Photonics**

**Room:: E2 -1 -4, Block E2 Kulliyah of Engineering & Zoom Breakout room name: 4C**

**Chair:** Dr. Norazlina Saidin (International Islamic University Malaysia (IIUM), Malaysia)

2:00 *Design of a Flexible Textile Antenna for Early Breast Tumor Detections*

Maafuz Md Mahmudul Hasan and Md Rafiqul Islam (International Islamic University Malaysia, Malaysia); Mohamed Hadi Habaebi (International Islamic University Malaysia (IIUM), Malaysia); Norun Abdul Malek (International Islamic University Malaysia, Malaysia); Md Waliullah Sami (International Islamic University Chittagong, Bangladesh)

2:15 *Q & V Band Dual Offset Feed Parabolic Antenna for Satellite Communications in Equatorial Region (On-site)*

Yasser Asrul Ahmad (IIUM, Malaysia); Nur Hazirah Kamaruddin, Muhammad Nasrin Aqil Abdul Hamid and Khairayu Badron (International Islamic University Malaysia, Malaysia)

2:30 *Design of Quad Element MIMO Array With EBG Structure for Mutual Coupling Reduction (On-site)*

Md Abu Tayab Sakib, Md Rafiqul Islam, Md Shazzadul Islam, G. m. Asadullah and Mohd Saiful Riza Bashri (International Islamic University Malaysia, Malaysia)

2:45 *Multiwavelength Random Fiber Laser Based on Bidirectional SOA and Lyot Filter*

Allen Paul David (Universiti Teknologi Malaysia, Malaysia); Abdul Hadi Sulaiman (Universiti Tenaga Nasional, Malaysia); Hanun Enani Muhamad Aliza and Airull Azizi Awang Lah (Universiti Teknologi Malaysia, Malaysia); Siti Azlida Ibrahim (Multimedia University, Malaysia); Nelidya Md. Yusoff (Universiti Teknologi Malaysia, Malaysia)

3:00 *Multiwavelength Random Fiber Laser Using Dual Bidirectional Semiconductor Optical Amplifiers and PMF-Based Mach-Zehnder Interferometer*

Airull Azizi Awang Lah (Universiti Teknologi Malaysia, Malaysia); Abdul Hadi Sulaiman (Universiti Tenaga Nasional, Malaysia); Nelidya Md. Yusoff, Hanun Enani Muhamad Aliza and Allen Paul David (Universiti Teknologi Malaysia, Malaysia); Mohd Shahril Salleh (Telekom Malaysia R&D Sdn Bhd, Malaysia); Sumiaty Ambran (Universiti Teknologi Malaysia & Malaysia-Japan International Institute of Technology, Malaysia)

3:15 *Multiwavelength Random Fiber Laser Based on Dual-Bidirectional SOA at Different Comb Filters*

Airull Azizi Awang Lah (Universiti Teknologi Malaysia, Malaysia); Abdul Hadi Sulaiman (Universiti Tenaga Nasional, Malaysia); Hanun Enani Muhamad Aliza and Allen Paul David (Universiti Teknologi Malaysia, Malaysia); Sumiaty Ambran (Universiti Teknologi Malaysia & Malaysia-Japan International Institute of Technology, Malaysia); Mohd Shahril Salleh (Telekom Malaysia R&D Sdn Bhd, Malaysia); Nelidya Md. Yusoff (Universiti Teknologi Malaysia, Malaysia)

3:30 *Flatness Investigation of Multiwavelength SOA Random Fiber Laser Based on Sagnac Loop Mirror*

Hanun Enani Muhamad Aliza (Universiti Teknologi Malaysia, Malaysia); Abdul Hadi Sulaiman and Aiman Ismail (Universiti Tenaga Nasional, Malaysia); Allen Paul David (Universiti Teknologi Malaysia, Malaysia); Fairuz Abdullah (Universiti Tenaga Nasional & Institute of Power Engineering, Malaysia); Md Zaini Jamaludin (Universiti Tenaga Nasional, Malaysia); Airull Azizi Awang Lah and Nelidya Md. Yusoff (Universiti Teknologi Malaysia, Malaysia)

3:45 *Macro-Bending Effect of Single-Mode Fiber for Glucose Sensor*

Norazlina Saidin, Nur Farizah Harith, Huda Adibah Mohd Ramli, Aliza Aini Md Ralib and Norun Abdul Malek (International Islamic University Malaysia, Malaysia)





**International Conference on  
Chemical Engineering and  
Sustainability**

**ICCHES 2023**

## MESSAGE FROM THE CHAIRMAN OF ICCHES 2023



**Prof. Ir. Dr. Mohammed Saedi Jami**

**Chairman**

**International Conference on Chemical Engineering & Sustainability 2023  
(ICCHES 2023)**

*Assalamualaikum warahmatullahi wabarakatuh,*

The International Conference on Chemical Engineering & Sustainability 2023 (ICCHES 2023) (Previously known as ICBioE) is being organized by the Department of Chemical Engineering and Sustainability at the Faculty of Engineering, International Islamic University Malaysia. The conference will take place on August 15<sup>th</sup> – 16<sup>th</sup>, 2023, and its theme is "Nurturing Innovation for Sustainable and Green Future". The conference will serve as an international platform for researchers to share their ideas, experiences, and latest research findings and innovations in various fields of chemical engineering, including bioenergy, materials, bio-chemical engineering, environmental engineering, and bioprocess engineering. The submissions will undergo a rigorous review process by at least two experts, including members and non-members of the organizing committee. The organizer eagerly looks forward to see you there as the members of the organizing committee, participants, members of the advisory committee, keynote speakers, and sponsors and be a part of this impactful pool of ideas and knowledge sharing.

To summarize, we would like to extend a warm invitation to you to join us at our upcoming conference. We have an exciting line-up of speakers and topics that we believe will be of great interest to you and your colleagues. We hope you will take advantage of this opportunity to network, learn, and engage with other professionals in your specific field. We look forward to seeing you at the conference and hope that you will find it to be a valuable and enlightening experience. Thank you for the impactful work that you do and we hope to see you soon.

*Wassalam.*

**Prof. Ir. Dr. Mohammed Saedi Jami**  
**Chairman, ICCHES 2023**

# **ORGANIZING COMMITTEE OF ICCHES 2023**

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All Chairpersons of Sub-committees

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Dr. Mariatul Fazilah Mansor

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Assoc. Prof. Dr. Noor Illi Mohamad Puad

Dr. Yusilawati Ahmad Nor

Dr. Wan Mohd Fazli Wan Nawawi

## **ORGANIZING COMMITTEE OF ICCHES 2023**

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Br. Mohd Iznan Ab. Hamid  
Br. Mohd Hafizul Shaibon  
Br. Nasaruddin Mohd Sulaiman

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Prof. Dr. Ma'an Fahmi Al-Khatib  
Prof. Dr. Ts. Maizirwan Mel  
Assoc. Prof. Ir. Dr. Sarina Sulaiman  
Assoc. Prof. Dr. Dzun Noraini Jimat  
Assoc. Prof. Dr. Fathilah Ali  
Dr. Mohd Firdaus Abd Wahab  
Dr. Ricca Rahman Nasaruddin

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Prof. Dr. Md. Zahangir Alam  
Assoc. Prof. Dr. Dzun Noraini Jimat  
Dr. Ricca Rahman Nasaruddin

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Dr. Yusilawati Ahmad Nor  
Dr. Munira Shahbuddin  
Dr. Mariatul Fadzillah Mansor  
Dr. Nik Rashidah Nik Abdul Ghani  
Br. Aslan Sarif Asrimon  
Br. Anuar Ariffin  
Sr. Siti Noradila Md Misri  
Sr. Suharti Yahya

## TECHNICAL SESSION ICCHES 2023

Day 1: Tuesday 15 August 2023			
8.30 – 9.00	<b>Registration</b> <b>Venue – Lobby Audi A, Kulliyah of Engineering</b>		
<b>Opening</b> 9.00 – 10.00	<b>Opening Ceremony of the IIUM Engineering Congress 2023</b> <b>Welcoming Remarks</b> <b>by</b> <b>The Dean, The Rector and The President</b> <b>Venue - Audi A, Kulliyah of Engineering</b>		
10.00 – 10.15	<b>Break &amp; Networking</b>		
<b>Keynote 1</b> 10.15 – 11.15	<b>Title:</b> Engineering Education and Ethics Towards Sustainable Society <b>Presenter:</b> Honorable Rector YBhg. Prof. Emeritus Tan Sri Dato’ Dzulkipli Abdul Razak <b>Chairperson:</b> Assoc. Prof. Dr. Ali Sophian <b>Venue:</b> Audi A, Kulliyah of Engineering, Congress Zoom and YouTube.		
11.15 – 11.30	<b>Break &amp; Networking</b>		
<b>Keynote 2</b> 11.45 – 12.45	<b>Title:</b> Decolonization technologies for the natural gas processes as the transition energy source <b>Presenter:</b> Prof. Nimir Elbashir <b>Chairperson:</b> Prof. Ir. Dr. Mohammed Saedi Jami , IIUM, Malaysia <b>Venue:</b> E2-2-1 <b>Zoom Meeting:</b> <a href="https://iium.zoom.us/j/99213134246?pwd=OFIycS93bDBNTTY0SEsrNDcwdUZHQQT09">https://iium.zoom.us/j/99213134246?pwd=OFIycS93bDBNTTY0SEsrNDcwdUZHQQT09</a> <b>Meeting ID:</b> 992 1313 4246 <b>Passcode:</b> 857687		
12.45 – 14.00	<b>Lunch Break</b>		
14.00 – 15.15	<b>Parallel Session 1</b> <table border="0" style="width: 100%;"> <tr> <td style="width: 50%; vertical-align: top;"> <b>Venue – E2-2-2 (Room A)</b>  <b>Chairman –</b> Assoc. Prof. Dr. Nor Fadhillah  <b>Co- chair:</b> Dr. Mariatul Fadzillah Mansor               </td> <td style="width: 50%; vertical-align: top;"> <b>Venue – E2-2-1 (Room B)</b>  <b>Chairman –</b> Assoc. Prof. Ir. Dr. Sarina Sulaiman  <b>Co- chair:</b> Dr. Husna Ahmad Tajuddin               </td> </tr> </table>	<b>Venue – E2-2-2 (Room A)</b> <b>Chairman –</b> Assoc. Prof. Dr. Nor Fadhillah <b>Co- chair:</b> Dr. Mariatul Fadzillah Mansor	<b>Venue – E2-2-1 (Room B)</b> <b>Chairman –</b> Assoc. Prof. Ir. Dr. Sarina Sulaiman <b>Co- chair:</b> Dr. Husna Ahmad Tajuddin
<b>Venue – E2-2-2 (Room A)</b> <b>Chairman –</b> Assoc. Prof. Dr. Nor Fadhillah <b>Co- chair:</b> Dr. Mariatul Fadzillah Mansor	<b>Venue – E2-2-1 (Room B)</b> <b>Chairman –</b> Assoc. Prof. Ir. Dr. Sarina Sulaiman <b>Co- chair:</b> Dr. Husna Ahmad Tajuddin		

	1A: Advanced Materials, Composites & Nanotechnology <b>Paper ID: 32, 34, 38, 15 (OL), 27 (OL)</b>	1B: Water and Environmental Engineering <b>Paper ID: 22, 37, 25, 24, 49</b>
15.15 – 15.45	<b>Break &amp; Networking</b>	
	<b>Parallel Session 2</b>	
15.45 – 17.00	<b>Venue - E2-2-2 (Room A)</b> <b>Chairman</b> – Prof. Dr. Ma'an Fahmi Al-Khatib <b>Co- chair:</b> Dr. Nik Rashida 2A: Biotechnological, Bioprocess & Biochemical Engineering <b>Paper ID: 6, 9, 19, 42, 35</b>	<b>Venue - E2-2-1 (Room B)</b> <b>Chairman</b> – Prof. Dr. Faridah Yusof <b>Co- chair:</b> Dr. Farah Ahmad 2B: Net zero carbon emission/ Natural Products, Commodity Crops & Biomass/ Related Chemical and Biochemical Engineering <b>Paper ID: 8, 7, 47, 26 (OL), 16 (OL)</b>
<b>END OF DAY 1</b>		

## TECHNICAL SESSION ICCHES 2023

Note: OL is for online

Day 2: Wednesday 16 August 2023		
9.00 – 10.30	<b>Parallel Session 3</b>	
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <b>Venue - E2-2-2 (Room A)</b>  <b>Chairman</b> – Prof. Dr. Ts. Maizirwan Mel  <b>Co- chair:</b> Dr. Nurul Sakinah                      3A: Bioenergy, Green Technology and Renewable Energy/ Water and Environmental Engineering  <b>Paper ID: 40, 21, 14 (OL), 4(OL)</b> </td> <td style="width: 50%; padding: 5px;"> <b>Venue - E2-2-1 (Room B)</b>  <b>Chairman</b> – Assoc. Prof. Dr. Fazia Adyani  <b>Co- chair:</b> Dr. Yusilawati                      3B: Biosensor, Biomedical Technology/ Food, Pharmaceutical Engineering and Manufacturing/ Separation and Purification  <b>Paper ID: 33, 48, 39(OL),20 (OL)</b> </td> </tr> </table>	<b>Venue - E2-2-2 (Room A)</b> <b>Chairman</b> – Prof. Dr. Ts. Maizirwan Mel <b>Co- chair:</b> Dr. Nurul Sakinah 3A: Bioenergy, Green Technology and Renewable Energy/ Water and Environmental Engineering <b>Paper ID: 40, 21, 14 (OL), 4(OL)</b>
<b>Venue - E2-2-2 (Room A)</b> <b>Chairman</b> – Prof. Dr. Ts. Maizirwan Mel <b>Co- chair:</b> Dr. Nurul Sakinah 3A: Bioenergy, Green Technology and Renewable Energy/ Water and Environmental Engineering <b>Paper ID: 40, 21, 14 (OL), 4(OL)</b>	<b>Venue - E2-2-1 (Room B)</b> <b>Chairman</b> – Assoc. Prof. Dr. Fazia Adyani <b>Co- chair:</b> Dr. Yusilawati 3B: Biosensor, Biomedical Technology/ Food, Pharmaceutical Engineering and Manufacturing/ Separation and Purification <b>Paper ID: 33, 48, 39(OL),20 (OL)</b>	
10.30 – 11.00	<b>Break &amp; Networking</b>	
11.10 – 12.30	<b>Parallel Session 4</b>	
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; padding: 5px;"> <b>Venue - E2-2-2 (Room A)</b>  <b>Chairman</b> – Assoc. Prof. Dr. Fathilah Ali  <b>Co- chair:</b> Dr. Ricca Rahman                      4A: Biotechnological, Bioprocess, Biochemical Engineering/ Advanced Materials, Composites, Nanotechnology  <b>Paper ID: 31, 23, 29, 43, 44 (all OL)</b> </td> <td style="width: 50%;"></td> </tr> </table>	<b>Venue - E2-2-2 (Room A)</b> <b>Chairman</b> – Assoc. Prof. Dr. Fathilah Ali <b>Co- chair:</b> Dr. Ricca Rahman 4A: Biotechnological, Bioprocess, Biochemical Engineering/ Advanced Materials, Composites, Nanotechnology <b>Paper ID: 31, 23, 29, 43, 44 (all OL)</b>
<b>Venue - E2-2-2 (Room A)</b> <b>Chairman</b> – Assoc. Prof. Dr. Fathilah Ali <b>Co- chair:</b> Dr. Ricca Rahman 4A: Biotechnological, Bioprocess, Biochemical Engineering/ Advanced Materials, Composites, Nanotechnology <b>Paper ID: 31, 23, 29, 43, 44 (all OL)</b>		
12.30 – 14.00	<b>Lunch Break</b>	
14.00 – 15.00	<b>Closing Session &amp; Best Presentation Award</b>	
<b>END OF DAY 2</b>		



**6<sup>th</sup> International Conference on  
Mechanical, Automotive and Aerospace  
Engineering 2023**

**ICMAAE 2023**



## MESSAGE FROM THE CHAIRMAN OF ICMAAE '23



### **Fadly Jashi Darsivan**

**Chairman**

**6th International Conference on Mechanical, Automotive and Aerospace Engineering 2023  
(ICMAAE '23)**

*Assalamualaikum warahmatullahi wabarakatuh,*

Welcome to the International Conference on Mechanical, Automotive, and Aerospace 2023, ICMAAE '23. We gather here to celebrate the brilliance of engineering and technology, uniting researchers, professionals, and experts from across the globe.

Within these pages of the program book, a realm of knowledge awaits you—a testament to human ingenuity, innovation, and collaboration. From mechanics to automotive engineering, and aerospace exploration, we showcase the incredible achievements that have shaped our world.

As we delve into plenary sessions and technical presentations let us remember the power of collective wisdom. Together, we can overcome challenges and unlock opportunities that lie ahead. This conference not only heralds progress but also reminds us of our responsibility. Sustainable development and ethical practices must underpin every advancement we make. Let us steer our innovations toward a brighter and more inclusive future.

ICMAAE '23 is more than just an academic event; it embodies the spirit of community. Let us cherish the bonds formed here and leverage mentorship to nurture the next generation of visionaries. In conclusion, my gratitude goes to all whose dedication made ICMAAE '23 a reality. This program book serves as a beacon, inspiring us to explore new frontiers, guided by the principles of responsible innovation.

Thank you and enjoy the enriching experience of ICMAAE '23. Together, we shape a world of endless possibilities.

*Wassalam.*

**Assoc. Prof. Dr. Fadly Jashi Darsivan**  
**Chairman of ICMAAE '23**

# **ORGANIZING COMMITTEE OF ICMAAE 2023**

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Fadly Jashi Darsivan

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Kassim Abdullah, UAE University, UAE  
Mohamed Okasha, UAE University, UAE  
Ari Legowo, HCT, UAE

## TECHNICAL SESSION ICMAAE 2023

<b>Day 1: Tuesday 15 August 2023</b>	
8.30 – 9.00	<b>Registration</b> <b>Venue – Lobby - Audi A, Kulliyah of Engineering</b>
<b>Opening</b> 9.00 – 10.00	<b>Opening Ceremony of the IIUM Engineering Congress 2023</b> <b>Welcoming Remarks</b> <b>by</b> <b>The Dean, The Rector and The President</b> <b>Venue - Audi A, Kulliyah of Engineering</b>
10.00 – 10.15	<b>Break &amp; Networking</b>
<b>Keynote 1</b> 10.15 – 11.15	<b>Title:</b> Engineering Education and Ethics Towards Sustainable Society <b>Presenter:</b> Prof. Emeritus Tan Sri Dato’ Dzulkifli Abdul Razak <b>Venue:</b> <b>Audi A, Kulliyah of Engineering</b>
11.15 – 11.30	<b>Break &amp; Networking</b>
<b>Keynote 2</b> 11.30 – 12.30	<b>Title:</b> Innovating in Malaysian Industrial Ecosystems <b>Presenter:</b> Mr. Naguib Mohd Nor <b>Chairperson:</b> Prof. Dr. Meftah Hrairi, IIUM, Malaysia <b>Venue:</b> <b>Main Conference Room</b>
12.30 – 14.00	<b>Lunch Break</b>
<b>Keynote 3</b> 14.00 – 15.00	<b>Title:</b> Research Trends in Sustainable Mobilities <b>Presenter:</b> Dr. Raja Mazuir Shah <b>Chairperson:</b> Prof. Dr. Waqar Asrar, IIUM, Malaysia <b>Venue:</b> <b>ICMAAE Room A</b>
15.00 – 15.15	<b>Break &amp; Networking</b>

## TECHNICAL SESSION ICMAAE 2023

Day 1: Tuesday 15 August 2023		
15.15 – 16.40	<b>Parallel Session 1</b>	
	<b>Venue - ICMAAE Room A</b> <b>Chairman - Dr. Nabilah Ramli</b> Aerospace Propulsion <b>Paper ID: 23, 29, 34, 43</b>	<b>Venue - ICMAAE Room B</b> <b>Chairman - Dr. Dwi Pebrianti</b> Structures & Materials I <b>Paper ID: 17, 18, 19, 26</b>
<b>END OF DAY 1</b>		

## TECHNICAL SESSION ICMAAE 2023

Day 2: Wednesday 16 August 2023		
9.00 – 11.00	<b>Parallel Session 2</b>	
	<b>Venue - ICMAAE Room A</b> <b>Chairman - Dr. Muhammad Hanafi</b> Aerodynamics & Aeroelasticity I <b>Paper ID: 7, 8, 36, 44</b>	<b>Venue - ICMAAE Room B</b> <b>Chairman - Dr. Sanisah Saharin</b> Aerospace & Structures <b>Paper ID: 9, 11, 21, 22, 24</b>
11.00 – 11.15	<b>Break &amp; Networking</b>	
11.15 – 13.00	<b>Parallel Session 3</b>	
	<b>Venue - ICMAAE Room A</b> <b>Chairman - Dr. Adib Hamdani</b> Structures & Materials II <b>Paper ID: 12, 13, 14, 15, 35</b>	<b>Venue - ICMAAE Room B</b> <b>Chairman - Dr. Norfazrina</b> Structures & Materials III <b>Paper ID: 4, 6, 20, 27, 40</b>
13.00 – 14.00	<b>Lunch Break</b>	
14.00 – 15.40	<b>Parallel Session 4</b>	
	<b>Venue - ICMAAE Room A</b> <b>Chairman - Dr. Muhammad Abdullah</b> Structural Dynamics & Controls <b>Paper ID: 25, 28, 33</b>	<b>Venue - ICMAAE Room B</b> <b>Chairman - Dr. Hanan Mokhtar</b> Structures & Materials IV <b>Paper ID: 37, 38, 39, 41, 42</b>
<b>END OF DAY 2</b>		



**6<sup>th</sup> International Conference on  
Engineering Professional Ethics  
and Education**

**ICEPEE 2023**

## MESSAGE FROM THE CHAIRMAN OF ICEPPE 2023



**Assoc Prof. Dr. Ani Liza Asnawi**

**Chairman of 6<sup>th</sup> International Conference on Engineering Professional Ethics and Education 2023 (ICEPEE' 23)**

Assalamualaikum waramatullahi wabarakuh

A warm welcome to the 6<sup>th</sup> International Conference on Engineering Professional Ethics and Education (ICEPEE'23), organized by the INTEGRATES (Integrative Engineering Education and Ethics for Sustainability) research group, Kulliyyah of Engineering, International Islamic University Malaysia (IIUM). We proudly present our conference theme this year, which focus on the “*Engineering Education and Ethics towards Sustainable Society*”.

Globalization has led the whole world to be closely connected and interdependent economically, socially, and politically. This has led to increasing apprehension globally that many engineering advancements and scientific research lead to contentious breakthroughs and outcomes that are ethically unacceptable. In the era marked by rapid technological advancements and global challenges, the intersections of sustainability, ethics and engineering education have never been significant. Today, as engineers and educators, we carry profound responsibility not only to develop innovative solutions but also to perform it with a conscious understanding of their impact on our society, generations, and our ecosystem as well.

The ICEPEE'23 with its significant theme serves as a platform to bring the gaps between theory and practice, to share insights that inspired ethical considerations in engineering, and to foster a commitment to sustainability that echoes through our institutions, curriculum, and research. As we embark on this transformative journey over the coming days, it is important for us to take every opportunity to engage, learn and collaborate. The objective of this conference is to gather all related parties to exchange relevant ideas and findings to enrich their knowledge and views on the significance of the engineering education, and ethics in shaping our future generation.

I would like to take this opportunity to extend my heartfelt gratitude to our keynote speakers, authors, and presenters, who have dedicated their commitment to the accomplishment of this conference. Surely the insights and all the sharing will undoubtedly serve as beacons of inspiration for us to continue the journey in shaping our engineers and society. This conference also will not be possible without the tireless effort of our organizing committee particularly. For the organizing committee, thank you for your hard work and support that have turned this conference into a reality and success. May Allah grant the efforts tremendously.



Finally, on behalf of the organizing committee, I welcome all participants to the ICEPEE'23, may this platform bring a meaningful change and inspire us for shaping our engineering education and ethics towards a sustainable society. Thank you and let us embrace the challenges and opportunities that lie ahead.

Best Regard,

Assoc Prof. Dr. Ani Liza Asnawi  
Chairman, ICEPEE'23

## ORGANIZING COMMITTEE OF ICEPEE 2023

Chairman:	Assoc Prof Dr. Ani Liza Bt. Asnawi
Co-chairman:	Assoc. Prof. Dr. Siti Noorjannah Bt. Ibrahim Prof. Dr. Aisha Hassan Abdalla Hashim
Secretary:	Dr. Nurul Arfah Binti Che Mustapha Dr. Norazlina Saidin
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## ICEPEE '23 PROGRAM SCHEDULE

<b>DAY 1: 15 AUGUST 2023, TUESDAY</b>	
8:00am - 9:00am	Online attendance to the Congress IEC 2023
9:00am - 10:00am	Opening Ceremony
10:00am - 10:15am	Online attendance to ICEPEE 2023
10:15am - 11:30am	<b>KEYNOTE SPEECH 1: TAN SRI DATO' DZULKIFLI ABDUL RAZAK</b> TOPIC: ENGINEERING EDUCATION AND ETHICS TOWARDS SUSTAINABLE SOCIETY <b>CHAIR: Assoc. Prof. Dr. Ali Sophian</b>
11:30am-11:45am	Break & Networking
11:45am - 12:45pm	<b>KEYNOTE SPEECH 2: PROF. DR. ABDEL MAGID HAMOUDA</b> TOPIC: PREPARING STUDENTS FOR INDUSTRY: BRIDGING THE GAP BETWEEN ACADEMIA AND THE REAL WORLD <b>CHAIR: Prof. Dr. Zuraida Ahmad</b>
12:45pm-2:00pm	Lunch Break
<b>Session 1 (THEME: Enhancing Innovation in Research and Innovation)</b> <b>CHAIR: Assoc. Prof. Dr. Siti Noorjannah Bt. Ibrahim</b> <b>Co-Chair: Dr. Hasmawati Bt. Antong</b>	
2:00pm-2:20pm	ID2
2:20pm-2:40pm	ID5
2:40pm-3:00pm	ID9
3:00pm-3:20pm	ID10
3:20pm - 3:35pm	Break & Networking
<b>Session 2 (THEME: Enhancing Innovation in Research and Innovation)</b> <b>CHAIR: Dr. Hazlina Md Yusuf</b> <b>Co-Chair: Dr. Ahmad Zamani Bin Jusoh</b>	
3:35pm-3:55pm	ID14
3:55pm-4:15pm	ID16
4:15pm-4:35pm	ID17
4:35pm-4:55pm	ID18
<b>END OF DAY 1</b>	

## **DAY 2: 16 AUGUST 2023, WEDNESDAY**

<b>Session 3 (THEME: Professionalism and Ethics in Engineering &amp; Engineering Education)</b> <b>CHAIR: Assoc. Prof. Dr. Nor Fadhillah Bt. Mohamed Azmin</b> <b>Co-Chair: Dr. Nurul Arfah Binti Che Mustapha</b>	
9:10am-9:30am	ID6
9:30am-9:50am	ID8
9:50am-10:10am	ID19
10:10am-10:30am	ID15
10:30am-10:50am	ID4
10:50am - 11:05am	Break & Networking
<b>Session 4 (THEME: Sustainability in Engineering Education and Research)</b> <b>CHAIR: Assoc. Prof. Dr. Suriza Ahmad Zabidi</b> <b>Co-Chair: Dr. Nur Shahida Binti Midi</b>	
11:05am-11:25am	ID11
11:25am-11:45am	ID13
11:45am-12:05pm	ID20
12:05pm-12:25pm	ID21
12:25pm-2:00pm	Lunch Break
2:00pm - 3:00pm	<b>KEYNOTE SPEECH 3: PROF FATIN ALIA PHANG</b> <b>TOPIC: RESEARCH IN ENGINEERING EDUCATION FOR TEACHING EXCELLENCE CAREER PATHWAY</b> <b>CHAIR: Prof. Aisha Abdalla Hassan</b>
3:00pm - 3:15pm	Break & Networking
<b>Session 5 (THEME: Sustainability in Engineering Education and Research)</b> <b>CHAIR: Assoc. Prof. Dr. Ani Liza</b> <b>Co-Chair: Dr. Siti Noratikah binti Che Deraman</b>	
3:15pm-3:35pm	ID3
3:35pm-3:55pm	ID7
3:55pm-4:15pm	ID12
4:15pm - 4:45pm	Break & Networking
4:45pm	ICEPEE Closing & Award Ceremony

## 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 24,000 students (18,000 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.

## 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, Chemical Engineering, Civil Engineering, Electrical and Electronics Engineering, Manufacturing Engineering, Materials Engineering, Mechanical 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 around 2200 and more than 200 at the postgraduate level.

Research and development are one of the primary activities in the Kulliyah of Engineering which is harnessed by excellent facilities, qualified and competent academic staff, and holistic 'Garden of Knowledge and Virtue' ecosystem that elevate active participations in research activities in multi-disciplinary engineering areas. To foster research collaboration amongst faculty members, research units and research groups have been established towards broader Quintuple-Helix interactions for problem solving and solutions. Presently, there are three research units and fifteen research groups spanning over 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 a wide range opportunity of postgraduate studies with Ph.D. and Masters degree programmes. With the Kulliyah's philosophy that is based on systems approach, the engineering programmes offer an integrated and comprehensive education that transcends the boundaries of various disciplines. The Ph.D. programme is by research whereas the Master degree

## **KULLIYAH OF ENGINEERING, IIUM**

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program is conducted in three different modes, namely, research only, mixed mode (equal number of credits for both taught courses and research element), and coursework mode.

The Mixed-mode and Coursework mode programmes are offered in the following nine (9) programmes respectively: Automotive Engineering, Biotechnology Engineering, Communication Engineering, Computer and Information Engineering, Electronic Engineering, Manufacturing Engineering, Material Engineering, Mechanical Engineering and Mechatronics Engineering.

In addition to its teaching role, the Kulliyyah has the responsibility to conduct strong research programmes that contribute to the advancement of knowledge. Fourteen (14) cutting edge specialisations are offered under the MSc in Engineering (Full Research) programme, that are Automotive Engineering, Biochemical Engineering, Biotechnology Engineering, Communication Engineering, Computer and Information Engineering, Chemical Engineering, Civil Engineering, Electronics Engineering, Engineering Mathematics, Engineering Science, Manufacturing Engineering, Material Engineering, Mechanical Engineering and Mechatronics Engineering.

## ACKNOWLEDGEMENT

The organizing committee acknowledges the efforts of all those who have contributed their valuable time and efforts as reviewers in ensuring high-quality technical papers for the IIUM Engineering Congress 2023.

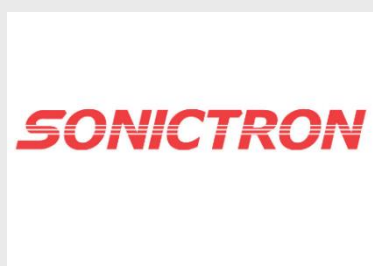
Deepest appreciation to all faculty members of the Kulliyah of Engineering, International Islamic University Malaysia (IIUM) for their sincere cooperation in making the conference successful. Appreciation also goes to all parties who have contributed to the success of the IIUM Engineering Congress 2023.

Finally, the organizing committee would like to express their thanks to the following companies for sponsoring this congress:



ICESCO Chair in Sustainable Engineering (ICESCO CiSE) is a programme initiated by the Islamic World Educational, Scientific and Cultural Organization (ICESCO), for promoting capacities of the institutions of higher education by facilitating access to knowledge and taking parts in its activities e.g., motivation, training and research activities, academic exchange etc.

ICESCO CiSE is based at the Kulliyah of Engineering, and focuses on youth training and capacity building and its sustainability. Our vision and action strategy dwell on three main domains : 1) Capacity building project for youth in national STEM Education at the primary and secondary level of schooling, 2) Project on the new outlook of the engineering programmes and 3) Contribution of engineering on sustainability of the society through capacity building.



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