

# IMESS 2019

## AI, 5G, and IoT: Technology Convergence for Betterment of Humanity

The IEEE Malaysia Electron Devices Society (EDS), IEEE Microwave Theory and Techniques Society (MTT-S), and IEEE Solid-State Circuits Society (SSCS) Penang Joint Chapter organized the fourth IEEE International Microwave, Electron Devices, and Solid-State Circuits Symposium (IMESS) on 8–9 October 2019, at the Penang Skills Development Center (PSDC). Since the inaugural meeting in 2016, the IMESS has been recognized as a flagship IEEE event in northern peninsular Malaysia. The theme of IMESS 2019 was Artificial Intelligence (AI), 5G, and IoT: Technology Convergence for Betterment of Humanity. It was a successful event with approximately 200 participants from industry and academia exchanging ideas regarding topics related to microwaves, electron devices, and SSCs. IMESS 2019 featured keynote speeches, Distinguished Lecturers, and technical talks

by academia and industry experts; sponsor exhibitions; a design competition co-organized with FILPAL Pte. Ltd.; and a student technical visit to the Penang Design Center of the Plexus Islandview plant.

The IMESS has remained admission-free since 2016, owing to strong support from industry. IMESS 2019 received funding support from industry sponsors FILPAL, Motorola Solutions, MFS Technology, QDOS, QRF Solutions, Smartrac Technology, Synvue, Career Growth, Elliance, and Robert Bosch. IMESS 2019 was also supported by IEEE Region 10; the EDS, MTT-S, and SSCS; the Institution of Engineers, Malaysia; the Institution of Engineering and Technology; investPenang; the IEEE Nanotechnology Council; the Penang Convention and Exhibition Bureau; PSDC; and student volunteers from Universiti Sains Malaysia (USM).

The symposium kicked off with a keynote speech by Prof. Ewe Hong Tat, president of Universiti Tunku Abdul

Rahman. Tat shared his view on technology revolution, economic evolution, and moving forward to develop human capital to deal with new challenges in engineering and education. Penang's Deputy Chief Minister I of Penang, Datuk Ahmad Zakiyuddin Abdul Rahman, represented the chief minister and gracefully officiated at IMESS 2019 during the afternoon.

The opening ceremony started with a welcoming address by the IMESS 2019 chair, Ir. Dr. Lee Choo Yong. He noted that technology is a double-edged sword and that we must use technology wisely for the betterment of humanity in areas such as autonomous

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Digital Object Identifier 10.1109/MSSC.2019.2951654  
Date of current version: 23 January 2020



The IMESS 2019 opening ceremony.

driving, faster and easier communication, interactive learning, and seamless connectivity, all of which enable smart cities, smart agriculture, and more.

The ceremony continued with a speech by Muhamed Ali Hajah Mydin,

chief executive officer of PSDC. He emphasized that PSDC was established to develop talent in supporting industry. Since 2016, PSDC, as the Center of Excellence for Industry 4.0 in Penang, has initiated many programs to support companies moving toward

Industry 4.0. One of these programs is the Penang Manufacturing Excellence Conference and Exhibition.

This speech was followed by an opening address by Deputy Zakiyuddin, who noted that the IMESS 2019 theme was closely associated with

## THE SPEAKERS AND TOPICS AT IMESS 2019.

SPEAKER	AFFILIATION	TITLE
<b>Keynote Address</b>		
Prof. Ewe Hong Tat	Universiti Tunku Abdul Rahman, Malaysia	"AI, 5G, and IoT: Technology Convergence and Human Capital Development"
Dr. Pannirselvam Kanagaratnam (represented by Luke Jing Yuan)	MIMOS Berhad, Malaysia	"AI at the Edge"
Prof. Cor Claeys	KU Leuven, Belgium	"Material and Device Challenges for Future CMOS Technologies"
Dr. Khoh Soo Beng	PMO Innovations Sdn. Bhd., Malaysia	"Fuelling Innovation With Emerging Technology @4IR"
<b>SSC Track</b>		
Dr. Wong Yan Chew	Universiti Teknikal Malaysia Melaka	"-32dBm Sensitivity High Efficiency Rectifier for Energy Harvesting"
Liew Vui Yong	Intel Corporation, Malaysia	"Advancement of Research in the Area of AI and 5G Opening Up New Way of Living, New Opportunities and New Product"
Cheng Boon Seng	Malaysia Robotics and Automation Society	"Artificial Intelligence: The Chronology: Its Opportunities, Challenges, and Risks"
Kalai Selvan Subramaniam	Infinecs Systems Sdn. Bhd., Malaysia	"Talent Recruitment for IR4 and Beyond"
Dr. Colin Chee	Motorola Solutions, Malaysia	"Voltage Versus Current Mode Direct Conversion Receiver"
Dr. Ong Sze Wei	Intel Corporation, Malaysia	"Developing the Innovation Capabilities for Engineering Advancements"
Mark Wong	QRF Solutions Sdn. Bhd., Malaysia	"Lowering the Risk of Analog IPs Through Design Automation and Smart Integration"
<b>MTT-S Track</b>		
Prof. Lim Eng Hock	Universiti Tunku Abdul Rahman, Malaysia	"Recent Trends and Design Considerations of Passive UHF RFID Tags"
Prof. Widad Ismail	Universiti Sains Malaysia	"Convergence of Industrial Internet of Things Toward Technology Humanization"
Dr. Wong Peng Wen	FILPAL Pte. Ltd.	"A Sustainable and Fast Approach to Filter Design for 5G Implementation"
Prof. Tharek A. Rahman	Universiti Teknologi Malaysia	"5G Mobile Communication: Evolution or Revolution"
Dr. Soh Ping Jack	Universiti Malaysia Perlis	"Wearable Antennas: Innovative Designs, Materials, and Features"
Yeoh Chun Yeow	TM R&D Sdn. Bhd., Malaysia	"5G Building Blocks for IoT Use Case"
Anwar Faizd Osman	Rohde & Schwarz, Malaysia	"The Study of Electromagnetic Compatibility Between 5G and Fixed Satellite Services Operating in C-Band in Malaysia"
<b>EDS Track</b>		
Prof. (Dr.) V.R. Singh	National Physical Laboratory, India	"Advanced Electronic Sensing Systems and Devices in Ubiquitous Health Care"
Dr. P. Sushitha Menon	Universiti Kebangsaan Malaysia	"Angular Interrogation Sensing in Visible Wavelengths Using K-SPR"
Dr. John Tan Teng Hwang	SilTerra, Malaysia	"The Next Generation Sensors for IoT Applications": MEMS on CMOS
Prof. Seiji Samukawa	Tohoku University, Japan	"Creating Green Nanostructures and Nanomaterials for Advanced Energy Nanodevices"
Prof. Aimin Song	University of Manchester, United Kingdom	"Ultrafast Graphene Electronic Devices"
Ir. Dr. Lim Kok Sing	Universiti Malaya, Malaysia	"Optical Fiber Devices and Instruments for Biomedical Applications"
Ravisangar Muniandy	Semiconductor quality/reliability consultant, Malaysia	"New MOSFET Design, Test, Quality, and Reliability Challenges Arising From Latest Trends in Deep Nanometer Transistor and Voltage Scaling"

the Penang 2030 transformation plan, which focuses on increasing quality of life, upgrading the economy, empowering the people, and investing in the environment. According to Zakiyud-

in, the electrical and electronic (E&E) industry is a key enabler of emerging AI, 5G, and IoT technologies. Today, the E&E industry remains one of the most important pillars in Malaysia's

export-driven economy. He also highlighted that, in 2018, Penang contributed close to 30% of Malaysia's total export and 79% of Malaysia's total trade surplus. This achievement would not



Dr. Wong Peng Wen (left) presenting a certificate of appreciation to keynote speaker Prof. Tharek Abdul Rahman.



An exhibition tour.



Participants (from left) include IMESS 2019 Chair Ir. Dr. Lee Choo Yong, IEEE Penang Chapter Vice Chair Dr. Jagadheswaran Rajendran, Chair Ir. Bernard Lim, and keynote speaker Prof. Ewe Hong Tat.



The finalists and judges of the design competition co-organized with FILPAL.



Ir. Bernard Lim (right) awarding a certificate of appreciation to keynote speaker Prof. Cor Claeys.



IMESS 2019 Secretary Lance Lai (left) presenting a certificate of appreciation to Prof. Seiji Samukawa.

have been possible except for the hard work of all the stakeholders that have built a thriving ecosystem in the state by focusing on cutting-edge technologies and high-value jobs. He expressed his hope that Penang's presence in the global scene of electronic manufacturing services, research and development, assembly, and testing of various electronic products will continue to drive Malaysia's economy and create skilled job opportunities.

Following the opening ceremony, IEEE Penang Chapter Chair Ir. Bernard

Lim, IMESS 2019 Chair Ir. Dr. Lee Choo Yong, and Muhamed Ali Hajah Mydin accompanied Zakiyuddin on an exhibition tour and press conference. Zakiyuddin was impressed with the products and portfolios showcased by exhibitors such as RFID tags, flexible circuits, application-specified IC design, and complete solutions for Industry 4.0 implementation.

The second day of the symposium kicked off with a keynote speech by Prof. Cor Claeys of Katholieke Universiteit Leuven (KU Leuven). The FILPAL

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design challenge demo and prize presentation were held during the tea break and the closing of symposium, respectively. The FILPAL design winners were as follows:

- First Prize: Dr. Siti Zuraidah Ibrahim and her Ph.D. student
- Second Prize: Ng Guan Shen
- Third Prize: David Bong.

In parallel, a 20-student delegation from USM led by Ir. Dr. Khor Jeen Ghee and Azwati Azmin paid a technical visit to the Penang Design Center of the Plexus Islandview plant. The symposium adjourned at 4:30 p.m. with closing remarks by Ir. Bernard Lim. Ir. Lim extended gratitude to PSDC, sponsors, and participants for their support in making IMESS 2019 a successful event.

—Lee Choo Yong and  
Lai Menn Tatt



The presentation of a souvenir to Deputy Chief Minister 1 Zakiyuddin.



The USM student technical visit to the Penang Design Center of the Plexus Islandview plant, led by Ir. Dr. Khor Jeen Ghee and Ms. Azwati Azmin.