

CONFERENCE PROGRAM

2023 IEEE CONFERENCE ON ENERGY CONVERSION

CENCON2023

23rd - 24th October 2023

Imperial Hotel Kuching, Kuching, Sarawak, Malaysia

<https://attend.ieee.org/cencon-2023>

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MESSAGE FROM THE CHAIRS

With immense pleasure, we extend a warm welcome to Kuching, Sarawak for the 6th IEEE Conference on Energy Conversion (CENCON 2023), taking place at the Imperial Hotel on October 23-24, 2023. Our mission is to be at the forefront of sharing cutting-edge research in electrical energy conversion, spanning power engineering, power electronics and drives, and high voltage engineering. This conference not only facilitates knowledge exchange but also offers the chance to explore the enchanting land of Sarawak, often referred to as the "Land of Hornbills."

CENCON 2023 is jointly organized by the IEEE Malaysia Power Electronics (PELS) Chapter and co-organized by the Power Electronics and Drives Research Group (PEDG), Universiti Teknologi Malaysia (UTM) and the Department of Electrical and Electronics Engineering, Universiti Malaysia Sarawak (UNIMAS). We are delighted to have the technical co-sponsorship of the Korean Institute of Power Electronics (KIPE) and the generous support of the Sarawak Tourism Board and Genetron Sdn Bhd as our Platinum Sponsor.

We are honored to introduce two distinguished keynote speakers, namely Prof Ir Dr Nasrudin Abdul Rahim, a renowned expert in power electronics from the University of Malaya, Malaysia, and Prof Dr Kai Sun from Tsinghua University, China, an authority in hybrid dc/ac microgrid and also the PEL Asia Pacific Regional Vice Chair.

The conference promises a dynamic blend of technical paper presentations and product exhibitions. To date, we have received over 56 submissions from 17 countries. Each paper underwent rigorous peer review by 100 experts in their respective fields, resulting in an acceptance rate of 71.4% for oral presentations.

Once again, we extend a warm invitation to all delegates and their companions to explore the vibrant city of Kuching, Sarawak. We eagerly anticipate engaging in fruitful technical discussions and the exchange of innovative ideas. Following the conference, we encourage you to extend your stay to savor the many captivating attractions in the city and throughout Malaysia.

Selamat Datang!

Shahrin Md Ayob
Ramani Kannan

CENCON 2023 General Chairs

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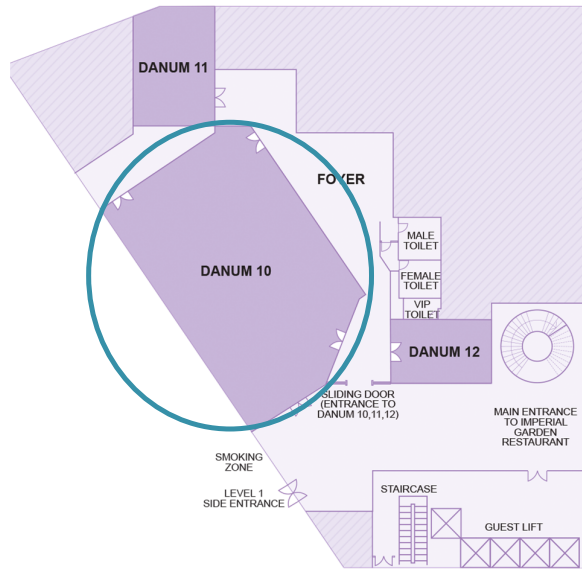
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FLOOR PLAN FOR CONFERENCE EVENT

IMPERIAL HOTEL KUCHING

LEVEL 1 FUNCTION ROOM'S LAYOUT

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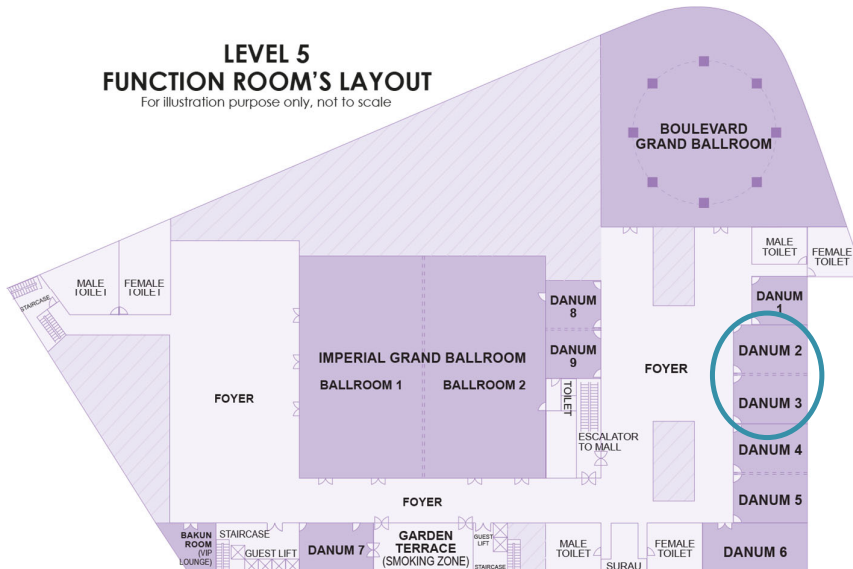


VENUE FOR KEYNOTE &
GALA DINNER

Danum 10, Level 1

LEVEL 5 FUNCTION ROOM'S LAYOUT

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VENUE FOR ORAL
PRESENTATION

Danum 2 & Danum 3,
Level 5

PROGRAM OVERVIEW

CENCON 2023

23 OCTOBER 2023, MONDAY

0800-0845	Registration
0845-0900	Opening Ceremony & Speech by General Chair
0900-0950	Keynote 1 : Professor Dr. Nasrudin Bin Abd Rahim
0950-1040	Keynote 2 : Professor Dr. Kai Sun
1040-1110	Tea Break
1115-1235	Session 1A & Session 1B
1300-1400	Lunch
1400-1520	Session 2A & Session 2B
1520-1550	Tea Break
1550-1700	Session 3A & Session 3B
:	:
1930	Gala Dinner + Best Paper Award Announcement

24 OCTOBER 2023, TUESDAY

0900-1020	Session 4A & Session 4B
1020-1050	Tea Break
1050-1150	Session 5A & Session 5B
1300-1400	Lunch

TECHNICAL PROGRAM

23 Oct 2023, Monday

REGISTRATION

Date: **23 Oct 2023, Monday**
Time: **0800-0845**

KEYNOTE SESSION

Keynote Chair: **Dr Norjulia Mohamad Nordin**
Date: **23 Oct 2023, Monday**
Time: **0845-1040**
Venue: **Danum 10, Level 1**

0845-0900 Welcoming speech

0900-0945 Keynote Address 1
A New Era of Power Electronics in Malaysia: Research Challenges
Professor Ir. Dr. Nasrudin Bin Abd Rahim (Universiti of Malaya, Malaysia)

0945-1040 Keynote Address 2
Hybrid AC/DC Microgrids: Configuration, Control and Future Development
Professor Dr. Kai Sun (Tsinghua University, China)

SESSION 1A Control of Electrical Drives 1

Session Chairs: **Shahrin Md Ayob & Yanuar Zulardiansyah Arief**
Date: **23 Oct 2023, Monday**
Seminar Room: **Danum 2, Level 5**

1115-1135 **S1A.1**
Analysis of Switching Loss Based on Gate Resistance in a SiC MOSFET Inverter
Mun-Gyeom Park; Kyo-Beum Lee

1135-1155 **S1A.2**
A Speed Synchronization Strategy for a MIDP Surface-Mounted Permanent Magnet Synchronous Motor Drive System
Gi-Jung Nam; Kyo-Beum Lee

1155-1215 **S1A.3**
A DC-Link Ripple Current Reduction Method Based on Variable Switching Sequences for Three-Level NPC Inverters
Yunjae Bae; Kyo-Beum Lee

1215-1235 **S1A.4**
 Explainable Machine Learning Method for Open Fault Detection of NPC Inverter Using SHAP and LIME
Hasan Ali Alkaf; Kyo-Beum Lee

SESSION 1B Renewable Energy Systems 1
 Session Chairs: **Tan Chee Wei & Jasrul Jamani Jamian**
 Date: **23 Oct 2023, Monday**
 Seminar Room: **Danum 3, Level 5**

1115-1135 **S1B.1**
 Implementation of a Collapsible Solar Power Station for Farm Irrigation
Anton Louise P. De Ocampo; Mark Justine Domingo; Melmar Eje; John Miko Malinao

1135-1155 **S1B.2**
 Up-Conversion Nanoparticle Perovskite Photovoltaic Device Under Indoor LED and Outdoor Local Spectral Irradiances
Kok keong Chong; Son Qian Liew; Tonni Agustiono Kurniawan

1155-1215 **S1B.3**
 Preparation and Performance Characteristics of Reduced Graphene Oxide-Based Electrolytes of Vanadium Redox Flow Battery for Green Energy Storage
Md Hasnat Hossain; Md Showkot Hossain; Mohd Amran Mohd Radzi; Saidur Rahman; Chinmay Biswas; Suhaidi Shafie

1215-1235 **S1B.4**
 Operational Strategy of a Hybrid Renewable Energy System With Hydrogen-Battery Storage for Optimal Performance Using Levy Flight Algorithm
Babangida Modu; Md Pauzi Abdullah; Abdulrahman AlKassem; Abba Lawan Bukar; Nur Hazirah Zainal

SESSION 2A Power Electronics Converters
 Session Chairs: **Mohd Junaidi Abdul Aziz & Kyo-Beum Lee**
 Date: **23 Oct 2023, Monday**
 Seminar Room: **Danum 2, Level 5**

1400-1420 **S2A.1**
 Reduced Device Count Multilevel Inverter Topology for Renewable Energy Applications: A Brief Review
Md Showkot Hossain; Md Akib Hasan; Nurul Ain Mohd Said; Wahidah Abd. Halim; Auzani Jidin

1420-1440 **S2A.2**
 Asymmetric 21-Level Inverter Topology With Reduced Device Count for Medium and High Power Renewable Applications
Uvais Mustafa; M Saad Bin Arif; Shahrin Md. Ayob; Hasmat Malik; Mohd Faisal Jalil; Khan Mohammad

1440-1500 **S2A.3**
 State of Charge Estimation of Second Life Batteries Using First Order Thevenin Model
Masoud Albasheer Sahhouk; Mohd Junaidi Abd Aziz; Mohd Ibthisham

1500-1520 **S2A.4**
 Investigation of a Spiral Planar Coil on Coreless Axial Flux PM Generator for Pico-Hydro Applications
Isiaka Shuaibu; Eric Tatt Wei Ho

SESSION 2B Electric Vehicles

Session Chairs: **Nik Rumzi Nik Idris & Hasmat Malik**

Date: **23 Oct 2023, Monday**

Seminar Room: **Danum 3, Level 5**

1400-1420 **S2B.1**
 Design and Simulation of a Bidirectional DC-DC Converter With PI Controller for Regenerative Braking in Electric Vehicles
Ramani Kannan; Karantharaj Porkumaran; Komathi C; Nursyarizal Bin Mohd Nor; Sanjeevi Gandhi A

1420-1440 **S2B.2**
 Optimal Placement of Fast Charging Station in Radial Distribution Networks Through Particle Swarm Optimization
Wang Xingye; Hadi Nabipour Afrouzi; Chen Rui Geach; Ramani Kannan; Kamyar Mehranzamir; Dai Xinyue

1440-1500 **S2B.3**
 Comparative Analysis of Passive and Semi-Active Hybrid Energy Storage System Topologies for Electric Vehicle
Mohammad Hashim Saleh Al Takroui; Shahrin Md. Ayob; Nik Rumzi Nik Idris; Mohd Junaidi Abdul Aziz; Razman Ayop; Mohd Farid Muhamad Said

1500-1520 **S2B.4**
 Utilizing Energy Storage System for Three-Level Voltage Balancing Mechanism in Electric Vehicle Fast Charging Station
Hadi Nabipour Afrouzi; Covington Kua; Ramani Kannan; Kamyar Mehranzamir

SESSION 3A Renewable Energy Systems 2Session Chairs: **Hasmat Malik & Mohd Rodhi Sahid**Date: **23 Oct 2023, Monday**Seminar Room: **Danum 2, Level 5**

- 1550-1610 **S3A.1**
Comparative Studies on Different Time Series Models for Wind Power Generation Forecasting
Anton Louise P. De Ocampo; Alvin Sarraga Alon; Gerard Francesco DG. Apolinario; Dylan Josh D Lopez; Enrique Festijo; Jeffrey Sarmiento; Jonathan V. Taylar; Maria Cecilia Venal
- 1610-1630 **S3A.2**
Control Strategy of Hybrid PV/ FC/ Battery System for A Malaysian Household Application
Chen Rui Geach; Siti Maherah Hussin; Hadi Nabipour Afrouzi; Kamyar Mehranzamir; Norzanah Rosmin; Madihah Md Rasid
- 1630-1650 **S3A.3**
Harmonic Reduction for Various Nonlinear Load Using Active Filter
Rasyidah Mohamad Idris; AbdulRahman Galadima; Mohd Habibuddin; Syed Norazizul Syed Nasir

SESSION 3B Power Engineering Systems 1Session Chairs: **Nik Din Muhamad & Ramani Kannan**Date: **23 Oct 2023, Monday**Seminar Room: **Danum 3, Level 5**

- 1550-1610 **S3B.1**
Improving Resilience Index Quantification Using Weighted Sum Method
Hasna Satya Dini; Jasrul Jamani Jamian; Eko Supriyanto
- 1610-1630 **S3B.2**
Optimizing Zone Compliance for Distance Relay in Transmission Lines With Installed FACTS Devices
Jalal Tavalaei; Hadi Nabipour Afrouzi; Mohammad Sanjari; Ehsan Barmala; Abdolreza Javanmardzadeh; Mohd Habibuddin
- 1630-1650 **S3B.3**
VSI Improvement by Optimally Placing and Sizing SVC in Distribution System With Employing Metaheuristic Technique
Muhammad Adam Mohd Nadzri; Syed Norazizul Syed Nasir; Jasrul Jamani Jamian; Rasyidah Mohamad Idris; Madihah Md Rasid

24 Oct 2023, Tuesday

SESSION 4A Renewable Energy Systems 3Session Chairs: **Mohd Zaki Daud & Hazrul bin Mohamed Basri**Date: **24 Oct 2023, Tuesday**Seminar Room: **Danum 2, Level 5**

- 0900-0920 **S4A.1**
Analytical Hierarchy Process (AHP) Analysis for Load Shedding Scheme in Islanded Distribution System Connected With Mini Hydro Generation
Norazliani Binti Md sapari; Mohd Rohaimi Mohd Dahalan; Madihah Md Rasid; Mohd Zaki Daud
- 0920-0940 **S4A.2**
Development of a Fuel Cell Energy Controller Design for an Electric Vehicle Engine via a PID-PSO Robust Control Algorithm
Ali K Murad; Elif Altürk; Ahmed Al-Araji
- 0940-1000 **S4A.3**
Enhancing Solar Microgrid Efficiency and Reliability Through Smart Energy Management Systems
Hasmat Malik; Mohd Junaidi Abdul Aziz; Salwan Tajjour; SS Chandel
- 1000-1020 **S4A.4**
Experimental Investigation of Photovoltaic-Integrated Thermoelectric Cooling System for Enhancing Power Generation Under Real Outdoor Conditions
Rahul Chandel; Ram Prakash Dwivedi; Deo Prasad; SS Chandel; Hasmat Malik; Razman Ayop

SESSION 4B Control of Power Electronics 2Session Chairs: **Mohd Rodhi Sahid & Kismet Anak Hong Ping**Date: **24 Oct 2023, Tuesday**Seminar Room: **Danum 3, Level 5**

- 0900-0920 **S4B.1**
Refined Sensorless-Based ILC Approach for Permanent Magnet Synchronous Motors
Sadeq Ali Qasem Mohammed; Hasan Ali Alkaf; Kyo-Beum Lee
- 0920-0940 **S4B.2**
Accurate Simplified SPWM Control Strategy for Single-Phase Voltage Source Inverter Under Varying Grid Conditions
Noor Syafawati Ahmad; Noor Aqilah Madzlan; Jenn Hwai Leong; Ahmad Afif Nazib
- 0940-1000 **S4B.3**
Simplified SVPWM Technique for Ripple-Free Voltage and Current Control in Flying Capacitor of Five-Level Hybrid ANPC Converters
Samer Saleh Hakami; Kyo-Beum Lee

1000-1020 **S4B.4**
 Development of Adaptive Fuzzy PID Controller Integrated With Slide Mode Control for Brushless Direct Current Motors
Dai Xinyue; Norjulia Mohamad Nordin; Hadi Nabipour Afrouzi; Chen Rui Geach; Wang Xingye; Jalal Tavalaei

SESSION 5A Power Engineering Systems 2
 Session Chairs: **Awang Jusoh & Syed Norazizul Syed Nasir**
 Date: **24 Oct 2023, Tuesday**
 Seminar Room: **Danum 2, Level 5**

1050-1110 **S5A.1**
 Voltage Stability Assessment for Load Shedding Distribution
Michelle Lu; Lo Tzu Hsiung

1110-1130 **S5A.2**
 Real-Time Simulation of SVC on Multi-Machine -9 Bus System
Hasmat Malik; Anjali Atul Bhandakkar; Mohammad Junaid Khan; Mohd Junaidi Abdul Aziz; Lini Mathew

1130-1150 **S5A.3**
 Insulator Defect Detection in Power Lines Based on Improved Convolution Neural Network
Annie Joseph; Mohd Rahul Bin Mohd Rafiq; Kuryati Kipli; Kho Lee Chin; Tengku Mohd Afendi Zulcaffle; Charlie Chin Voon Sia

SESSION 5B High Voltage and Electrical Insulation
 Session Chairs: **Naziha Ahmad Azli & Norjulia Mohamad Nordin**
 Date: **24 Oct 2023, Tuesday**
 Seminar Room: **Danum 3, Level 5**

1050-1110 **S5B.1**
 Atmospheric Pressure Plasma Jet Assisted by Magnetic Field: A Simulation Study
Mohd Hafizi Ahmad; Nik Muhammad Azzim Addin Jalaludin; Azfar Satari Abdullah; Norhafezaidi Mat Saman

1110-1130 **S5B.2**
 Effects of External Permanent Magnet on Atmospheric Pressure Plasma Jet: An Experimental Study
Mohd Hafizi Ahmad; Azfar Satari Abdullah; Norhafezaidi Mat Saman; Ahmad Muqri Hadri Md Nordin

1130-1150 **S5B.3**
 Development of Condition Assessment Criteria for Medium Voltage Underground Cable Water Ingress Joint Using Combined Diagnostic Testing
Tashia Anthony; Azrul Mohd Ariffin; Suhaila Sulaiman; Nik Hakimi Nik Ali

THANK YOU