11TH INTERNATIONAL CONFERENCE ON INNOVATIVE SMART GRID TECHNOLOGIES (ASIA)

1 - 5 November 2022, Marina Bay Sands, Singapore

IEEE ISGT-Asia 2022

CONFERENCE PROGRAMME BOOKLET

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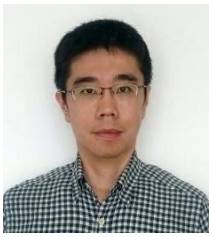

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Time	Tuesday, 1 November 2022
11:30AM to 12:00PM	**Registration (Outside Melati Rooms)**
12:00PM to 1:00PM	**Lunch (Foyer)**
1:00PM to 3:00PM	**Tutorial #1 How to develop cloud computing frameworks for using real-time data streams in large-scale distribution system simulations** Dr. Sayonsom Chanda (Melati 4101AB)
3:00PM to 3:30PM	**Break (Foyer)**
3:30PM to 5:30PM	**Tutorial #2 Machine learning and optimization for smart grid** Prof. Yan Zhang and Dr. Yusuha Li (Melati 4101AB)
5:30PM to 6:00PM	**Registration (Outside Melati Rooms)**
6:00PM to 8:00PM	**Welcome Reception (Foyer)**

Time	Wednesday, 2 November 2022			
8:00AM to 8:30AM	**Registration (Outside Melati Rooms)**			
8:30AM to 9:00AM	**Opening Ceremony (Plenary room)**			
9:00AM to 9:45AM	**Keynote #1 Prof. Saifur Rahman (Plenary room)**			
9:45AM to 10:30AM	**Keynote #2 Dr. Jessica Bian (Plenary room)**			
10:30AM to 11:00AM	**Break (Foyer)**			
11:00AM to 11:45AM	**Keynote #3 Prof. Claudio Canizares (Plenary room)**			
11:45AM to 12:45PM	**Panel Session #1 Utility of the Future (Plenary room)**			
12:45PM to 2:00PM	**Lunch (Lunch Room)**			
2:00PM to 3:30PM	**OS 1 (Melati 4101AB)**	**OS 2 (Melati 4102)**	**OS 3 (Melati 4002)**	**Poster Session (Foyer)**
3:30PM to 4:00PM	**Break (Foyer)**			
4:00PM to 5:00PM	**OS 4 (Melati 4101AB)**	**OS 5 (Melati 4102)**	**OS 6 (Melati 4002)**	
5:00PM to 6:00PM			**OS 7 (Melati 4002)**	

Session No.	Session Title	Session Chair
OS 1 (Track 1)	System planning and operation with high renewable penetrations (Part 1)	Dr. Jimmy Peng
OS 2 (Track 3)	Stability analysis of low-inertia grids	Dr. Muhammad Ramadan Saifuddin
OS 3 (Track 4)	Artificial intelligence for grid resilience enhancement	Dr. Daisuke Mashima
OS 4 (Track 1 & 2)	System planning and operation with high renewable penetrations (Part 2)	Dr. Muhammad Ramadan Saifuddin
OS 5 (Track 3)	Renewable generation and low-inertia grid	Dr. Gurupraanesh Raman
OS 6 (Track 5)	Grid-edge systems and technologies (Part 1)	Dr. Gururaghav Raman
OS 7 (Track 6)	Electricity market, innovative business mechanism, policy/regulatory aspects (Part 1)	Dr. Jimmy Peng
Poster Session	Poster Session for all tracks	Dr. Dhivya Sampath Kumar Dr. Anupam Trivedi

Time	Thursday, 3 November 2022		
8:30AM to 9:45AM	**Registration (Outside Melati Rooms)**		
9:45AM to 10:30AM	**Keynote #4 Dr. Thoms Reindl (Plenary room)**		
10:30AM to 11:00AM	**Break (Foyer)**		
11:00AM to 11:45AM	**Keynote #5 Prof. Nando Ochoa Pizzali (Plenary room)**		
11:45AM to 12:45PM	**Panel Session #2 by Hatch and SIT (Plenary room)**		
12:45PM to 2:00PM	**Lunch (Lunch Room)**		
2:00PM to 3:30PM	**OS 8 (Melati 4101AB)**	**OS 9 (Melati 4102)**	**OS 10 (Melati 4002)**
3:30PM to 4:00PM	**Break (Foyer)**		
4:00PM to 5:00PM	**Panel Session #3 IEEE WIE (Melati 4101AB)**	**OS 11 (Melati 4102)**	**OS 12 (Melati 4002)**
5:00PM to 6:00PM	**Panel Session #4 IEEE YP, Best Paper/Poster Awards (Melati 4101AB)**		**OS 13 (Melati 4002)**
6:00 PM to 9:00 PM	**Banquet (Marina Bay Sands)**		

Session No.	Session Title	Session Chair
OS 8 (Special Sessions 1 & 2)	Artificial intelligence and cloud based smart technologies in modern grids	Dr. Mazheruddin Syed
OS 9 (Track 3)	Electric vehicles	Dr. Elsa Feng
OS 10 (Special Session 6)	Topical developments of power electronics converter in system resilience enhancement	Dr. Dhivya Sampath Kumar Dr. Nitin Gupta
OS 11 (Special Session 5)	Toward digitalized microgrids with blockchain, data driven techniques, and cyber-resilience enhancement methods	Dr. Pengfeng Lin
OS 12 (Track 1)	Applications of optimization techniques for planning and operation of modern grids	Dr. Yan Xu
OS 13 (Track 5)	Grid-edge systems and technologies (Part 2)	Dr. Jimmy Peng

Time	Friday, 4 November 2022		
8:30AM to 9:00AM	**Registration (Outside Melati Rooms)**		
9:00AM to 9:45AM	**Keynote #6 Prof. Ron Hui (Plenary room)**		
9:45AM to 10:30AM	**Keynote #7 Dr. Amit Gupta (Plenary room)**		
10:30AM to 11:00AM	**Break (Foyer)**		
11:00AM to 12:00PM	**Panel session #5 "Urban Microgrids" by PRIMO Consortium (Plenary room)**		
12:00PM to 1:00PM	**OS 14 (Melati 4101AB)**		**OS 15 (Melati 4002)**
1:00PM to 2:00PM	**Lunch (Foyer)**		
2:00PM to 3:30PM	**OS 16 (Melati 4101AB)**	**OS 17 (Melati 4102)**	**OS 18 (Melati 4002)**
3:30PM to 4:00PM	**Break (Foyer)**		
4:00PM to 5:00PM	**Panel Session #6 SPECS Consortium (Melati 4101AB)**	**OS 19 (Melati 4102)**	
5:00PM to 6:00PM			

Session No.	Session Title	Session Chair
OS 14 (Track 5 & Special Session 3)	Grid-edge systems and technologies (Part 3)	Dr. Elsa Feng
OS 15 (Track 1)	Uncertainty handling in modern power grids	Dr. Anupam Trivedi
OS 16 (Special Session 8)	Energy transition strategies, and environmental and climatic benefits of pushing forward net zero target	Dr. Anupam Trivedi
OS 17 (Track 6)	Power electronic converters in power grids	Dr. Elsa Feng
OS 18 (Special Session 4)	Coordinated operation of active distribution networks	Dr. Wei Lin
OS 19 (Tracks 1 and 6)	Electricity market, innovative business mechanism, policy/regulatory aspects (Part 2)	Dr. Jaydeep Saha

Time	Saturday, 5 November 2022
9:00AM to 9:45AM	**Travel to Nanyang Technological University (NTU)**
9:45AM to 11:15AM	**Lab Tours: Rolls-Royce@NTU Corporate Lab and SP Group - NTU Joint Lab**
11:15AM to 12:30PM	**NTU Campus Tour**
12:30PM to 1:15PM	**Lunch at NTU**
1:15PM to 2:00PM	**Return back to MBS Conference Venue**

ISGT Asia 2022

Technical Programme Schedule

Technical Programme Schedule for 1 Nov 2022 (Tuesday)

Tutorial 1

Time: 1:00 pm - 3:00 pm	How to develop cloud computing frameworks for using real-time data streams in large-scale distribution system simulations Presenter: Dr. Sayonsom Chanda Venue: Melati 4101AB

Tutorial 2

Time: 3:30 pm - 5:30 pm	Machine learning and optimization for smart grid Presenters: Prof. Yan Zhang and Dr. Yushua Li Venue: Melati 4101AB

Technical Programme Schedule for 2 Nov 2022 (Wednesday)

Opening ceremony

Time: 8:30 am - 9 am	Opening ceremony Venue: Plenary room

Keynote 1

Time: 9 am - 9:45 am	Keynote: “Challenges and Opportunities of Decarbonization in the Global Electric Power Sector” by Prof. Saifur Rahman Venue: Plenary room

Keynote 2

Time: 9:45 am - 10:30 am	Keynote: “Grid Resilience and Metrics” by Dr. Jessica Bian Venue: Plenary room

Keynote 3

Time: 11 am - 11:45 am	Keynote: “Microgrid Overview and Research” by Prof. Claudio Canizares Venue: Plenary room

Panel Session 1

Time: 11:45 am - 12:45 pm	Industry Panel: Global Perspectives—Utility of the future Venue: Plenary room

Oral Session OS 1 (2 Nov 2022, 2 pm - 3:30 pm)

Topic: System planning and operation with high renewable penetrations (Part 1)

Venue: Melati 4101AB

Chair: Dr. Jimmy Peng

Paper ID	Title and authors
13	**Reconfiguration Based Load Restoration in Active Distribution Networks with A Voltage Frequency Dependent Load Model** Ruipeng Xu, Cuo Zhang and Zhaoyang Dong
22 (Best Paper Award Candidate)	**Value-Based Expansion Planning in Storage-Concerned Distribution Networks** Wei Lin, Zixu Wang, Zhifang Yang and Alexander A Vasin
27 (Best Paper Award Candidate)	**Cyber-Physical Co-Simulation Testbed for Real-Time Reactive Power Control in Smart Distribution Network** Raju Wagle, Gioacchino Tricarico, Francisco Gonzalez-Longatt, Pawan Sharma, Charu Sharma and Jose Luis Rueda
50	**Joint Renewable Generation Maximization and Radial Distribution Network Reconfiguration** Kin Cheong Sou and Kenny Giron
93	**A New Monitoring and Control Method for Improving Voltage Stability Margin** Naoki Kono, Naoto Yorino, Yutaka Sasaki, Naoki Inoue, Yoshifumi Zoka, Ahmed Bedawy and Hajime Yasuda
95	**Multi-Application Battery Energy Storage Systems for Energy Arbitrage and Frequency Regulation: Singapore Context Analysis** Sajitha K. Nair, Katayoun Rahbar, Peng Peng and Albert Albert

Oral Session OS 2 (2 Nov 2022, 2 pm - 3:30 pm)

Topic: Stability analysis of low-inertia grids

Venue: Melati 4102

Chair: Dr. Muhammad Ramadan Saifuddin

Paper ID	Title and authors
26	**Impact of High Intermittent PV Systems on the System Frequency and Rate of Change of Frequency in Malaysia** Xie Cherng Miow, Yun Seng Lim, Lee Cheun Hau, Jianhui Wong and Haris Patsios
34	**Inertia Estimation for Interconnected Networks and its Application to the Uruguayan Power System** Octavio J. Rodriguez, Alvaro D. Giusto and Aldo S. Rondoni
59 (Best Paper Award Candidate)	**Resilience-oriented Modeling and Co-optimization for Coupled Power and Water Distribution Systems** Yesen Yang and Edmond Y.M. Lo
69	**Enhancement of Volt-VAR Control Using Voltage Sensitivity in Grid-Connected Photovoltaics System** Sandro Sitompul, Ken Shimomukai and Goro Fujita
100	**Transient stability improvement of Croatian power system using FACTS** Anica Šešok and Ivica Pavić

Oral Session OS 3 (2 Nov 2022, 2 pm - 3:30 pm)

Topic: Artificial intelligence for grid resilience enhancement

Venue: Melati 4002

Chair: Dr. Daisuke Mashima

Paper ID	Title and authors
37	**A Reinforcement Learning-based Volt-VAR Control Dataset and Testing Environment** Yuanqi Gao and Nanpeng Yu
51	**Adversarial Attacks on Deep Neural Network-based Power System Event Classification Models** Yuanbin Cheng, Koji Yamashita and Nanpeng Yu

84	**Data-Driven Ice Blockage Estimation of Water Intake at Niagara Hydropower Station** Koji Yamashita and Nanpeng Yu
97 (Best Paper Award Candidate)	**Critical Load Identification for Load Redistribution Attacks** Praveen Verma, Sagar Gupta, Pallab Dasgupta and Chandan Chakraborty
182	**Higher Training Size, Increased Model Complexity or Both: A Novel Decision Framework for Cycle Life Classification of Lithium-Ion Cells** Muhammad Osama Tarar, Naveed UL Hassan and Ijaz Haider Naqvi

Poster Session (2 Nov 2022, 2 pm - 3:30 pm)

Venue: Foyer

Chair: Dr. Dhivya Sampath Kumar and Dr. Anupam Trivedi

Paper ID	Title and authors
39	**Zonal Day-Ahead Energy Market: A Modified Version of the IEEE 39-bus Test System** Gioacchino Tricarico, Raju Wagle, Maria Dicorato, Giuseppe Forte, Francisco Gonzalez-Longatt and Jose Luis Rueda
55	**Harmonic Analysis of Grid-Connected Inverters Based on Symmetrical Components** Kenichiro Sano and Wanbin Xing
63	**A Novel Preventive Frequency Stability Constrained OPF Considering Wind Power Fluctuation** Sangwon Kim
85	**Detection of Bad Data and False Data Injection Based on Back-Propagation Neural Network** Shiqi Li and Yinghui Han
86	**Effect of Using Battery Energy Storage System in Merit-Order Based Load Frequency Control Considering Change in Area Control Error** Masaru Saida, Naoki Sasada, Masaki Imanaka and Takeyoshi Kato
89	**Detection of Bad Data and Cyber Attacks in State Estimation using Support Vector Machine**

	Yinghui Han and Shiqi Li
107	**Effect of La Niña weather conditions on operation of a future 100% renewable grid in Australia** Lucy Roberts, Bin Lu and Kylie Catchpole
110	**The Resilience of The Grid from The Risk of Failure Due to Kite Thread Disturbance Case Study Khatulistiwa Grid** Sudarmono MOO Sasmono
117	**Conservation Voltage Reduction using Submersible Transformer Integrated with OLTC and Monitoring System** Supakit Chotigo and Prajak Kittirattanaviwat
181	**Control Structure Related Admittance-Shaping Effects in VSM Controlled Converters** Carolin I. Hirsching, Marco Lindner, Alexander Bisseling, Michael Suriyah and Thomas Leibfried
192	**Battery based Renewable Energy Source Grid-connected Generation System with Improved Power Quality Feature** Anurag Tiwari and Ruchi Agarwal
193	**Harnessing Resource and Demand Flexibility for Energy Management in Urban Micro-grids** Lalitha Subramanian, Jiyan Wu, Rudy Tjandra, Sebastian Troitzsch, Tobias Massier, Erine Siew Pheng Teh, Romain Migne and Yan Xu
202	**PV-Grid Interface Hybrid Energy Management System for EV Charging Station without PLL** Rahul Raj Kar and Rupesh Ganpatrao Wandhare

Oral Session OS 4 (2 Nov 2022, 4 pm - 6 pm)

Topic: System planning and operation with high renewable penetrations (Part 2)

Venue: Melati 4101AB

Chair: Dr. Muhammad Ramadan Saifuddin

Paper ID	Title and authors
76	**Stability Comparison Between AC and DC Microgrids Applying Sensitivity Analysis** Yuchen Zhang and Cao Jiahui
101	**Three-Phase SRF PLL Model for System Frequency Response Studies in Low-Inertia Systems** Matej Krpan, Igor Erceg, Igor Kuzle and Hrvoje Pandžić
120	**Offshore Wind Grid Integration – A Techno-Economic Comparison of MVDC and HVAC** Phuong Hong Nguyen
129	**Estimation of Maximum Available Power in Solar Photovoltaic Power Plants Under Normal Operation and Cloud Shading** Soudipan Maity, Zakir Hussain Rather and Suryanarayana Doolla
170	**A Linear Probabilistic Optimal Power Flow Model with Linearization Error Checking** Zhentong Shao, Qiaozhu Zhai, Yan Xu and Xiaohong Guan
174	**A Machine Learning Based Approach for Frequency Response Prediction in Low Inertia Power System** Akhilesh Panwar, Zakir Hussain Rather, Ariel Liebman, Suryanarayana Doolla and Roger Dargaville
189	**Classification of Strategies Enhancing the Penetration of Electric Vehicles in German Low Voltage Grids** Sina Steinle, Lukas Held, Patrick Vasile, Michael R. Suriyah and Thomas Leibfried

Oral Session OS 5 (2 Nov 2022, 4 pm - 6 pm)

Topic: Renewable generation and low-inertia grid

Venue: Melati 4102

Chair: Dr. Gurupraanesh Raman

Paper ID	Title and authors
40	**System Strength: Classification, Evaluation Methods, and Emerging Challenges in IBR-dominated Grids** Aleksandar Boričić, Jose Luis Rueda Torres and Marjan Popov
92	**Day-ahead Generation Schedule Considering Community Microgrid's Uncertainties** Motonari Satoh, Yutaka Sasaki, Yoshifumi Zoka and Naoto Yorino
141 (Best Paper Award Candidate)	**Fault Current-Constrained Optimal Power Flow on Unbalanced Distribution Networks** Jose Enrique Tabarez, Arthur K. Barnes, Adam Mate and Russell W. Bent
142	**Integration of Pump-Storage Batteries in Offshore Wind Farms: Evaluation of Effects on Power Exchange** Phuong Hong Nguyen
176 (Best Paper Award Candidate)	**Distance protection of inverter based renewables power evacuating lines and downstream network: Issues and mitigation approach** Vedanta Pradhan, Neethu George, OD Naidu, Zoran Gajic and Sinisa Zubic

Oral Session OS 6 (2 Nov 2022, 4 pm - 5 pm)

Topic: Grid-edge systems and technologies (Part 1)

Venue: Melati 4002

Chair: Dr. Gururaghav Raman

Paper ID	Title and authors
75	**Comparative Evaluation of Cyber-Attacks on AC Microgrid Secondary Control** Haoyu Zhang and Zhipeng Yao
88	**Optimal Scheduling in Rural Community Microgrids** Jialun Zhong and Yuxiao Wang

139	**Community Energy Cooperation with Shared Energy Storage for Economic-Environment Benefits** Yinyan Liu, Haoning Xi, Yunqi Wang, Jun Lin and Jin Ma
206	**Coordinated Control of Air-conditioning Load and Battery Energy Storage System for Improving Electricity Supply-demand Balancing** Rajabu Myovela and Kato Takeyoshi

Oral Session OS 7 (2 Nov 2022, 5 pm - 6 pm)

Topic: Electricity market, innovative business mechanism, policy/regulatory aspects (Part 1)

Venue: Melati 4002

Chair: Dr. Jimmy Peng

Paper ID	Title and authors
56 (Best Paper Award Candidate)	**Flexible Stochastic Bilevel Scheduling Strategy in Hydropower Dominated Energy Markets** Abolfazl Khodadadi, Lennart Söder and Mikael Amelin
58	**Daily Generation Schedule Estimation for the Entire Power System Considering Japanese Electricity Markets** Tsubasa Nagae, Taisuke Masuta, Yusuke Manabe and Nobuyuki Yamaguchi
166	**Enabling Trusted Peer-to-Peer Microgrid Energy Transactions during High-Impact Low Probability Weather Events** Lakshita Lakshita and Nirmal Nair

Technical Programme Schedule for 3 Nov 2022 (Thursday)

Keynote 4

Time: 9:45 am - 10:30 am	Keynote: “The impact of resource forecasting on the integration of variable renewable energies into electric power grids” by Dr. Thomas Reindl Venue: Plenary room

Keynote 5

Time: 11 am - 11:45 am	Keynote: “The Future of DER Hosting Capacity and Operating Envelopes” by Prof. Nando Ochoa Pizzali Venue: Plenary room

Panel Session 2

Time: 11:45 am - 12:45 pm	Industry Panel: Hatch and SIT Venue: Plenary room

Oral Session OS 8 (3 Nov 2022, 2 pm - 3:30 pm)

Topic: Artificial intelligence and cloud based smart technologies in modern grids

Venue: Melati 4101AB

Chair: Dr. Mazheruddin Syed

Paper ID	Title and authors
5	**A Review of Machine Learning Applications for Li-Ion Battery State Estimation in Electric Vehicles** Wesley Qi Tong Poh, Yan Xu and Robert Thiam Poh Tan
123	**Hybrid Digital Twin Architecture for Power System Cyber Security Analysis** Vijayakumar Ayyalusamy, Sivaneasan B., Kandasamy NK, Jianfang Xiao, Khalid Abidi and Ambrish Chandra

233	**Distribution Network Characterization for Ancillary Service Provision: Frequency Response through Voltage Control** Maria Robowska, Mazher Syed, Graeme Burt and Yan Xu

Oral Session OS 9 (3 Nov 2022, 2 pm - 3:30 pm)

Topic: Electric vehicles

Venue: Melati 4102

Chair: Dr. Elsa Feng

Paper ID	Title and authors
38	**Modeling of the EV dynamic wireless charging load** Xin Cui, Liang Liang, Wei Liu, Junhong Liu and Yunhe Hou
72	**An EV Charging Scheduling Methodology to Reduce Demand and Energy Charges in Industrial and Commercial Sites** Can Berk Saner, Anupam Trivedi and Dipti Srinivasan
73	**A Vehicle and Charging Scheduling Framework for Campus Shuttle Electric Buses** Can Berk Saner, Raymond Ho Chin Wei, Sayed A. R. Alkaff, Wei Zheng Lee, Yu Wei Lee, Anupam Trivedi and Dipti Srinivasan
197	**Towards Making Intelligent Decisions on SOC Strategies for EV Battery Life Enhancement under Practical DoD Ranges** Ayesha Khan, Ijaz Haider Naqvi and Naveed Ul Hassan
200	**EV Driving Across Seasons: SOC strategies for Higher Battery Life Expectancy** Kashif Raza, Ijaz Haider Naqvi and Naveed Ul Hassan

Oral Session OS 10 (3 Nov 2022, 2 pm - 3:30 pm)

Topic: Topical developments of power electronics converter in system resilience enhancement

Venue: Melati 4002

Chair: Dr. Dhivya Sampath Kumar and Dr. Nitin Gupta

Paper ID	Title and authors
161	**Performance Improvement of Weak Grid Interfaced Microgrid Using Multi Generalized Integrator Controller** Vijayakumar Gali, Prashant Jamwal, Anuar Syzdykov and Arshyn Zhanbolatov
164	**MPC Control for Low Power PV System Against Grid Voltage Disturbances** Mukhtar Turarbek, Vijayakumar Gali and Prashant Jamwal
173	**Implementation of DC-DC Converter using Ultra Capacitor and Digital Controller for Battery Electric vehicle Applications** Chitra Selvi Shokkalingam, Ramani Kannan TS and Sundaramoorthi R
183	**Modified Triple-port Double Boost Switched Inductor based DC-DC Converter for Single Phase PV System** Chitra Selvi Shokkalingam and Kamalathiyagarajan S
194	**Performance Analysis of Grid Connected SPCS under Unbalanced Grid Voltage, Frequency Deviation and Harmonics** Meghraj Morey, Nitin Gupta, ManMohan Garg and AjayKumar Singh

Panel Session 3

Time: 4 pm - 5 pm	IEEE Women in Engineering Venue: Melati 4101AB

Panel Session 4

Time: 5 pm - 6 pm	IEEE Young Professionals Awards for Best Papers and Posters will be handed out in this session. Venue: Melati 4101AB

Oral Session OS 11 (3 Nov 2022, 4 pm - 6 pm)

Topic: Toward digitalized microgrids with blockchain, data driven techniques, and cyber-resilience enhancement methods

Venue: Melati 4102

Chair: Dr. Pengfeng Lin

Paper ID	Title and authors
29	**Tron Blockchain Based Pricing Scheme for Energy Trading Considering Carbon Emissions Taxes** Jiawei Yang, Hongxu Huang, Yiwen Zhang, Jiahong Dai and Hoay Beng Gooi
68	**A Cumulative Modified Weibull Model for Transformer Reliability Analysis Considering Environmental and Operational Factors** Lingfeng Luo, Nan Zhou, Yan Xu and Peng Wang
151	**Efficiency Optimization for Hybrid Si + SiC Neutral-Point-Clamped Dual-Active-Bridge Converter for Energy Storage Systems** Jiaxin Dong, Josep Pou, Suvajit Mukherjee, Amit Kumar Gupta and Yu Zeng
175	**A Confidence-Aware Data-Driven Method for Batch Small-Signal Stability Assessment of Power Systems** Qiaoqiao Li, Rui Zhang and Koh Leong Hai
222	**A Missing Data Tolerance Data-driven Method for Open-Circuit Fault Diagnosis of Three-phase Inverters Based on Random Forest and Resampling Scheme** Yuancheng Su, Yang Xia and Rui Zhang

239	**Model Predictive Control Strategy of Grid-tied Converter control in Weak-Grid conditions for Containerized Microgrid (CMG) Systems** Gaurav Mani Gupta, Suman Mondal and Ali I. Maswood

Oral Session OS 12 (3 Nov 2022, 4 pm - 5 pm)

Topic: Applications of optimization techniques for planning and operation of modern grids

Venue: Melati 4002

Chair: Dr. Yan Xu

Paper ID	Title and authors
3	**A Comprehensive Literature Review for Optimal Planning of Distributed Energy Resources in Distribution Grids** Ruoxuan Leng, Zhengmao Li and Yan Xu
23	**Efficient Clustering of Distributed Energy Resources Minimising Cluster Variances** Jun-Xing Chin and Gabriela Hug
74	**Joint Optimization of Battery Energy Storage and Gas Turbine for Ancillary Service Provision** Rohit Chandra, Katayoun Rahbar and Peng Peng
94	**Two-Stage Optimization Framework for Battery Energy Storage System Co-Optimization in Regulation Market** Sajitha K. Nair, Katayoun Rahbar and Peng Peng

Oral Session OS 13 (3 Nov 2022, 5 pm - 6 pm)

Topic: Grid-edge systems and technologies (Part 2)

Venue: Melati 4002

Chair: Dr. Jimmy Peng

Paper ID	Title and authors
41	**Mobile Vehicle to Microgrid for Emergency Distribution System Operation Considering EV SOCs** Yuki Sato, Taisuke Masuta and Thavatchai Tayjasanant

78	**Distribution Network Congestion Management with Internet Data Centers Using Bi-level Programming** Zhihao Yang, Anupam Trivedi, Dipti Srinivasan, Ming Ni and Haoming Liu
191	**Investigating Demand-Side Management (DSM) Opportunities Using Load Profiling: The Case of Qatar** Haya Monawwar, Khaled Abedrabboh, Omar Almarri and Luluwah Al-Fagih
195	**Optimal sizing of Battery Energy Storage Systems for self-consumption in Urban Micro-grids** Rudy Tjandra, Lalitha Subramanian, Muhammed Imran, Erine Siew Pheng Teh, Romain Migne, Tobias Massier and Yan Xu

Technical Programme Schedule for 4 Nov 2022 (Friday)

Keynote 6

Time: 9 am - 9:45 am	Keynote: “Electric Spring and Smart Load: Technology, System-level Impact and Opportunities” by Prof. Ron Hui Venue: Plenary room

Keynote 7

Time: 9:45 am - 10:30 am	Keynote: “Electric Power and Propulsion” by Dr. Amit Gupta Venue: Plenary room

Panel Session 5

Time: 11 am - 12 pm	Industry Panel: “Urban Microgrids” by PRIMO Consortium Venue: Plenary room

Oral Session OS 14 (4 Nov 2022, 12:00 pm - 1:00 pm)

Topic: Grid-edge systems and technologies (Part 3)

Venue: Melati 4101AB

Chair: Dr. Elsa Feng

Paper ID	Title and authors
28	**Coordinated Operation Scheduling Method of Distribution Grid and Microgrids with Gradient Estimation by Finite Difference** Tetsushi Ono, Tsutomu Kawamura, Kenichiro Yamane and Lian-Zhu Shan
99	**Multi-Objective Volt/Var Control of Virtual Power Plant for Mitigating Voltage Unbalance** Qijun Liang, Cuo Zhang and Zhao Yang Dong
157	**PPO-based Pricing Method for Shared Energy Storage System**

	Xiangyu Li, Hangyue Liu, Chaojie Li, Guo Chen and Shiping Wen
163	**Integration of Demand Side Flexibility Resources in Distribution Network Planning with High Penetration of PV** Zhanyu Zhang, Junjie Hu and Huan Yan

Oral Session OS 15 (4 Nov 2022, 12:00 pm - 1:00 pm)

Topic: Uncertainty handling in modern power grids

Venue: Melati 4002

Chair: Dr. Anupam Trivedi

Paper ID	Title and authors
162	**Optimal Planning of Energy Storage Systems for PV Integration Considering Practical Needs of Decision Makers** Qite Tan, Hui Jiang and Xin Zhang

Oral Session OS 16 (4 Nov 2022, 2 pm - 3:30 pm)

Topic: Energy transition strategies, and environmental and climatic benefits of pushing forward net zero target

Venue: Melati 4101AB

Chair: Dr. Anupam Trivedi

Paper ID	Title and authors
54	**A Residential Community Level Load Management Scheme under Semi-Regulated Distribution Environment** Shitikantha Dash, Ranjana Sodhi and Balwinder Sodhi
186	**Trading Strategy for Renewable Energy Sources in Day-Ahead and Continuous Intraday Market** Yogesh Kumar Bichpuriya, Nidhisha Mahilong, Venkatesh Sarangan, Ashutosh Prajapati and Narayanan Rajagopal

Oral Session OS 17 (4 Nov 2022, 2 pm - 3:30 pm)

Topic: Power electronic converters in power grids

Venue: Melati 4102

Chair: Dr. Elsa Feng

Paper ID	Title and authors
178	**Power Balancing with Zero Sequence Voltage Injection Method for Cascaded H-Bridge Inverter Fed Grid-Connected PV System** Jitendra Tanguturi, Satendra Kumar and Siva kumar Keerthipati
190	**Analysis of Three-Level Bidirectional DC/DC Converters for Interfacing Ultracapacitors** Sindhu Geetla, Naresh Palla and Seshadri Sravan Kumar Vanjari
201	**Model Predictive Voltage and Current Control of Four Leg Inverter for Micro-grids and Distributed Generation Applications** Sivakumar Gannamraju and Ravikumar Bhimasingu
204	**Impact of non-idealities on Control of Ultracapacitor based Energy Storage Systems** Naresh Palla, Sai Vinay Kishore N and Seshadri Sravan Kumar Vanjari

Oral Session OS 18 (4 Nov 2022, 2 pm - 3:30 pm)

Topic: Coordinated operation of active distribution networks

Venue: Melati 4002

Chair: Dr. Wei Lin

Paper ID	Title and authors
91	**An AC-Feasible Linear Model in Distribution Networks with Energy Storage** Wei Lin

242	**Research on Optimal Configuration of Battery Energy Storage System for Photovoltaic Systems with Different Load Demand** Xiaolin Chen, Wenjin Zheng, Xiaochen Xu, Jing Zhang, Yu Bai and Yuekai Pan

Panel Session 6

Time: 4 pm - 6 pm	Industry panel: SPECS Consortium Venue: Melati 4101AB

Oral Session OS 19 (4 Nov 2022, 4 pm - 6 pm)

Topic: Electricity market, innovative business mechanism, policy/regulatory aspects (Part 2)

Venue: Melati 4102

Chair: Dr. Jaydeep Saha

Paper ID	Title and authors
53	**Transformation of Existing Commercial Building Cluster Towards Renewable Rich Microgrid: A Case Study for Marina Bay Sands Singapore** Jaydeep Saha, Samuel Lam Wei Liang, Nicholas Foo Cher Jun, Justin Tan Wee How, Ann Lee and Sanjib Kumar Panda
81	**Cost of Charging Electric Vehicles in a City** Wenhao Gao and Huixin Li
187	**Suitability Assessment of Flywheel Energy Storage Systems for providing new Frequency Response Services in the UK** Andrew J. Hutchinson and Daniel T. Gladwin

Technical Programme Schedule for 5 Nov 2022 (Saturday)

Technical Tour

Time: 9 am - 2 pm	Technical tours Venues: Rolls-Royce@NTU Corporate Lab and SP Group–NTU Joint Lab

Note: Transportation will depart from the MBS conference venue at 9 am, and return back to the MBS conference venue at 2 pm. Lunch will be provided at the NTU campus.

Virtual Presentations

Virtual presentations will be made available in video format to all registrants from the start of the conference up to 30 days afterwards.

Questions or discussions arising from the virtual presentations can be directed to the respective authors by email.

Paper ID	Title and authors
24 (Best Paper Award Candidate)	**Interpretable Data-Driven Probabilistic Power System Load Margin Assessment with Uncertain Renewable Energy and Loads** Bendong Tan, Junbo Zhao, Weijia Liu and Nan Duan
30	**Stochastic Unit Commitment Model Considering the Impact of Carbon Emissions Trading** Xin Bai, Xinran He, Yuge Sun, Li Zhang, Suibin Zhang and Tao Ding
31	**Security Assessment of Power System with Stochastic Uncertainty Based on Steady-state Controllable Distance** Chenxi Hu, Jiazuo Hou and Yunhe Hou
33	**Moving Target Defense Oriented D-FACTS Deployment and Operation** Zhen Yu, Binger Ye, Jiazhou Wang, Yang Liu, Yinguo Yang, Qiuyu Lu, Yu Zhu, Shuangxi Wu and Yang Liu
35	**Potential impact of wind-based Synthetic Inertia on the Frequency Response of the Argentine-Uruguayan Interconnected Power Systems** Nicolas Yedrzejewski and Alvaro D. Giusto
42	**A Multi Grid Coordinated Resilience Enhancement Approach for Load Recovery under Extreme Fault** Xiaotong Zhang, Hongxu Huang, Chaoxian Lv, Ge Zhang and Rui Liang
43	**Locating Faulty Section in Tie-line Using Classification Based Methods** Viresh S. Patel, Aastha Kapoor, Ankush Sharma and Saikat Chakrabarti

44	**Risk-Averse Graph Learning for Real-time Power System Emergency Load Shedding** Jizhe Liu, Yuchen Zhang, Ke Meng, Yan Xu and Zhao Yang Dong
49	**Impacts of Residential Ice Storage Systems on Low Voltage Networks** Javad Jazaeri, Tansu Alpcan and Robert Gordon
52	**A Bilevel Electricity Market Equilibrium Model Considering GENCO's Optimal Investment and Bidding Decision** Binghao He, Huanxin Liao, Wenxuan Liu and Junhua Zhao
57	**Real Time Detection and Control of Loss of Synchronism using Energy Function Criterion and Phase Sequence Exchange Technique** Nitesh Singh, Saikat Chakrabarti and Ankush Sharma
60	**Robust Data-driven Sparse Estimation of Power Flow Sensitivities for Smart Grid Monitoring and Operation** Yingqi Liang, Junbo Zhao, Dhivya Sampath Kumar, Pierluigi Siano and Dipti Srinivasan
62	**A Unified Distributed Secondary Controller using a Dynamic Consensus Algorithm in DC Microgrids** Dawei Liao, Fei Gao and Xin Liu
64	**Smart Charging of Electric Vehicles at Residence Under Different Tariff Regimes and Meter Configurations** Keerthi Balaram Javvadhi and Pradeep Yemula
66	**Voltage Stability Enhancement Through Active Power Control of Converter-Interfaced Generation** Weilin Zhong, Georgios Tzounas and Federico Milano
67	**Price Chain Analysis From Primary Energy Prices To Electricity Market Clearing Prices** Li Junjie, Wang Hongliang, Luo Yufeng, Hai Zheng, Lan Zhou, Hu Jiahua and Wang Yizheng
70	**Optimal Power Sharing Control with Stability Enhancement for Islanded Microgrids** Li Sun and Guangzhong Dong

71	**Streaming-Data-Driven Distributionally Robust Joint Operation of Multi-Microgrids and Off-Site Hydrogen Refueling Stations under Uncertainties** Longyan Li, Chao Ning and Haifeng Qiu
77	**Trajectory Based Model Predictive Control Strategy for LC Filtered VSIs** Jiahao Yu, Fei Gao and Junzhong Xu
79	**Distributed Hierarchical Control for VSC-Based DC Microgrids with AC-DC Coupled Strategy** Boshen Zhang, Fei Gao, Yuanlong Li and Dong Liu
82	**Comparing Spatio-Temporal Models for Aggregate PV Power Nowcasting** Guoping Ruan, Xiaoyang Chen, Yang Du, Eng Gee Lim, Lurui Fang and Ke Yan
83	**Optimal Strategy for Customer Directrix Load based Demand Response Considering Comfort and Preference of Customers** Yan Meng, Shaolun Xu, Juhua Hong, Shuai Fan, Jucheng Xiao and Guangyu He
90	**Exploring Peer-to-Peer Demand Response Transaction Framework between Prosumers in Electricity Retail Market** Min Lu, Kang Xie, Yicheng Jiang, Lizhong Xu, Kan Yang and Xunhu Yin
96	**A Gramian Angular Field Transform-Based Higher-Dimension Data-Driven Method for Post-Fault Short-Term Voltage Stability Assessment** Yuchi Tang, Chao Ren, Rui Zhang and Shuo Ren
98	**The Effect of Battery Storage Participation in Australian Wholesale Electricity and Frequency Control Markets** Yi Huang, Dan Gordon and Paul Scott
104	**Autonomous Decentralized Control of Distributed Generation using Multi-Agent Reinforcement Learning** Jian Liu, Weifeng Xu, Zhijun Liu, Guanhua Fu, Yunpeng Jiang and Ergang Zhao
111	**Economic Dispatch-Based Secondary Control for Islanded Microgrid** Fahad S. Alshammari and Ayman EL-Refaie

113	**Distance Protection with Dynamic Trip Region for Lines Terminated by Inverter Based Resources** Yuhao Xie, Yu Liu, Dian Lu, Binglin Wang, Yun'an Xu and Yixiong Jia
114	**General Format of Phase-Mode Transformation Matrices for 3 Phase Power Systems and Applications to Transmission Line Protection** Jinhao Qiu, Yu Liu, Dian Lu, Yuan Nie and Ze Liu
115	**Power Network Parameter Estimation with Voltage and Current Magnitude Measurements** Yixiong Jia, Yu Liu, Kang Yue, Xinguo Zhang, Yun'an Xu and Yuhao Xie
116	**Phasor Domain Single-Ended Transmission Line Fault Location Method Based on Harmonics without Remote Side Information** Ze Liu, Yu Liu, Dian Lu, Mengzhao Duan and Jinhao Qiu
119	**Optimal Two-Level Charging Station Pricing Considering Electric Vehicle User Price Elasticity** Xun Li, Chikun Huang, Han Wang and Youwei Jia
121	**A Bid Limit-based P2P Energy Trading Framework** Jainendra Jain, Sachinkumar Suthar and Naran M. Pindoriya
127	**Control Configuration Based on AOE and Its Application in the Power Allocation of BESSs** Shufeng Dong, Yibo Hua, Kunjie Tang and Chengsi Xu
122	**Performance Analysis of Adaptive AC/DC-Coupled Droop Characteristic in DC Microgrids** Chunxiaolu Yang, Boshen Zhang, Fei Gao, Dawei Liao and Jiahao Yu
130	**A Review of Control Strategies for Operation of Distributed Resources Under Grid Faults** Amit Gupta and Chandrasekhar Perumalla
132	**Day-Ahead Scheduling of Behind-the-Meter Battery Energy Storage Systems to Serve Utility Infrastructure** Joymala Moirangthem and Krishnanand Kaippilly Radhakrishnan
133	**Optimal Coordination of Electric Vehicles for Voltage Support in Distribution Networks** Xiaoli Chen and Alessandra Parisio

135	**Demonstration of Islanding and Grid Reconnection capability of a microgrid within distribution system** Niroj Gurung, Aleksandar Vukojevic and Honghao Zheng
138	**Impact of Solar Generation Unit on the Static Stability of Power Systems** Ruslan Ufa, Vladimir Rudnik and Fujin Deng
143	**False Data Injection Attack Detection with Feedforward Neural Network in Electric Vehicle Aggregator Bidding Price** Poornachandratejasvi L. Bhattar, Naran M. Pindoriya, Anurag Sharma and Naayagi Ramasamy T
144	**Congestion Management In Interconnected Microgrids For P2P Energy Trading Integrated with ESS** Ajitha S, Yazhini S, Sridharan Priyadharsen, Narayanan K, Anurag Sharma and Gulshan Sharma
145	**A Framework For Price Determination For P2P Energy Trading** Yazhini S, Sridharan Priyadharsen, Ajitha S, Narayanan K, Anurag Sharma and Tomonobu Senjyu
147	**Power loss reduction in distribution systems in the presence of DGs and EVs** Kartik Iyer, Mounikaa J, Misha Jha, Narayanan K, Gulshan Sharma, Anurag Sharma and Tomonobu Senjyu
148	**Power Optimization in DC Micro-grid with Monetary Perspective** Ashish Laddha, Vijayakumar Krishnasamy, Nandha Kumar Kandasamy and Satyanarayana Neeli
154	**Distributed Energy Control System Based on Blockchain and 5G** Yong Yan, Zhongxu Li, Jianping Huang and Hao Chen
155	**Energy management in low-voltage power systems: Benefiting from network-side flexibility** Yue Song
156	**National Carbon Market Supply Demand Balance Analysis Based on Unit Level Heterogeneous Characteristic Modeling** Yening Lai, Yifei Zhang, Jie Huang and Xuetong Chen

159	**Evolution of Electricity Distribution Control Room Data Streams – UK Case Study** Euan A. Morris, Rory Telford, Calum Mackinnon and Kyle Jennett
167	**Improved Reserve Option Design Method for Renewable Energy Generators** Kun Hou, Li Zhang and Xinyan Su
169 (Best Paper Award Candidate)	**Techno-Economic Comparison of Trading Agents for Renewable Energy Communities** Franz Teske, Felix Funk, Adrian Fehrle and Jörg Franke
171	**Economic Scheduling of Multi Microgrid System Considering Power Grid Expansion Costs** Franz Teske, Adrian Fehrle, Felix Funk and Jörg Franke
177	**Incentive models for electricity customers to participate in a cloud-based energy management system to generate flexibilities** Adrian Fehrle, Franz Teske and Jörg Franke
180	**Hierarchical AGC Dispatch with Aggregated Resources** Mingxu Xiang
184	**Flexibility in active distribution networks – modelling a fully coupled multi-energy system in MESMO** Verena Kleinschmidt, Thomas Hamacher and Vedran Peric
196	**A Novel Three-Phase Multilevel Inverter Cascaded by Three-Phase Two-Level Inverter and Two Single-Phase Boosted H-Bridge Inverters.** Niraj Kishore, Kapil Shukla and Nitin Gupta
198	**A Concept Solution Architecture for Electrical Distribution Control Centres** Calum J. Mackinnon, Matthew Hamilton, Kyle Jennett, Euan A. Morris and Rory Telford
199	**A Theoretical Loss Estimation Method for Distribution Network Based on Typical Equivalent Load Distribution Curve** Yuxi Wang, Xuekai Zhang, Li Zhang, Yijing Ren, Xinyan Su and Chenhao Ying
205	**Demand Analysis and Practice of Zero-carbon Industrial Parks** Wei Chen, Yang Su, Shi Song and Xiao Chen

207	**A Simplified Matching Algorithm of the Carbon Neutrality Path for the Industry Zones** Jingqi Jin, Nan Li, Yening Lai, Jie Huang and Xuetong Chen
208	**Optimal Operation of Green-Port Logistics System for Consumption Enhancement of Off-Shore Wind Power** Zichuan Shi, Feilong Fan, Jinming Yu, Guohao Yin, Hai Zhang and Zi Su
230	**Optimal Charging Site Recommendation and Scheduling for Electric Vehicles Considering User Price Sensitivity** Chikun Huang, Mengge Shi, Han Wang and Youwei Jia
210	**Stochastic Scheduling of Mobile Energy Storage Systems for Transmission System Resilience Enhancement** Zhanglei Guan, Haoyuan Yan and Tianyang Zhao
212	**A Multi-Agent Deep Reinforcement Learning based Voltage Control on Power Distribution Networks** Bin Zhang, Amer M. Y. M. Ghias and Zhe Chen
216	**Blockchain Application in Methodology for CCER** Zhigang Luo and Kehan Liao
217	**Energy-economic-environmental Feasibility of Building-integrated Photovoltaic Systems in Singapore** Yingqi Liang, Can Berk Saner, Tong Jun Kenneth Koh, Hao Dou, Zhaoqi Huang, Faika Andreas Wolfram and Jinxin Tan
221	**Charging Navigation for Commercial Electric Vehicles in Considering Traffic and Queuing Dynamics** Yantao Sun, Qilin Huang, Mengge Shi and Youwei Jia
223	**Study on the Financial Settlement of Textile Printing and Dyeing Enterprises in the Carbon Trading Environment** Ruixin Xie, Shuyun Ren, Sirui Xiao and Na Liu
224	**Charging Right Transaction Mechanism Among Green Charging Stations based on Blockchain Techniques** Yujie Liu, Mengge Shi, Youwei Jia and Linni Jian

227	**Suggestions on improving the carbon spot market and developing China's carbon futures market** Hao Pan, Zhibin Chen and Zixin Wang
228	**Sustainable Energy-based Cryptocurrency Mining** Yingqi Liang, Can Berk Saner, Bryan Min Kwang Lim, Kai Tseng Hong, Jeffrey Wei Chong Lim, Keeve Juin Hwee Ho, Li Zheng Lim and Yun Ying Loh
229	**Techno-economic Analysis and Strategy of Electric Vehicle Charging Station Deployment in Singapore** Yingqi Liang, Can Berk Saner, Xin He, Wei Wen Toh, Yingxuan Wang, Hao Zhou and Yiran Zhu
231	**Analysis on Motivation of Textile Printing and Dyeing Enterprises to Participate in Carbon Trading in China** Caimei Gao, Shuyun Ren, Xinxin Huang and Shiting Huang
232	**Review on China's National Carbon Market and Analysis for Commercial Development Potential of Carbon Capture, Utilization and Storage in China** Ivan Li, Haoming Zhu and Liping Zhang
234	**Techno-economic-environmental Analysis of Electric Vehicle Charging Facility Deployment in Singapore** Yingqi Liang, Can Berk Saner, Yuan Hao Kenny Kok, Kai Wen Kelly Chang, Yao Rong Lim, Jun Qing Lee and Qian He