IEEE CPE-POWERENG 2022

16th International Conference on Compatibility, Power Electronics and Power Engineering

29 Jun-1 July 2022 - Birmingham, UK

IEEE CPE-POWERENG 2022
BIRMINGHAM, UK

Technical programme

Wednesday 29.06.2022

08:00 – 08:45   Conference registration

08:45 – 09:00   Conference opening

09:00 – 10:00   Keynote Speech: Wind power as the backbone of the decarbonized energy systems
Nicolaos A. Cutululis, Department of Wind and Energy Systems, Technical University of Denmark

10:00 – 11:00   Session 1: Electric mobility and energy storage technology
Session Chair: Mattia Ricco (University of Bologna)

10:00 – 10:15   An MMC-based Fully Modular Ultra-Fast Charging Station Integrating a Battery Energy Storage System
E. Ferri, M. Barresi, L. Piegari (Politecnico di Milano)
10:15 – 10:30   Battery Energy Consumption Optimization for the EV Traction System
M. Elahi, M. Elsaadany, H. ur Rehman, S. Mukhopadhyay (American University of Sharjah)
10:30 – 10:45   Battery Cell Temperature Sensing Towards Smart Sodium-Ion Cells for Energy Storage Applications
T. Vincent, I. Hasa, B. Gulsoy, J. Sansom, J. Marco (University of Warwick)
10:45 – 11:00   Introduction of a Battery Performance Characteristic Map Based on the Internal Impedance on Cell and System Level
S. Pohlmann, A. Mashayekh, F. Schwitzgebel, M. Kuder, A. Gieraths, T. Weyh (University of the Bundeswehr Munich)

11:00 – 11:30   Coffee break and networking

11:30 – 12:45   Session 2: Future-proof power electronic systems and control for residential microgrids
Session Chair: Rosa Anna Mastromauro (University of Firenze)

11:30 – 11:45   Comparison of Full Power and Partial Power Buck-Boost DC-DC Converters for Residential Battery Energy Storage Applications
N. Hassanpour, A. Chub, A. Blinov, D. Vinnikov (Tallinn University of Technology)
11:45 – 12:00   An 8/6 SRM Drive with a Multilevel Converter Based on an NPC Structure and Designed to Provide Transistor Fault Tolerant Capability
V. Pires, D. Foito, A. Pires, A. Cordeiro, J. Martins (CTS/UNINOVA - ESTSetubal/IPS)
12:00 – 12:15   Aggregated Energy Flexibility Provision Using Residential Heat Pumps
F. Plaum, R. Ahmadi, A. Rosin (Tallinn University of Technology)

12:15 – 12:30	Info-Gap-Based Optimization of Microgrids Integrated with Power, Cooling and Hydrogen Generation Units
	F. Mahmoudnezhad, M. A. Mirzaei, F. Plaum, R. Ahmadi, J. Kilter, A. Rosin (Tallinn Univ. of Technology)
12:30 – 12:45	A Holistic D-PMU Optimal Placement Framework Considering Pragmatic Constraints in Smart Grids
	R. Ahmadi Ahangar (Tallinn University of Technology)

12:45 – 14:00   Lunch break

14:00 – 15:00   Session 3: Electrical machines and adjustable speed drives
Session Chair: Krzysztof Gorecki (Gdynia Maritime University)

14:00 – 14:15	Low-cost high-performance hybrid-PMsynRM for EV application
	C. Lee, F. Kucuk (Kyoto University of Advanced Science)
14:15 – 14:30	Influence of Delays on Digitally Controlled IM Drive with Inverter Output LC Filter
	N. Vaishnav, A. Kumar Jain (Indian Institute of Technology Delhi)
14:30 – 14:45	Optimization of a Flux Switching Permanent Magnet Machine Using Segmented Rotor with Multi-layer Flux Barriers
	S. Kazemisangdehi (Hadaf Institute of Higher Education)
14:45 – 15:00	Comparison Between Different High-Frequency Transformer for Resonant Power Converter
	L. P. Di Noia, R. Rizzo (University of Napoli Federico II)

15:00 – 15:15   Coffee break and networking

15:15 – 16:45   Session 4: Power generation, transmission and distribution
Session Chair: Shady Khalil (Texas A&M University at Qatar)

15:15 – 15:30	Fast Determination of the Short-Circuit Current Direction in Distributed Grids with Renewable Energy Sources
	N. Grebchenko (National University Life and Environmental Sciences of Ukraine)
15:30 – 15:45	Electrical interconnection network in an extreme dry weather scenario - the Portuguese case
	P. J. Santos, A. J. Pires, R. Castro (Polytechnic Institute of Setúbal)
15:45 – 16:00	Simplified Linear Load Flow Analysis for Transmission Networks
	V. Naga, M. Krishna, C. Perumalla (Indian institute of Technology Bhubaneswar)
16:00 – 16:15	Analysis of Thermo-Mechanical Aging on Medium Voltage XLPE Cable Insulation
	S. Khalil, A. Azimuddin (Texas AM University at Qatar)
16:15 – 16:30	Energy Management Strategy Designed for Offshore Oil Rig with Offshore Wind
	J. Z. Tee (University of Glasgow)
16:30 – 16:45	Adaptive Filtering for Energy Control of a Modular Multilevel Converter Operated as a Virtual Synchronous Machine Under Unbalanced Conditions
	E. Avdiaj, J. A. Suul, S. D'Arco, L. Piegari (Sintef Energy Research)

17:00 – 18:30   Welcome reception

Thursday 30.06.2022

08:30 – 09:00   Coffee break and networking

09:00 – 10:00   Keynote speech: Hydrogen and its role in railway decarbonisation
Stuart Hillmansen, School of Engineering, University of Birmingham

10:00 – 11:00   Session 5: Renewable energies
Session Chair: Marco Faifer (Politecnico di Milano)

10:00 – 10:15	Maximum power point tracking Algorithm Using ANFIS with Constant Power Generation Facility
	H. Omotoso, A. Al-Shammaa, H. Farh, A. Noman, A. Alkuhayli (King Saud University)
10:15 – 10:30	Reduced Power Model-Based Tracker for Photovoltaic Panels
	L. Cristaldi, M. Faifer, C. Laurano, R. Ottoboni, E. Petkovski, S. Toscani (Politecnico di Milano)
10:30 – 10:45	Grasshopper Optimization Algorithm for Optimal Sizing of a Stand-Alone Hybrid Energy System
	A. Alshammaa, H. M. H. Farh, A. A. Alkuhayli, A. Noman, A. M. Abdurraqeeb (King Saud University)

10:45 – 11:00   Parameter extraction of solar photovoltaic modules using Manta Ray Foraging Optimization (MRFO) algorithm
H. Omotoso, A. Alshammaa, H. Farh, A. Noman, A. Alkuhayli (King Saud University)

11:00 – 11:30   Coffee break and networking

11:30 – 12:45   Session 6: Power electronics and applications
Session Chair: Dmitri Vinnikov (Tallin University of Technology)

11:30 – 11:45   Validation of selected models of the magnetization curve of ferrite cores
K. Detka, K. Górecki (Gdynia Maritime University)
11:45 – 12:00   Improved Graph-Theory Based Modeling of the Smart Transformer for Hybrid Grids
J. Kuprat, J. Schaumburg, M. Langwasser, M. Liserre (Kiel University)
12:00 – 12:15   A Reconfigurable Multiport Converter for Grid Integrated Hybrid PV/EV/Battery System
O. Khan, B. Hredzak, J. Fletcher (UNSW)
12:15 – 12:30   Comparison between various types of electrical co-simulation applied to the power distribution system of a hybrid electric vehicle
V. Diaz, A. Barrado, C. M. Sanz, A. Lázaro (Universidad Carlos III de Madrid)
12:30 – 12:45   Optimal Design for Efficiency Improvement in Three Element Resonant Converters Based on their Load Dependent Properties
G. Ghosh, V. Nair, S. Vyapari (Indian Institute of Technology, Tirupati)

12:45 – 14:00   Lunch break

14:00 – 15:15   Session 7: Power electronics and applications
Session Chair: TBC

14:00 – 14:15   Approach for Predictive Time-Frequency Analysis Applied on Electric Drive System using Different PWM Techniques
R. Lateb, A. De Andrade, L. S. Haddad, J. Da Silva (SKF)
14:15 – 14:30   Near optimal PI Control of Cascaded Buck Converters in a DC Micro Grid
K. Iqbal, S. Ansari (University of Arkansas at Little Rock)
14:30 – 14:45   Analysis of Hybrid MLI Based Active Power Filter Topology for PV Grid-Tied Systems
A. Alkuhayli, A. Al-Shammaa, A. Noman, P. Asef (University of Hertfordshire)
14:45 – 15:00   Thermal limits of the maximum operating frequency of SiC MOSFETs
P. Górecki, K. Górecki (Gdynia Maritime University)
15:00 – 15:15   Performance Analysis of a Wind Turbine System with Adaptive Hysteresis Band Control
R. A. Mastromauro (University of Florence)

15:15 – 15:30   Coffee break and networking

15:30 – 17:00   Session 8: Smart grids technologies and applications
Session Chair: Paulo Santos (Instituto Politecnico de Setubal)

15:30 – 15:45   Methods for Improving Power and Bandwidth of Power Hardware-in-the-Loop Testbenches
E. García-Martínez, J. F. Sanz-Osorio, J. Muñoz-Cruzado-Alba, J. M. Perié (CIRCE)
15:45 – 16:00   Modelling Frameworks Applied in Smart Distribution Network Resiliency and Restoration
A. Alghamdi, D. Jayaweera (University of Birmingham)
16:00 – 16:15   Optimal PMU Placement Considering Data Integrity Attack
Z. Gao, J. Li (University of Birmingham)
16:15 – 16:30   Advanced Identification Methods for Power System Oscillations based on Measurements
S. Dai, X.-P. Zhang (University of Birmingham)
16:30 – 16:45   Renewable Energy Microgrid Cost Optimization using Simulated Annealing
A. Ignat-Balaci, D. Petreus, I. Ferencz (Technical University of Cluj-Napoca)
16:45 – 17:00   Three Phase Weighted Least Square Power System State Estimation Base on Fair Distribution Weighting Function method
H. A. Adamu, X.-P. Zhang (University of Birmingham)

19:00 – 22:00   Social dinner

Friday 01.07.2022

08:30 – 09:00 Coffee break and networking

09:00 – 10:45 Session 9: Transport electrification
Session Chair: Zhongbei Tian (University of Liverpool)

09:00 – 09:15 Small-Scale DC PETT Module Prototype for the Novel 25kV MVDC Electric Railway System
I. Ferencz, D. Petreuş, T. Pătărău (Technical University of Cluj-Napoca)

09:15 – 09:30 7 kW Converter Prototyping for EV Charging Network Development Supplied through Rail Traction Power Systems
M. Hajian, T. Mir, P. Tricoli (University of Birmingham)

09:30 – 09:45 Flexible and Modular Model for Smart Trolleybus Grids
R. Barbone, R. Mandrioli, M. Ricco, R. Paternost, F. Lo Franco, G. Grandi (University of Bologna)

09:45 – 10:00 Regenerative Braking for EVs Using PMSM with CHB as Bidirectional Traction Converter
F. N. Esfahani, A. Darwish (Lancaster University)

10:00 – 10:15 Comprehensive Study of a Hybrid Electric Ship for Optimum Onboard Fuel Consumption
S. Qazi, P. Venugopal, G. Rietveld (University of Twente)

10:15 – 10:30 State of Charge-Based Power Sharing Algorithm for Hydrogen and Battery Cells Supplying Double-Three Phase Permanent Magnet Synchronous Motor
N. Polater, T. Kamel, P. Tricoli (University of Birmingham)

10:30 – 10:45 Modelling of inductive wireless charging for electric vehicles
K. Jakubiak (Cardiff University)

10:45 – 11:15 Coffee break and networking

11:15 – 12:15 Session 10: Advances in high switching frequency power converters for e-mobility
Session Chair: TBC

11:15 – 11:30 A Configuration of 3-phase Traction Inverter Employing SiC Devices
F. Pellitteri, A. O. Di Tommaso, G. Vassallo, R. Miceli, R. Rizzo (University of Palermo)

11:30 – 11:45 DAB-Based Common-Mode Injection in Three-Phase Four-Wire Inverters
R. Mandrioli, T. Pereira, M. Ricco, M. Liserre, G. Grandi (University of Bologna)

11:45 – 12:00 DC Bias Abatement in Dual Active Bridge Converter using Covalent Active and Passive Components
D. Atkar, P. Chaturvedi, F. Pellitteri, P. Nachankar, S. Chaitanya (University of Palermo)

12:00 – 12:15 Multiphase Interleaved DC-DC Converter for Fast Charging Application of Electric Vehicles
C. Gupta, M. Das (Indian Institute of Technology Mandi)

12:15 – 13:15 Session 11: EMI and EMC issues and Energy Market
Session Chair: Armando Pires (Instituto Politecnico de Setubal)

12:15 – 12:30 Improvement of the estimation of electromagnetic pollution values in urban areas using genetic algorithms
R. Gallego, A. Rodríguez Gómez, F. J. Muñoz Gutiérrez (School vocacional training Ave María of Málaga)

12:30 – 12:45 EMC considerations of air-gapped PFC inductor for lighting equipment applications
W. Keung Mo, K. Paasch, T. Ebel (SDU)

12:45 – 13:30 Elicitation and Analysis of Requirements for a Peer-to-Peer Energy Market
M. Kilthau, V. Regener, A. Zeiselmair, J.-P. Beck (Helmut Schmidt Universität Hamburg)

13:00 – 13:15 Modeling a Blockchain-enabled Transactive Energy System for Community Microgrids
A. Boumaiza, M. Wanik Zamri, A. Sanfilippo (Hamad Bin Khalifa University)

13:15 – 13:30 Closing remarks

13:30 – 14:30 Lunch and end of conference

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T01 - Ying Xue, University of Birmingham, UK
T02 - Ebrahim Babaei, University of Tabriz, Iran
T03 - Andrii Chub, Tallinn University of Technology, Estonia
T04 - Rosa Mastromauro, University of Florence, Italy
T05 - Sheldon Williamson, University of Ontario, Canada
T06 - Peng Li, University of Aberdeen, UK
T07 - Obrad Dordevic, Liverpool John Moore University, UK
T08 - Zhongbei Tian, University of Liverpool, UK
T09 - Luigi Pio Di Noia, Università di Napoli Federico II, Italy
T10 - Marco Merlo, Politecnico di Milano, Italy
T11 - Nicola Pasquino, Università di Napoli Federico II, Italy

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