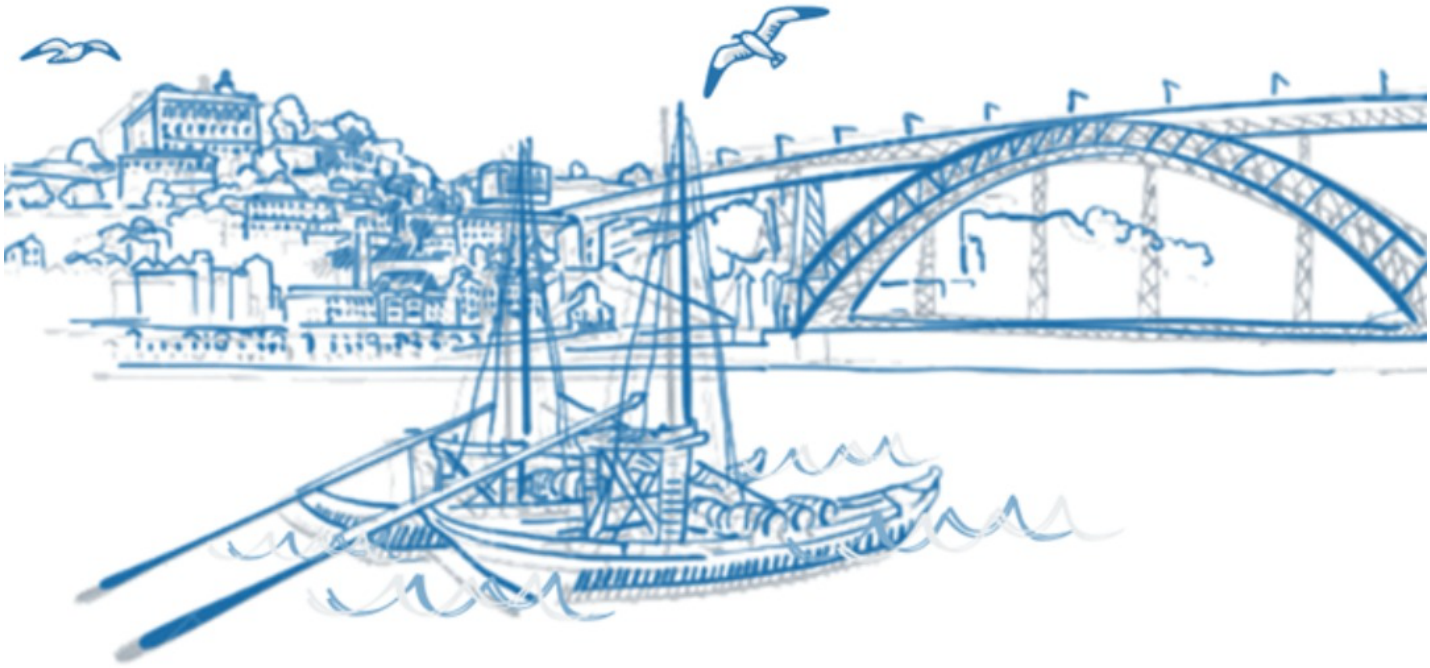
IEEE MELECON 2024

22nd IEEE Mediterranean Electrotechnical Conference

25 – 27 June 2024 ◆ Porto, Portugal



IEEE Region 8

IEEE PORTUGAL SECTION

Welcome Message form the General Chairs

On behalf of the IEEE Mediterranean Electrotechnical Conference (IEEE MELECON 2024) organizers, IEEE Portugal Section, and IEEE Region 8, we extend a warm welcome to the conference participants. This year's IEEE MELECON 2024, held in the beautiful city of Porto, Portugal, from June 25th to June 27th, features a rich and diverse program, reflecting the latest advancements and research in different fields of Electrical Engineering.

The program includes:

- **4 keynote speakers**, distinguished experts, providing valuable insights and perspectives
- **4 engaging tutorials** on cutting-edge topics
- **6 insightful workshops** exploring current industry trends and research breakthroughs
- **7 special events** organized by the IEEE Portugal Section and IEEE Region 8, offering unique opportunities for networking and collaboration
- **241 technical presentations** of peer-reviewed papers, distributed across **40 technical sessions**

No less important, an ambitious social program has been arranged. This includes a Welcome Reception on June 25th and the Gala Dinner on June 26th aboard a ship on the Douro River, providing a wonderful opportunity to enjoy the scenic beauty of Porto and connect with fellow attendees in a relaxed ambience.

We also extend our heartfelt appreciation to our patrons—INESCTEC, INOV, PLUX, and Glintt Global—whose generous support has been instrumental in making this conference possible.

Porto, with its rich cultural heritage and stunning scenery, serves as the perfect backdrop for our conference. We hope you take the opportunity to explore the city and enjoy its many attractions.

Thank you for joining us at IEEE MELECON 2024. We look forward to engaging discussions and valuable interactions throughout the conference.

Ana Madureira
Catarina Silva
Rodolfo Oliveira

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Zita Vale, *ISEP/P.PORTO*

TRACK 2 – Smart Industry and Manufacturing
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Ana Lopes, *University of Coimbra*
Octavian Postolache, *ISCTE-IUL*
Paulo Menezes, *University of Coimbra*

TRACK 3 – Future Healthcare
Anna M. Bianchi, *Politecnico di Milano*
João Paulo Cunha, *INESC TEC / University of Porto*
Paulo Carvalho, *University of Coimbra*

TRACK 4 – Digital Transformation
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João Ferreira, *ISCTE-IUL*
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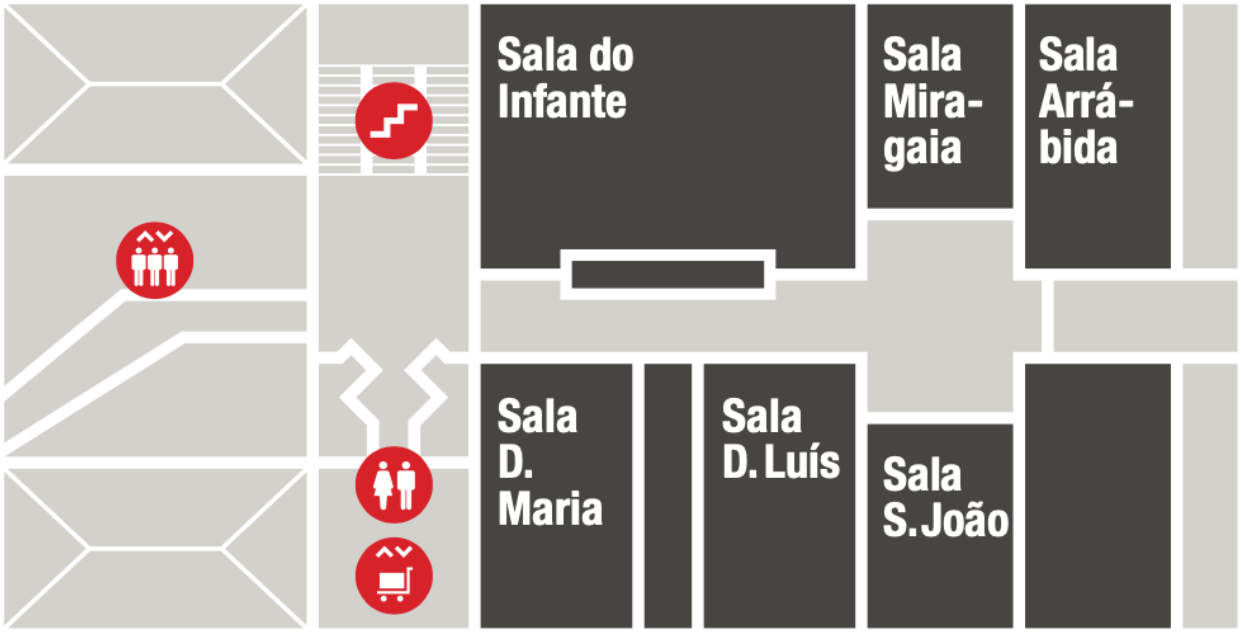
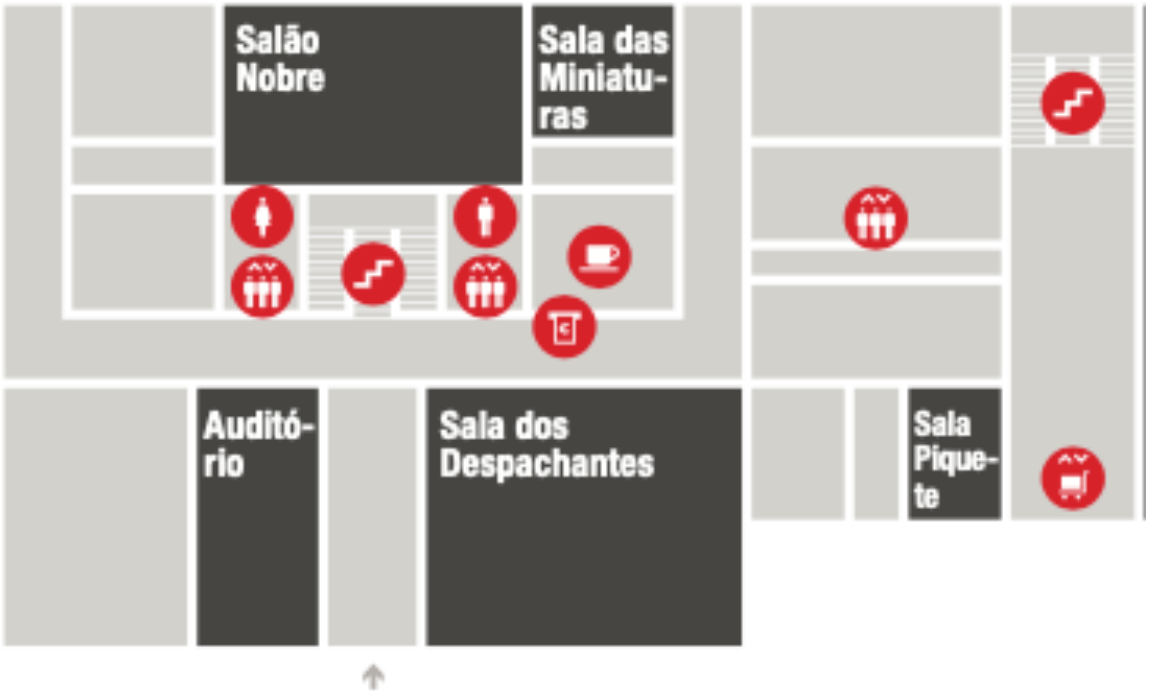
Conference Rooms

Second floor of *Alfandega do Porto* building (conference rooms)



Ground floor of "Alfandega do Porto" building (lunches and welcome reception take place in *Salão Nobre*)

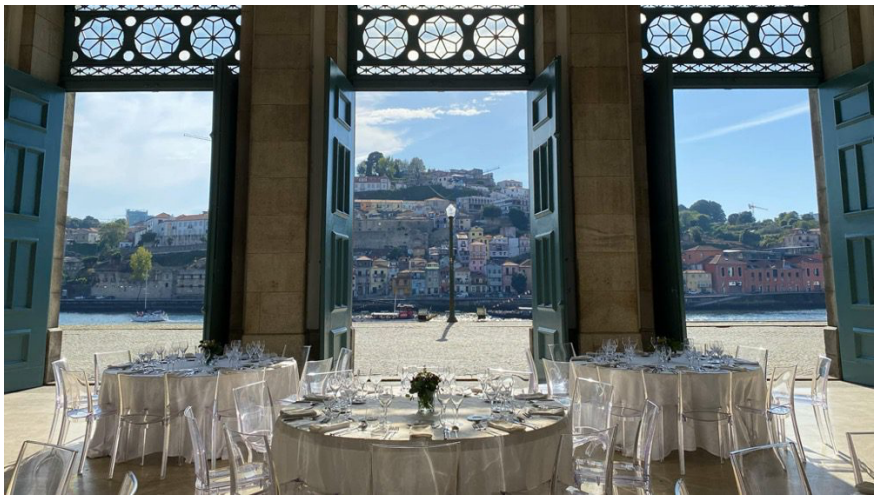


Alfândega do Porto Building Main Entrance

Social Events

WELCOME RECEPTION

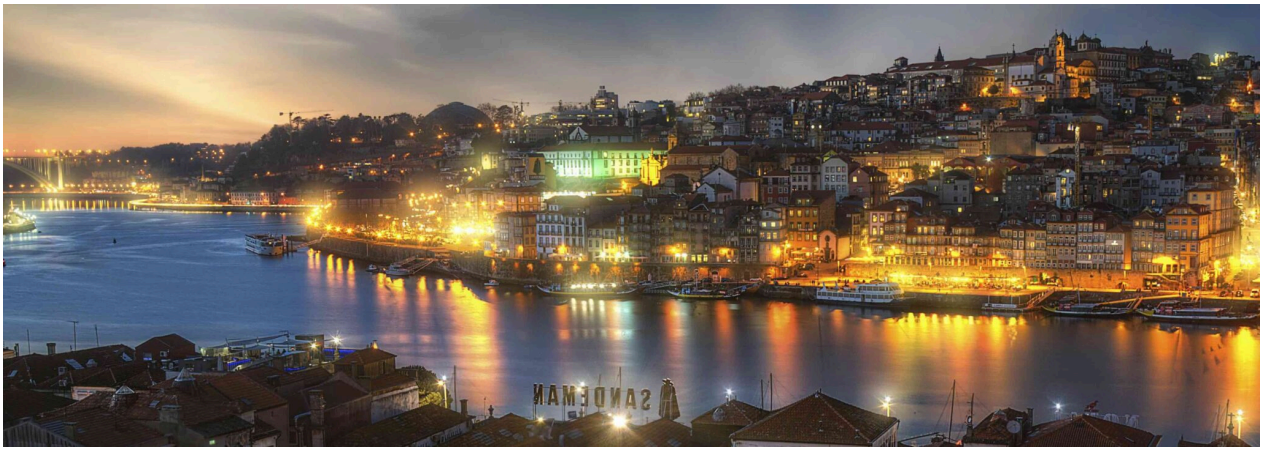
MELECON 2024 Welcome Reception will take place on June 25th *at* 6:30 pm *at* the Alfândega do Porto Noble Hall.



GALA DINNER

MELECON 2024 Gala Dinner will take place on *June 26th at 7:00 pm* aboard the Sea Star: River Cruise and Portuguese Culinary Delights

Join us at the gala dinner aboard the Sea Star, sailing the tranquil waters of the Douro River, for an unforgettable Gala Dinner experience. Delight in an exceptional dinner showcasing the finest of Portuguese cuisine.



Conference Program

Time	Room 1: D. Maria	Room 2: D. Luís	Room 3: S. João	Room 4: Miragaia	Room 5: Arrábida	

Tuesday, June 25

08:30-09:00	*Registration*					
09:00-10:30	**Tutorial 1**: *Modelling of High-Temperature Superconducting Bulks and Tapes for Electric Systems*	**Tutorial 2**: *Deep Learning-based Point Cloud Representation for Humans and Machines*	**Tutorial 3**: *Electrical Distribution System Resilience: State-of-the-art and Future Trends*	**Tutorial 4**: *Advantage of Winlink Global Radio Email® infrastructure and APRSTM positioning tool from Mediterranean coastal perspective*	**WS3**: *Exploring Blockchain Applications: A Comprehensive Overview of the Current Landscape*	**WS6**: *I-SEAMORE Community Program & Stakeholders Engagement*
10:30-11:00	*Coffee Break*					
11:00-12:30	**Tutorial 1**: *Modelling of High-Temperature Superconducting Bulks and Tapes for Electric Systems*	**Tutorial 2**: *Deep Learning-based Point Cloud Representation for Humans and Machines*	**Tutorial 3**: *Electrical Distribution System Resilience: State-of-the-art and Future Trends*	**Tutorial 4**: *Advantage of Winlink Global Radio Email® infrastructure and APRSTM positioning tool from Mediterranean coastal perspective*	**WS4**: *e-Hospital4Future - Building future through an innovated and digital skilled hospital*	
12:30-14:00	*Lunch*					
14:00-16:00	**WS1**: *What can You do with OutSystems?*	**IEEE1**: *IEEE R8 Student Paper Contest 2024*	**IEEE3**: *Workshop on IEEE conference leadership*	**IEEE5**: *Advancing Technology for Humanity in Action with IEEE Humanitarian Technologies Consortium*	**IEEE7**: *Women in Engineering*	
16:00-16:30	*Coffee Break*					
16:30-18:30	**WS2**: *Synergizing Phygital Marketing through Multimodal Artificial*	**IEEE2**: *Students*	**IEEE4**: *Young Professionals*	**IEEE6**: *Panel - From Lab Bench to Launch Pad!*	**WS5**: *High-Temperature Superconductivity*	

	Intelligence, Virtual Reality and Augmented Reality				*Technologies for a Sustainable Energy Transition*
18:30-20:00	*Opening Session & Welcome Reception*				

Wednesday, June 26

08:00-08:30	*Registration*					
08:30-09:30	**1W1**: *Sensors and Cyber Physical Systems*	**1W2**: *Industry 4.0*				
09:30-10:30	**Keynote 1**: *Evolving Approaches to Avionics: Design Challenges with Cyber Physical Systems by Kathleen Kramer, University of San Diego, United States*	**Keynote 2**: *Industry 4.0 and the Data Revolution by Francisco Almada Lobo, Critical Manufacturing, Portugal*	**1W3**: *Renewable Energy Systems I*	**1W4**: *Artificial Intelligence in Energy Systems*	**1W5**: *Signal Processing*	
10:30-11:00	*Coffee Break*					
11:00-12:30	**2W1**: *Special Session: New Perspectives in Diagnosis and Control of Electrical Power Systems and Converters Based on Artificial Intelligence*	**2W2**: *Special Session: Intelligent Management of Electrical Power Systems*	**2W3**: *Special Session: Empowering Healthcare: Patient-Centric Innovation and Technology Integration*	**2W4**: *Special Session: Machine Learning in the Future of Healthcare*	**2W5**: *Special Session: Advancements in Radar-Based Human Monitoring*	
12:30-14:00	*Lunch*					
14:00-16:00	**3W1**: *Energy Storage*	**3W2**: *Renewable Energy Systems II*	**3W3**: *Artificial Intelligence & Machine Learning in Health*	**3W4**: *Communications Systems*	**3W5**: *Power Electronics*	
16:00-16:30	*Coffee Break*					
16:30-18:00	**4W1**: *Special Session: Enabling Electric Mobility for Sustainable Grids, Cities and Society*	**4W2**: *Energy Management I*	**4W3**: *E-Health I*	**4W4**: *Smart Industry and Manufacturing*	**4W5**: *Smart Mobility and Transportation*	
19:00-23:30	*Gala Dinner*					

Thursday, June 27

08:00-08:30	*Registration*					
08:30-09:30	**1T1**: *Personalised Medicine*	**1T2**: *Energy Storage*	**1T3**: *Communications Networks*	**1T4**: *Sensors and Electronics*	**1T5**: *Sensing and Communications*	
09:30-10:30	**Keynote 3**: *Digital Biomarkers for Precision Medicine Interventions by Paolo Bonato, Harvard Medical School, United States*	**Keynote 4**: *Battery Storage - Hopes and Limits by Vladimiro Miranda, University of Porto, Portugal*				
10:30-11:00	*Coffee Break*					
11:00-12:30	**2T1**: *Special Session: Demand response techniques in Renewable Energy Communities (RECs) and smart grids: modelling and applications in a highly EV mobility penetrated scenarios*	**2T2**: *Special Session: Advanced Energy and Power Technologies for Future Power and E-mobility Systems*	**2T3**: *Special Session: Sustainable and Smart: Future Trend*	**2T4**: *Special Session: Advances in the internet of medical things*	**2T5**: *Special Session: Utility Scale and Distributed Storage for Sustainable and Efficient Power and Energy Systems*	
12:30-14:00	*Lunch*					
14:00-16:00	**3T1**: *Telemedicine and E-health*	**3T2**: *Digital Transformation I*	**3T3**: *Conversion and Control of Sustainable Energy Sources*	**3T4**: *E-Health II*	**3T5**: *Electrical Machines and Drives*	
16:00-16:30	*Coffee Break*					
16:30-18:00	**4T1**: *Cybersecurity*	**4T2**: *Energy Management II*	**4T3**: *Digital Transformation II*	**4T4**: *Power, Energy, and Power Electronics*	**4T5**: *Learning and Control in Energy Systems*	

18:00-18:30	*Closing Session*

Tuesday, June 25

Tuesday, June 25 9:00 - 10:30

WS6: I-SEAMORE Community Program & Stakeholders Engagement

Workshop program details: https://2024.ieee-melecon.org/workshop

Tuesday, June 25 9:00 - 10:30

Tutorial 1: Modelling of High-Temperature Superconducting Bulks and Tapes for Electric Systems

João Fernandes (Instituto Superior Técnico, University of Lisbon, Portugal), Francisco Silva (IDMEC/ LAETA, Portugal)

Room 1: D. Maria

This tutorial will provide key insights into superconducting technology (bulks and tapes) for electric power systems and methodological approaches to estimate their design and performance. First, technical challenges are presented and discussed, along with current developments on how to overcome them. Then, their physical phenomena are explained, from a macroscopic point of view, for DC and AC magnetic fields and currents. A methodology is provided to analyze their performance in simple and complex systems using Finite Element and analytical modelling. Finally, a case study is presented comparing a conventional synchronous machine to a superconducting one. Upon completion, the attendees will obtain an important overview of the potential and challenges of superconducting technology and tools to evaluate superconducting systems.

Tuesday, June 25 9:00 - 10:30

Tutorial 2: Deep Learning-based Point Cloud Representation for Humans and Machines

Fernando Pereira (Instituto Superior Técnico, Universidade de Lisboa, Instituto de Telecomunicações, Portugal), Nuno Rodrigues (Instituto Politécnico de Leiria, Instituto de Telecomunicações, Portugal)

Room 2: D. Luís

The demand for more immersive and interactive experiences has driven the use of new 3D multimedia formats, more fitted to virtual and augmented reality applications. Among these formats, point clouds (PCs) have gained relevance, due to their ability to represent the scenes' 3D visual information, using a set of points and associated attributes,

notably color. To offer realistic and immersive experiences, PCs need millions, or even billions, of points, thus asking for efficient representation and coding solutions, which are critical for the practical deployment of emerging applications and services.

This tutorial will focus on the DL-based point cloud representation state-of-the-art and emerging trends. The potential of the DL-based coding has been recognized by JPEG and MPEG which have started projects towards standardizing DL-based PC coding solutions. Among these, the JPEG Pleno project is leading the efforts for the development of a new PC coding standard. These initiatives clearly demonstrate that the multimedia coding landscape is facing a revolution with the emergence of DL-based technology, not only supported by gains in compression efficiency when compared with previous hand-crafted coding solutions, but also on its potential to offer an effective, common, unique representation for both human visualization and machine consumption. In this context, computer vision tasks will be performed in the latent/compressed domain with high accuracy and not after decoding, thus suffering from compression artifacts, as it happens nowadays. The compressed domain processing will not only allow to use features directly extracted from the PC originals but will also allow to save the complexity associated with the decoding process.

Considering the fast changing pace of the disruptive new approaches in the multimedia coding arena brought by the DL-based algorithms, this tutorial targets members of the multimedia signal processing community, providing a first person testimony of some of the most recent developments in DL-based PC representation and compressed domain processing techniques.

Tuesday, June 25 9:00 - 10:30

Tutorial 3: Electrical Distribution System Resilience: State-of-the-art and Future Trends

Andrea Mazza (Politecnico di Torino - Dipartimento Energia "Galileo Ferraris", Italy)

Room 3: S. João

In the last decades, the occurrence of extreme weather events (EWEs) increased and endangered both human lives and infrastructures. EWEs are usually classified as High-Impact/Low-Probability (HILP) events because they strongly affect the proper operation of the infrastructures, but their occurrence rate is not so high (yet). The electrical grid (and the distribution system in particular) is one of the infrastructures more under pressure, because i) it is extended and widespread in the territory, ii) most of its components are aged, and iii) its design was not based on events of such magnitude, because of their (past) low occurrence frequency. The impact of HILP phenomena on the electrical grid varies according to its resilience, i.e., its attitude to withstand extreme events and to absorb the stress due the hazard occurrence. But: how can be defined the resilience for the electrical system? How can we treat it? Which is the state-of-the-art about this topic? What about future trends? This tutorial aims to introduce the audience to the resilience topic, by focusing on real-world case studies involving the distribution system.

Tuesday, June 25 9:00 - 10:30

Tutorial 4: Advantage of Winlink Global Radio Email® infrastructure and APRSTM positioning tool from Mediterranean coastal perspective

Miroslav Skoric

Room 4: Miragaia

In this tutorial, the audience will learn how to configure and use recently developed hardware and software for participating in the amateur radio APRS (Amateur Packet/Position Reporting System); How to use APRS and Winlink to communicate with remote correspondents without Internet or telephone connections; How to use APRS and similar amateur radio services in a community to save lives and properties; How to contribute to weather observation (amateur radio meteorology) by participating in APRS; How to create a local AMUNET (AMateur radio University NETwork) and expand visibility of an educational institution.

Tuesday, June 25 9:00 - 10:30

WS3: Exploring Blockchain Applications: A Comprehensive Overview of the Current Landscape

Room 5: Arrábida

Workshop program details: https://2024.ieee-melecon.org/workshop

Tuesday, June 25 11:00 - 12:30

WS4: e-Hospital4Future - Building future through an innovated and digital skilled hospital

Room 5: Arrábida

Workshop program details: https://2024.ieee-melecon.org/workshop

Tuesday, June 25 14:00 - 16:00

WS1: What can You do with OutSystems?

Room 1: D. Maria

Workshop program details: https://2024.ieee-melecon.org/workshop

Tuesday, June 25 14:00 - 16:00

IEEE1: IEEE R8 Student Paper Contest 2024

Room 2: D. Luís

Chair: Vera Markovic (University of Nis, Serbia)

Detailed program: https://2024.ieee-melecon.org/special_events

14:00 ***Using Neural Networks in the Search of Low Auto-Correlation Binary Sequences***
Jan Popič (University of Maribor, Slovenia); Janez Brest (University of Maribor & FEECS, Slovenia); Borko Bošković (University of Maribor, Slovenia)

14:20 ***BEVSORT: Bird Eye View LiDAR Multi Object Tracking***
Loay Wael Alfeqy, Sr. and Hossam Munim (Ain Shams University, Egypt); Shady Ahmed Maged (AinShams University, Egypt); Diaa Emad Abdel Fattah Mohamed (Ain Shams University, Egypt)

14:40 ***Accelerating Convergence in Split Learning for Time-Varying and Resource-Limited Environments***
Matea Marinova (Ss. Cyril and Methodius University, Macedonia, the former Yugoslav Republic of); Valentin Rakovic (Ss. Cyril and Methodius University in Skopje, Macedonia, the former Yugoslav Republic of)

15:00 ***Smart Homes, Smarter Savings: Energy Trading With Deep Reinforcement Learning***
Matic Pokorn and Jernej Hribar (Jozef Stefan Institute, Slovenia)

15:20 ***Designing Pre-Training Datasets From Unlabeled Data for EEG Classification With Transformers***
Tim Bary (ICTEAM, Belgium); Benoit Macq (UCL, Belgium)

Tuesday, June 25 14:00 - 16:00

IEEE3: Workshop on IEEE conference leadership

Room 3: S. João

Detailed program: https://2024.ieee-melecon.org/special_events

Tuesday, June 25 14:00 - 16:00

IEEE5: Advancing Technology for Humanity in Action with IEEE Humanitarian Technologies Consortium

Room 4: Miragaia

Detailed program: https://2024.ieee-melecon.org/special_events

Tuesday, June 25 14:00 - 16:00

IEEE7: Women in Engineering

Room 5: Arrábida

Detailed program: https://2024.ieee-melecon.org/special_events

Tuesday, June 25 16:30 - 18:30

WS2: Synergizing Phygital Marketing through Multimodal Artificial Intelligence, Virtual Reality and Augmented Reality

Room 1: D. Maria

Workshop program details: https://2024.ieee-melecon.org/workshop

Tuesday, June 25 16:30 - 18:30

IEEE2: Students

Room 2: D. Luís

Detailed program: https://2024.ieee-melecon.org/special_events

Tuesday, June 25 16:30 - 18:30

IEEE4: Young Professionals

Room 3: S. João

Detailed program: https://2024.ieee-melecon.org/special_events

Tuesday, June 25 16:30 - 18:30

IEEE6: Panel - From Lab Bench to Launch Pad!

Room 4: Miragaia

Detailed program: https://2024.ieee-melecon.org/special_events

Tuesday, June 25 16:30 - 18:30

WS5: High-Temperature Superconductivity Technologies for a Sustainable Energy Transition

Room 5: Arrábida

Chairs: Wescley Tiago Batista de Sousa (Karlsruhe Institute of Technology, Germany), João Murta-Pina (Universidade Nova de Lisboa, Portugal)

Workshop program details: https://2024.ieee-melecon.org/workshop

16:30 ***Proposal: A Contactless Microwave Method to Assess the Critical Current of Superconducting Films***

Andrea Alimenti (Roma Tre University, Italy); Achille Angrisani Armenio, Andrea Augieri, Giuseppe Celentano and Valentina Pinto (ENEA, Italy); Nicola Pompeo (Università Roma Tre, Italy); Francesco Rizzo (ENEA, Italy); Kostiantyn Torokhtii, Pablo Vidal García and Enrico Silva (Università Roma Tre, Italy)

Wednesday, June 26

Wednesday, June 26 8:30 - 9:30

1W1: Sensors and Cyber Physical Systems

Room 1: D. Maria

Chair: Kurian Polachan (IIIT-Bangalore, India)

8:30 ***Development of E-Tattoo Sensors for Monitoring of Plants Hydration Level***

Lazar Milić, Milan Radovanovic, Mitar Simić and Saima Qureshi (University of Novi Sad, Serbia); Đina Micić (University of Novi Sad, Malaysia); Goran Stojanovic (University of Novi Sad, Serbia)

8:45 ***Microplastics Detection With Microfluidic Near-Field Microwave Sensors***

André Barrancos (Instituto Superior Técnico & Instituto de Telecomunicações, Portugal); Vasco Luz (Instituto Superior Técnico, Portugal); Luis Rosado (Instituto de Telecomunicações & Instituto Superior Técnico, Portugal)

9:00 ***ioPUF: A PUF-Based IoT Node Identification Utilizing Pull-Up/Down Resistors on IO Pins***

Pralay Chakrabarty (IIT Guwahati, India); Ananya Lakshmi Ravi (Indian Institute of Information Technology, Design and Manufacturing, Kancheepuram, India); Kurian Polachan (IIIT-Bangalore, India)

9:15 ***Electro-Pneumatic Interface Framework for PAM-Based Humanoid Robot Motion Control With EMG***

Nathan Hiruy (Luleå University of Technology, Sweden); Vidya Sumathy (Postdoc, Sweden); Jakub Haluska (Junior Research Eng., Sweden); George Nikolakopoulos (Lulea University of Technology, Sweden)

Wednesday, June 26 8:30 - 9:30

1W2: Industry 4.0

Room 2: D. Luís

Chair: Vincenzo Randazzo (Politecnico di Torino, Italy)

8:30 ***Design of PLC Based Device for Orientation Ferromagnetic Fibers in Cementitious Composite***

Miloš Mlejnek and Karel Künzel (CTU, Czech Republic); Kateřina Nováková and Petr Konvalinka (Czech Technical University in Prague, Czech Republic)

8:45 ***Per-Instance Algorithm Configuration for Production Planning in a Reconfigurable Assembly System***

Daniel Guzman Vargas (University of Ghent & Flanders Make, Belgium); Sidharta Gautama (Ghent University & Flanders Make, Belgium); Mehmet Uzunosmanoglu, Birger Raa and Veronique Limere (Ghent University, Belgium)

9:00 ***A Novel Testbed for Evaluating ROS 2 Robot Swarm Wireless Communications***

José-Borja Castillo-Sánchez (University of Málaga, Spain); Eva González-Parada and Jose Manuel Cano-Garcia (University of Malaga, Spain)

9:15 ***Generation of Synthetic Data for Deep Learning in Manufacturing Quality Control Systems***

Mohamed Slim Werda (SIGMA Clermont University, France); Hamza Taibi and Khalid Kouiss (University Mohammed VI Polytechnic, Morocco); Ahmed Chebak (Mohammed VI Polytechnic University (UM6P), Morocco)

Wednesday, June 26 8:30 - 10:30

1W3: Renewable Energy Systems I

Room 3: S. João

Chair: Bernardo Silva (University of Porto and INESC TEC Porto Portugal, Portugal)

8:30 ***Network Harmonic Impedance Measurement: Practical Challenges and Possible Solutions***

Fredrick M. Mwaniki (Stellenbosch University, South Africa)

8:45 ***Experimental Investigation and Modelling of the Temperature Effect in Mono-Si Solar Cells Using the Novel d1MxP Model***

Catarina P. Correia V. Bernardo (Instituto Superior Técnico, Portugal); Ricardo A. Marques Lameirinhas

(Instituto Superior Técnico & Instituto de Telecomunicações, Portugal); Sofia Martins (Instituto Superior Técnico, Portugal); João Paulo N. Torres (Instituto de Telecomunicações, Portugal); António Baptista (Instituto Superior Técnico, Portugal); Maria João Martins (Academia Militar, Portugal); Marcelino Santos (Instituto de Engenharia de Sistemas e Computadores - Investigação e Desenvolvime, Portugal)

9:00 ***Offshore Wind Farm Export System Design and Validation – Impact of Its Main Parameters***
Txus Bernal, Pablo Eguia, Jesus Mauricio Perez, Aitor Blazquez and Esther Torres (University of the Basque Country (UPV/EHU), Spain)

9:15 ***Offshore Wind Farm Black Start With Grid-Forming Control***
Prashanth Hebbal Prakash (University of Porto, Portugal); Joao Pecas Lopes (University of Porto & INESC Porto, Portugal); Bernardo Silva (University of Porto and INESC TEC Porto Portugal, Portugal)

9:30 ***A Two-Phase Approach for the Electrical Layout Optimization of the Offshore Wind Farms***
Rodrigo M Castro (FEUP & INESC TEC, Portugal); Bernardo Silva (University of Porto and INESC TEC Porto Portugal, Portugal); Ehsan Kazemi-Robati (INESC TEC, Portugal)

9:45 ***Scalable Emulator for Hydrogen-Based Gas Engines in Decentralized Combined Heat and Power Plants***
Johann Zitzelsberger (Westsächsische Hochschule Zwickau & Sys-O-Tec Innovation Consulting E. K., Germany); Uwe David (West Saxon University of Applied Sciences of Zwickau, Germany); Alina Andarbekova (Sys-O-Tec Innovation Consulting, European Union)

10:00 ***Cell Level Partial-Shading Condition Quantification and Simulation on PV Panels***
Miguel Tradacete-Ágreda, Carlos Santos-Pérez, Francisco Javier Rodríguez-Sánchez, Pedro Martín-Sánchez, Pablo José Hueros-Barrios and Enrique Santiso-Gómez (University of Alcalá, Spain)

10:15 ***Classification of Solar Panel Technology and Photovoltaic Cell Status Applying Machine Learning to Electroluminescence Images***
Joseph A. Prado, Carlos A. Paragua-Macuri, Dante A. Mendoza, Jan A. Töfflinger and José R. Angulo (Pontificia Universidad Católica del Perú, Peru)

Wednesday, June 26 8:30 - 10:30

1W4: Artificial Intelligence in Energy Systems

Room 4: Miragaia
Chair: Pedro Faria (Polytechnic Institute of Porto, Portugal)

8:30 ***Machine Learning Methods as Fast Heuristics for Network Topology Optimization***
Felix Preuschoff and Luna Zirkel (RWTH Aachen University, Germany); Albert Moser (IAEW, RWTH Aachen, Germany)

8:45 ***Machine Learning for Multi-Fault Classification in Park's Vector Trajectories of PMSMs***
Adam Zsuga (Széchenyi István University, Hungary); Adrienn Dineva (Óbuda University, Hungary)

9:00 ***Voltage Control Using Optimization-Based Method in a Digital Twin***
Thien Phong Tran and Tuan-Quoc Tran (CEA-INES, France); Minh Tri Le and Raphael Caire (University

Grenoble Alpes & Grenoble-INP, France)

9:15 ***Smart Solution for Energy Communities: Integrating Demand Response and Unsupervised Learning Evaluation Metrics***
Ruben Barreto (Polytechnic of Porto, Portugal); Luis Gomes (Polytechnic of Porto (GECAD), Portugal); Zita Vale (Polytechnic Institute of Porto, Portugal)

9:30 ***Neural Network Control of AC/DC Converters Robust to AC Grid Faults***
Davide Angrilli (University of L'Aquila, Italy); Federico Centi (University of L Aquila, Italy); Andrea Credo and Marco Tursini (University of L'Aquila, Italy)

9:45 ***A Novel Cascading Artificial Neural Networks for Enhanced Distribution Network State Estimation***
Mohamad EL Iaali, Reza Razi and Antoine Bruyere (Centrale Lille, France); Bruno François (Ecole Centrale de Lille & L2EP, France); João Soares (Polytechnic Institute of Porto & GECAD - Knowledge Engineering and Decision Support Research Center, Portugal)

10:00 ***Power Systems Modelling and Digital Twins for Real Time Simulations***
Manuela Minetti (University of Genoa, Italy); Andrea Bonfiglio (University of Genova, Italy); Matteo Fresia (University of Genoa, Italy); Ivone Benfatto and Ye Yulong (ITER Organization, France)

10:15 ***NTL Detection in Smart Grids by Means of a Reservoir Computing-Based Solution***
Adrià Serra Oliver, Sr. (Universitat de les Illes Balears & Sampol Ingenierias y Obras, Spain); Vincent Canals Guinand (Universitat de les Illes Balears, Spain); Pau Joan Cortes Forteza (Sampol, Spain); Alberto Ortiz Rodríguez (Universitat de les Illes Balears, Spain)

Wednesday, June 26 8:30 - 10:30

1W5: Signal Processing

Room 5: Arrábida
Chair: Mojtaba Mahdavi (Ericsson, Sweden)

8:30 ***Using Machine Learning to Investigate Potential Image Bias in News Articles***
Gabriel Hili and Dylan Seychell (University of Malta, Malta)

8:45 ***Complex-Domain FIR Filter Design for Signal Processing Applications***
Mojtaba Mahdavi (Ericsson, Sweden)

9:00 ***Novel Computational Kernels for Signal Processing and Digital Transformation***
Mojtaba Mahdavi (Ericsson, Sweden)

9:15 ***Online Signature Verification Using LightGBM for Chinese Signatures***
Mohammad Saleem (Budapest University of Technology and Economics, Hungary)

9:30 ***Memory Optimization for FPGA Implementation of Correlation-Based Beamforming***
Helder Avelar (INESC TEC and FEUP, Portugal); João C Ferreira (INESC TEC and Faculty of Engineering, University of Porto, Portugal)

9:45 ***A Methodology for Non Destructive Reconstruction of Multilayer PCBs Using Thermal Waves***
Enrico Spateri and Giambattista Gruosso (Politecnico di Milano, Italy)

10:00 ***Kalman Filter Aided Depth-Based Motion Saliency Detection in Human Activity Recognition Applications***
Alexander Gutev and Carl J. Debono (University of Malta, Malta)

Wednesday, June 26 9:30 - 10:30

Keynote 1: Evolving Approaches to Avionics: Design Challenges with Cyber Physical Systems by Kathleen Kramer, University of San Diego, United States

Room 1: D. Maria

Kathleen A. Kramer, PhD, is a professor of Electrical Engineering at the University of San Diego. She received her MS and PhD in Electrical Engineering from the California Institute of Technology, and her BS in Electrical Engineering (with a second major in Physics) magna cum laude from Loyola Marymount University. She has worked as a Member of Technical Staff doing research at several companies including ViaSat, Hewlett Packard and Bell Communications Research. Her teaching interests include signal processing, communications, and capstone design. Her recent course offerings include the electrical engineering senior design sequence, signals and systems, wireless communications, and communication principles.

Author or co-author of over 100 publications, her research interests are in the areas of multi-sensor data fusion, intelligent systems, neural and fuzzy systems. She has recent published journal articles in IEEE Transactions on Instrumentation and Measurement, the International Journal of Intelligent Systems, and the Journal of Robotics. The work she authored or co-authored in 2014 was presented at the 10th International Conference on Communications (Bucharest, Romania), the 2014 International Symposium on Communications, Control, and Signal Processing (Athens, Greece), the 2014 International Symposium on Innovations in Intelligent Systems and Applications (Alberobello, Italy) and the 23rd International Conference on Systems Engineering (Las Vegas, NV).

Kathleen A. Kramer currently is President-Elect of IEEE and serves as a member of the Engineering Accreditation Commission of ABET. A senior member of IEEE, she is a Past Chair of the IEEE San Diego section. She is a member of the Board of Governors of the IEEE Aerospace Electronic Systems Society and chairs the San Diego IEEE Aerospace Electronic Systems Society San Diego Chapter. She has been recognized by both IEEE and SWE for a variety of leadership activities and was nominated in 2014 for an ATHENA Pinnacle award. She supports San Diego outreach activities such as Expand Your Horizons, FIRST LEGO League and the FIRST Technical Challenge. She is currently chief advisor to the USD chapter of Tau Beta Pi (California Alpha Epsilon) and is a member of other honor societies including IEEE-Eta Kappa Nu, Sigma Pi Sigma, and Alpha Sigma Nu.

Wednesday, June 26 9:30 - 10:30

Keynote 2: Industry 4.0 and the Data Revolution by Francisco Almada Lobo, Critical Manufacturing, Portugal

Room 2: D. Luís

Francisco Almada Lobo is an Electrical and Computer Engineer from the Faculty of Engineering of the University of Porto (1996) and an MBA from Porto Business School (2004). He began his career at the Porto CIM Center as a Researcher, having joined Siemens Semicondutores in 1997. From 1997 to 2009 he held various positions at Siemens, Infineon, and Qimonda, being manager of the Porto Development Center, responsible for factory digitalization projects in the different units of the group. He is co-founder of Critical Manufacturing (2009), having been CEO of the company since 2010. He is also an advisor to several technology startups and advisory board member at Critical Ventures, founding member of Core Angels Porto, member of the executive committee of SEMI Smart Manufacturing Technology Europe and the Forbes Technology Council.

Wednesday, June 26 11:00 - 12:30

2W1: Special Session: New Perspectives in Diagnosis and Control of Electrical Power Systems and Converters Based on Artificial Intelligence

Room 1: D. Maria

Chair: Marco Bindi (University of Florence, Italy)

11:00 ***Failure Prevention Based on Principal Component Analysis and Machine Learning for Wireless Power Transfer Systems***

Matteo Intravaia, Gabriele Lozito, Lorenzo Becchi, Fabio Corti, Antonio Luchetta and Alberto Reatti (University of Florence, Italy)

11:15 ***Theoretical Approach for Fault Prognosis in Electrical Power Transformers Using High Frequency Signals and Artificial Intelligence Techniques***

Marco Bindi (University of Florence, Italy); Igor Aizenberg (Manhattan College, USA); Antonio Luchetta, Matteo Intravaia, Maria Cristina Piccirilli and Carlo Carobbi (University of Florence, Italy)

11:30 ***Artificial Hummingbird Algorithm for Optimal Reconfiguration of Electrical Distribution Networks***

Younes Zahraoui (Tallinn University of Technology, Estonia); Anes Bouhanik (University of Biskra, Algeria); Tarmo Korõtko (Tallinn University of Technology, Estonia); Argo Rosin (FinEst Centre for Smart Cities Tallinn University of Technology, Estonia); Saad Mekhilef (Swinburne University of Technology, Australia)

11:45 ***New Perspectives in Artificial Intelligence-Based Object Detection for Wireless Power Transfer Systems***

Fabio Corti, Matteo Intravaia, Gabriele Lozito and Alberto Reatti (University of Florence, Italy); Eliseo Villagrasa (Universidad de Málaga, Spain); Alicia Triviño (University of Malaga, Spain)

12:00 ***Neural Network Approaches for State of Charge Prediction of Rechargeable Lithium Polymer Batteries***

Ludovica Apa (Sapienza, University of Rome, Italy); Zaccaria Del Prete (SAPIENZA University of Rome, Italy); Flavia Forconi (University of Roma Tre, Italy); Martina Palermo (Roma Tre University, Italy); Francesco Riganti Fulginei (Roma TRE University, Italy); Emanuele Rizzuto (Sapienza University of Rome, Italy); Lorenzo Sabino (Università Degli Studi Roma Tre, Italy)

12:15 ***Autonomous Hybrid Forecast Framework to Predict Electricity Demand***
Christoph Gehbauer (Energy Technologies Area Lawrence Berkeley National Lab Berkeley, USA); Paulo Moura Oliveira (University of Trás-Os-Montes and Alto Douro, Portugal); Manfred Tragner (University of Applied Sciences JOANNEUM Graz, Austria); Doug Black (Lawrence Berkeley National Laboratory, USA); José Baptista (INESC TEC - INESC Technology and Science - UTAD pole & University of Trás-os-Monte e Alto Douro, Portugal)

Wednesday, June 26 11:00 - 12:30

2W2: Special Session: Intelligent Management of Electrical Power Systems

Room 2: D. Luís

Chair: José Baptista (INESC TEC - INESC Technology and Science - UTAD pole & University of Trás-os-Monte e Alto Douro, Portugal)

11:00 ***Production Plan Rescheduling for Machine Breakdown Events Using a Genetic Algorithm***
Bruno Mota (Polytechnic of Porto, Portugal); Pedro Faria and Carlos Ramos (Polytechnic Institute of Porto, Portugal)

11:15 ***Flexibility Provision From Residential Houses: A Sensitive Analysis on Net Consumption Limits***
Ricardo Faia, Pedro Faria, Luis Gomes and Zita Vale (Polytechnic Institute of Porto, Portugal)

11:30 ***Reinforcement Learning Based Dispatch of Batteries***
Pedro Benedicto and Ricardo Silva (INESC TEC, Portugal); Clara Gouveia (INESC TEC Porto, Portugal)

11:45 ***A Nonstandard Time-Voltage-Current Characteristic for Overcurrent-Distance Coordination***
Hossein Ebrahimi (Aalto University, Finland & Urmia University, Iran); Amin Yazdaninejadi (Shahid Rajaee Teacher Training University, Iran); Sajjad Golshannavaz (University of Tehran & College of Engineering, Iran); Edris Pouresmaeil (Aalto University, Finland)

12:00 ***Hybrid Renewable Energy System Optimisation for Application in the Winemaking Sector***
Rita Teixeira (Univiversity of Trás-Os-Montes and Alto Douro, Portugal); Adelaide Cerveira (CIO - Centro de Investigacão Operacional, Portugal); Ana Silva (EDS-Energy Drawing Systems, Portugal); José Baptista (INESC TEC - INESC Technology and Science - UTAD pole & University of Trás-os-Monte e Alto Douro, Portugal)

12:15 ***The Impact of Optimizing Hybrid Renewable Energy System on Wine Industry Sustainability***
Beatriz Jesus (Univiversity of Trás-Os-Montes and Alto Douro, Portugal); Adelaide Cerveira (CIO - Centro de Investigacão Operacional, Portugal); Emanuel Santos (EDS-Energy Drawing Systems, Portugal); José Baptista (INESC TEC - INESC Technology and Science - UTAD pole & University of Trás-os-Monte e Alto Douro, Portugal)

Wednesday, June 26 11:00 - 12:30

2W3: Special Session: Empowering Healthcare: Patient-Centric Innovation and Technology Integration

Room 3: S. João

Chairs: Luca Faes (University of Palermo, Italy), Ana Paula Rocha (Universidade do Porto & CMUP, Portugal)

11:00 ***Model-Free Markers of Cardiovascular and Cerebrovascular Controls in Surgical and Transcatheter Aortic Valve Replacement Patients***

Vlasta Bari, Francesca Gelpi and Beatrice Cairo (University of Milan, Italy); Martina Anguissola, Elena Acerbi and Mattia Squillace (IRCCS Policlinico San Donato, Italy); Beatrice De Maria (IRCCS Istituti Clinici Scientifici Maugeri, Italy); Enrico Bertoldo and Valentina Fiolo (IRCCS Policlinico San Donato, Italy); Edward Callus (IRCCS Policlinico San Donato, Italy & University of Milan, Italy); Carlo De Vincentiis, Francesco Bedogni and Marco Ranucci (IRCCS Policlinico San Donato, Italy); Alberto Porta (Universita' degli Studi di Milano & IRCCS Policlinico San Donato, Italy)

11:15 ***Evaluation of Biometric Template Permanence for Electrocardiography (ECG) Based User Identification in Sanitary Facilities***

Aline dos Santos Silva (Institute for Systems and Computer Engineering, Technology and Science & Instituto de Telecomunicações, Portugal); Miguel V. Correia (University of Porto (FEUP) & INESC Technology and Science (INESCTEC), Portugal); Hugo Plácido da Silva (IT - Instituto de Telecomunicações & EST/IPS - Polytechnic Institute of Setúbal, Portugal)

11:30 ***Autonomic Stress in Plateau Waves of Intracranial Pressure: Spectral Mutual Information Rate Analysis***

Helder Pinto (University of Porto & CMUP, Portugal); Laura Sparacino and Yuri Antonacci (University of Palermo, Italy); Celeste Dias (Faculdade de Medicina Da Universidade Do Porto, Portugal); Riccardo Pernice (University of Palermo, Italy); Ana Paula Rocha (Universidade do Porto & CMUP, Portugal)

11:45 ***Knowledge-Based Reliability Assessment of Models With Application to Risk Stratification***

Zhan Zhao (University of Coimbra, Portugal); Paulo Gil (Universidade Nova de Lisboa, Portugal); João Loureiro, Jorge Henriques and Lorena Petrella (University of Coimbra, Portugal)

12:00 ***Assessment of EEG Brain Dynamics in Time and Frequency Domains Through Information-Theoretic Measures***

Yuri Antonacci, Laura Sparacino and Valeria Rosalia Vergara (University of Palermo, Italy); Gorana Mijatovic (Faculty of Technical Sciences, University of Novi Sad, Serbia); Riccardo Pernice and Luca Faes (University of Palermo, Italy)

12:15 ***A Classification Method Based on Local Information and Nearest Neighbor Entropy Estimation***

Ivan Lazic (University of Novi Sad, Serbia); Gorana Mijatovic (Faculty of Technical Sciences, University of Novi Sad, Serbia); Marta Iovino (University of Palermo, Italy); Tatjana Loncar-Turukalo (University of Novi Sad, Serbia); Luca Faes (University of Palermo, Italy)

Wednesday, June 26 11:00 - 12:30

2W4: Special Session: Machine Learning in the Future of Healthcare

Room 4: Miragaia

Chair: Raquel Sebastião (IEETA, University of Aveiro, Portugal)

11:00 ***Feature Selection and Comparison of Classifiers for Reinke's Edema Identification***

Rogerio Pignelli and Paulo Rogério Scalassara (Federal University of Technology - Paraná, Brazil); María E Dajer (University of São Paulo, Brazil); Danilo Hernane Spatti (University of Sao Paulo, Brazil)

11:15 ***Facial Electromyography and Its Relation With Emotional States***

Adriana Moreira Santos and Susana Brás (Universidade de Aveiro, Portugal)

11:30 ***A Neural Network Approach for the Prediction of Arrhythmic Events in Patients With Brugada Syndrome via ECG Features Analysis***

Silvia Caligari and Vincenzo Randazzo (Politecnico di Torino, Italy); Fiorenzo Gaita, Carla Giustetto and Michele Millesimo (University of Turin, Italy); Eros GA Pasero (Politecnico of Turin, Italy & Neuronica Lab, Italy)

11:45 ***Pain Assessment Through Physiological Signals***

Bruna Alves and Susana Brás (IEETA, DETI, LASI, University of Aveiro, Portugal); Raquel Sebastião (IEETA, DETI, LASI, University of Aveiro, Portugal and ESTGV, Polytechnic Institute of Viseu, Portugal)

12:00 ***A Comparative Study of Feature-Based and End-To-End Approaches for Lung Nodule Classification in CT Volumes to Lung-RADS Follow-Up Recommendation***

Carlos Alexandre Ferreira (Faculty of Engineering of University of Porto & INESC TEC, Portugal); Isabel Ramos (São João University Hospital, Portugal); Miguel Coimbra (University of Porto, Portugal); Aurélio Campilho (Université of Porto, Portugal)

12:15 ***Lightweight 3D CNN for the Segmentation of Coronary Calcifications and Calcium Scoring***

Rui Santos (INESC TEC, Portugal); Rúben Baeza (University of Porto, Portugal); Vítor Manuel Filipe and Francesco Renna (INESC TEC, Portugal); Hugo Paredes (University of Trás-Os-Montes e Alto Douro & INESC TEC, Portugal); João Pedrosa (University of Porto, Portugal)

Wednesday, June 26 11:00 - 12:30

2W5: Special Session: Advancements in Radar-Based Human Monitoring

Room 5: Arrábida

Chairs: Daniel Albuquerque (ESTGA - University of Aveiro, Portugal), Ana Patrícia Rocha (University of Aveiro, Portugal)

11:00 ***Wide-Scan/High-Gain Phased Array Antenna for 5G/6G Cellular Networks***

Haleh Jahanbakhsh Basherlou (Edinburgh Napier University, United Kingdom (Great Britain)); Naser Ojaroudi Parchin (Edinburgh Napier University, United Kingdom, United Kingdom (Great Britain));

Mohammad Alibakhshikenari (Universidad Carlos III de Madrid, Spain); Lida Kouhalvandi (Dogus University, Turkey); Chan Hwang See (Edinburgh Napier University, United Kingdom (Great Britain))

11:15 ***Radar-Based Human Movement Detection and Classification for Smart Homes Applications***
André Rouco and Tiago Couto (Instituto de Telecomunicações, DETI, Universidade de Aveiro, 3810-193 Aveiro, Portugal); Rodrigo Almeida (Bosch Termotecnologia, Portugal); Carolina T. S. Gouveia (Instituto de Telecomunicações, Aveiro & University of Aveiro, Portugal); Daniel Albuquerque (ESTGA - University of Aveiro, Portugal); Susana Brás (Universidade de Aveiro, Portugal); Pedro Pinho (UA - Universidade de Aveiro & IT - Instituto de Telecomunicações, Portugal)

11:30 ***Heartbeat Estimation and Respiratory Arrhythmia Detection Using 24 GHz Radar Signals***
Michelle Tchameni (Hochschule Trier, Germany); Volker Lücken (Trier University of Applied Sciences, Germany); Udo Schröder (IEE S.A., Luxembourg); Andreas R. Diewald (Hochschule Trier, Germany)

11:45 ***Dual-Radar Integration for Vital Signs Acquisition Under Heavy Body Movement Using Machine Learning***
Gonçalo Gomes (IEETA, LASI, DETI, Universidade de Aveiro, 3810-193, Aveiro); Carolina T. S. Gouveia (Instituto de Telecomunicações, Aveiro & University of Aveiro, Portugal); Daniel Albuquerque (ESTGA - University of Aveiro, Portugal); Susana Brás (Universidade de Aveiro, Portugal); Pedro Pinho (UA - Universidade de Aveiro & IT - Instituto de Telecomunicações, Portugal)

12:00 ***Evaluation of YOLOv3-Based Radar Data Processing for Indoor Positioning: Application of mmDetect***
Michela Raimondi and Antonio Nocera (Università Politecnica Delle Marche, Italy); Maria Gardano (UnivPM, Italy); Gianluca Ciattaglia (Polytechnic University of Marche, Italy); Linda Senigagliesi (Università Politecnica delle Marche, Italy); Ennio Gambi (Universita' Politecnica Delle Marche, Italy)

Wednesday, June 26 14:00 - 16:00

3W1: Energy Storage

Room 1: D. Maria
Chair: Kyriaki-Nefeli Malamaki (Aristotle University of Thessaloniki, Greece)

14:00 ***Impact of the C-Rates and AC-AC RTE on the Annual Cycles and Operation Cost of Different Battery Technologies That Provide Market Services***
Piedy Del Mar Agamez Arias (University of Porto & INYCIA Research Group, Portugal); Vladimiro Miranda (University of Porto, Portugal)

14:15 ***Second Life Electric Vehicle Batteries for Stationary Energy Storage Applications: An Analysis of Technical and Economic Feasibility***
Ibrahim Sengor (Munster Technological University, Ireland); Barry Hayes (University College Cork, Ireland)

14:30 ***Optimal Sizing and Energy Management of Battery Energy Storage Systems for Hybrid Offshore Farms***
Sofia Varotto (University of Porto & INESC TEC, Portugal); Vincenzo Trovato (University of Trento, Italy

& Imperial College London, United Kingdom (Great Britain)); Ehsan Kazemi-Robati (INESC TEC, Portugal); Bernardo Silva (University of Porto and INESC TEC Porto Portugal, Portugal)

14:45 ***Input Data Importance Analysis for Various Machine Learning Techniques in Task of Short-Term Electricity Demand Forecasting in Industrial Plant***

Łukasz Rokicki, Paweł Piotrowski, Marcin Kopyt and Mirosław Parol (Warsaw University of Technology, Poland)

15:00 ***Impact of Micro-Cycles on the Lifetime of Lithium Ion Batteries – EIS Analysis***

Kateřina Nováková (Czech Technical University in Prague, Czech Republic); Alberto Berrueta (Public University of Navarre (UPNA) & Institute of Smart Cities (ISC), Spain); Adrian Soto (Universidad Publica de Navarra, Spain); Pablo Sanchis (Public University of Navarre, Spain); Alfredo Ursúa (Public University of Navarra, Spain)

15:15 ***Techno-Economic Comparison of Lithium-Ion, Lead-Acid, and Vanadium-Redox Flow Batteries for Grid-Scale Applications: A Case Study of Renewable Energy Microgrid Planning With Battery Storage in Morocco***

Oumaima Mahir (Sidi Mohamed Ben Abdellah University & Green Energy Park, Morocco); Abdelilah Rochd (Green Energy Park, Morocco & Hassan II University of Casablanca, Morocco); Hicham Ghennioui (LSSC, Faculty of Sciences and Technologies, University of Sidi Mohammed Ben Abdellah, Fez, Morocco); Bouthaina El Barkouki (Mohammed V University, Morocco); Aboubakr Benazzouz (Green Energy Park, Morocco); Hicham Oufettoul (Engineering for Smart and Sustainable Systems Research Centre, Mohammadia Schoo, Morocco)

15:30 ***Techno-Economic Evaluation of PV Solar Power Generation System and EV Charging for Services Building With HOMER Grid Software***

Lucélio Manuel Costa (University of Coimbra & INESC Coimbra, Portugal); Álvaro Gomes (University of Coimbra (DEEC) & INESC Coimbra, Portugal); Paulo G. Pereirinha (Portugal)

15:45 ***Parametric Control Design for Recovery of Fast Storage Systems After Virtual Inertia Provision***

Kyriaki-Nefeli Malamaki and Chrysanthos Mitakos (Aristotle University of Thessaloniki, Greece); Juan Manuel Mauricio (University of Seville, Spain); Charis Demoulias (Aristotle University of Thessaloniki, Greece)

Wednesday, June 26 14:00 - 16:00

3W2: Renewable Energy Systems II

Room 2: D. Luís

Chair: Pedro Salomé (Universidade de Aveiro, Portugal)

14:00 ***RoCoF Mitigation in the Italian Transmission Network: A Methodology for Inertia Optimization***

Matteo Fresia and Manuela Minetti (University of Genoa, Italy); Andrea Bonfiglio and Renato Procopio (University of Genova, Italy); Giuseppe Lisciandrello and Luca Orrù (Terna SpA, Italy)

14:15 ***Preliminary Statistical Analysis of Variability in Renewable Energy Production - Case Study***

Dubravko Sabolić (Croatian Transmission System Operator, Croatia & University of Zagreb, Croatia);

Igor Ivankovic (CroatianTransmission System Operator, HOPS, Croatia); Antun Andric (Croatian Transmission System Operator Ltd., Croatia); Gordana Donković (Croatian Transmission System Operator, Croatia)

14:30 ***A Comprehensive Review of Biofuel and Bioplastic Production From Microalgae***
Maysaa Basbous, Jihane Rahbani El-Mounsef, Jihad Hokayem and Hadi Y. Kanaan (Saint-Joseph University of Beirut, Lebanon)

14:45 ***Improving Stability of Reduced Inertia Transmission Systems***
Margarida Inês Pereira (Vestas Wind Systems, Portugal & Faculdade de Engenharia Da Universidade Do Porto, Portugal); Carlos Moreira (INESC-TEC, Portugal)

15:00 ***The Influence of a Rooftop Photovoltaic System on the Electricity Consumption of a Plastic Moulding Plant: A Carbon Footprint Assessment***
Carlos Hernandez (ADAI - University of Coimbra, Portugal); Jônatas Augusto Manzolli (INESC Coimbra - University of Coimbra, Portugal); Tânia R. Simões and João Redol (Neutroplast S.A., Portugal); Carla Rodrigues and Fausto Freire (ADAI - University of Coimbra, Portugal)

15:15 ***Performance of Time-Domain Line Protection Using Hardware-In-The-Loop Simulations on a System With Inverter-Based Resource***
Renan Silva do Carmo (Military Institute of Engineering, Brazil); Marcos Vinícius Pimentel Teixeira (Instituto Militar de Engenharia, Brazil); Paulo Cesar Pellanda, Prof. and Daiana Antonio da Silva (Military Institute of Engineering, Brazil)

15:30 ***Digital Twin Design Framework for Photovoltaic Generation Systems Using FMU and Modelica***
Pablo José Hueros-Barrios, Francisco Javier Rodríguez-Sánchez, Pedro Martín-Sánchez, Miguel Tradacete-Ágreda and Carlos Santos-Pérez (University of Alcalá, Spain)

15:45 ***Evaluation of Grid-Following Inverter Control Models for Fault Response and Their Impact on Protection Devices***
Veronica A Rosero (National University of San Juan, Argentina); Francisco Gonzalez-Longatt (University of South-Eastern Norway & Venezuelan Wind Energy Association, Norway); Eduardo Orduña (National University of San Juan, Argentina); Jose Miguel Riquelme-Dominguez (University of Seville, Spain)

Wednesday, June 26 14:00 - 16:00

3W3: Artificial Intelligence & Machine Learning in Health

Room 3: S. João
Chair: João C Ferreira (ISCTE, Portugal)

14:00 ***Prediction of Emergency Department Operations With Artificial Intelligence: A Case Study***
Luis Elvas (University College of Molde & Inov Inesc Inovação-Instituto de Novas Tecnologias, Portugal); Miguel B. Nunes (ISCTE-IUL, Portugal); Berit Irene Helgheim (Molde University College, Portugal); João C Ferreira (ISCTE, Portugal)

14:15 ***Enhancing Intake Monitoring: Transfer Learning for Audio-Based Detection of Swallowing Events***
Xin Chen and Ernest Kamavuako (King's College London, United Kingdom (Great Britain))

14:30 ***Edge-AI on Wearable Devices: Myocardial Infarction Detection With Spectrogram and 1D-CNN***
Maria Gragnaniello (Università degli Studi di Napoli Federico II, Italy); Fiona Balbi and Gabriella Martellotta (University of Naples Federico II, Italy); Alessandro Borghese (Università di Napoli, Italy); Vincenzo Romano Marrazzo, Luca Maresca, Giovanni Breglio, Andrea Irace and Michele Riccio (University of Naples Federico II, Italy)

14:45 ***Differentiating Fluid-Intake-Related Swallowing Events From Saliva and Solid Food Intake Using Swallowing Sounds and Conventional Machine Learning***
Iman Ahmed Ismail and Ernest Kamavuako (King's College London, United Kingdom (Great Britain))

15:00 ***Overcoming the Small Dataset Challenge in Healthcare***
Daniela Pais (IEETA, University of Aveiro, Portugal); Susana Brás (Universidade de Aveiro, Portugal); Raquel Sebastião (IEETA, University of Aveiro, Portugal)

15:15 ***Exploring Hybrid Quantum-Classical Machine Learning for Respiratory Sound Analysis***
Diego García-Vega and Samuel González-Castillo (University of Oviedo, Spain); Francisco Gonzalez-Martinez and Jaime Garcia-Martinez (University of Jaen, Spain); Elías F. Combarro (University of Oviedo, Spain); Francisco Canadas-Quesada (University of Jaen, Spain); Jose Ranilla (University of Oviedo, Spain)

15:30 ***Deep Learning Approach for Response Assessment to Low Intensity Emotional Stimuli***
Damiano Fruet, Claudio Mulatti, Barbara Treccani, Deborah Ferrante and Giandomenico Nollo (University of Trento, Italy)

Wednesday, June 26 14:00 - 16:00

3W4: Communications Systems

Room 4: Miragaia
Chair: Randy Verdecia-Peña (Universidad Politécnica de Madrid, Spain)

14:00 ***Cluster-Based Approach for Cellular Traffic Prediction With Machine Learning Methods***
Daniel Correia (Universidade de Aveiro, Portugal); Filipe Pinto (Alticelabs, Portugal); Susana Sargento (Instituto de Telecomunicações, Universidade de Aveiro, Portugal); Petia Georgieva (University of Aveiro, DETI/IEETA & Institute of Electronics Engineering and Telematics of Aveiro (IEETA), Portugal)

14:15 ***Performance Analysis of IEEE 802.11ay Sectors Sweep Management***
Diogo Pereira (Universidade Nova de Lisboa, Portugal & Instituto de Telecomunicações, Portugal); Rodolfo Oliveira (Nova University of Lisbon, Instituto de Telecomunicações, Portugal); Daniel Benevides da Costa (King Fahd University of Petroleum & Minerals, Saudi Arabia); Hyong Kim (Carnegie Mellon University, USA)

14:30 ***Multi-Band Resonant Photonic Crystal Antenna for 5G Applications***
Nila Bagheri (Instituto de Telecomunicações and Universidade Da Beira Interior, Portugal); Emanuel Bordalo Teixeira (Universidade da Beira Interior & Instituto de Telecomunicações, Portugal); Fernando J. Velez (University of Beira Interior & Instituto de Telecomunicações, Portugal); Jon M. Peha (Carnegie Mellon University & White House Office of Science & Technology Policy, USA)

14:45 ***5G Wireless Channel Estimation: Addressing PHY-Layer Impairments Through Model-Based Deep Learning***

Randy Verdecia-Peña (Universidad Politécnica de Madrid, Spain); Rodolfo Oliveira (Nova University of Lisbon, Instituto de Telecomunicações, Portugal); José I. Alonso (Universidad Politécnica de Madrid, Spain)

15:00 ***Highly Flexible and Scalable Millimeter Wave Software Defined Radio***

João G. C. Silva (Instituto Politécnico de Leiria, Portugal); Luís Mendes (Polytechnic of Leiria & Instituto de Telecomunicações, Portugal); Joao Caldinhas Vaz (Universidade de Lisboa & Instituto Superior Técnico, Portugal)

15:15 ***Incremental Redundancy HARQ Communication Schemes Applied to Energy Efficient IoT Systems***

Sérgio M. Silva and Nuno T. Almeida (INESC TEC and University of Porto, Portugal)

15:30 ***Enhancing Indoor Localisation: A Bluetooth Low Energy (BLE) Beacon Placement Approach***

João Dias (Polytechnic of Porto, Portugal); Duarte Oliper and Miguel Roque Soares (Fraunhofer Portugal AICOS, Portugal); Paula Viana (Polytechnic of Porto-ISEP & INESC TEC, Portugal)

15:45 ***Detection of Overheating in Electrical Systems Based on Passive HF RFID Technology***

Wojciech Piasecki and Artur Zawadzki (ABB Corporate Technology Center, Poland)

Wednesday, June 26 14:00 - 16:00

3W5: Power Electronics

Room 5: Arrábida

Chair: Shomi Ahmed (University of Winnipeg, Canada)

14:00 ***Improving Transient Stability of Power System Through HVDC Controls***

Tuan-Quoc Tran (CEA-INES, France); Hung-Cuong Nguyen (Univ Grenoble Alpes - G2Elab, France); Minh Cong Pham (CEA Liten - INES, France)

14:15 ***Complex-Valued Sliding Mode Control for a Stand-Alone Three-Phase CSI Modelled With an Ideal Current Source***

Leila Rahimi (Universitat Politecnica de Catalunya Barcelona, Spain); Arnau Doria-Cerezo (Universitat Politècnica de Catalunya, Spain)

14:30 ***Efficient Control Scheme for Compensating Voltage Unbalance and Harmonics in Islanded Microgrid Inverters***

Ali Gaeed, Enrique Romero-Cadaval and Carlos Roncero-Clemente (Power Electrical and Electronics R&D Group. University of Extremadura, Spain); Mahmood Swadi (College of Engineering, University of Baghdad, Iraq)

14:45 ***Virtual Oscillator Control for Enhanced Grid Stability in Inverter-Based Power Systems***

Quang-Khanh Pham, Duy Vo Thanh and Linh Hoai Tran (Hanoi University of Science and Technology, Vietnam); Joao Pedro Trovao (University of Sherbrooke & IPC-ISEC, Canada); Bao Huy Nguyen (Hanoi University of Science and Technology, Vietnam)

15:00 ***On Harmonic Properties of Carrier-Based Asynchronous Modulation Strategies for Dual-Inverter Topology***

Filip Baum, Jakub Kucera, Petr Zakopal and Jan Bauer (Czech Technical University in Prague, Czech Republic); Ondrej Lipcak (Czech Technical Iniversity in Prague, Czech Republic)

15:15 ***Switching Loss Reduction in Dual Inverter Topology Using Optimized Modulation Strategy***

Jakub Kucera, Filip Baum and Petr Zakopal (Czech Technical University in Prague, Czech Republic); Ondrej Lipcak (Czech Technical Iniversity in Prague, Czech Republic); Jan Bauer (Czech Technical University in Prague, Czech Republic)

15:30 ***FPGA-Based Unit for Selective Harmonic Elimination in Voltage-Source Inverters***

Petr Zakopal, Jakub Kucera and Filip Baum (Czech Technical University in Prague, Czech Republic); Ondrej Lipcak (Czech Technical Iniversity in Prague, Czech Republic); Jan Bauer (Czech Technical University in Prague, Czech Republic)

15:45 ***Decision-Making Models in the Optimization of Electric Vehicle Charging Station Locations: A Review***

João Campos Pinto and Vitor Filipe (Universidade de Trás-os-Montes e Alto Douro, Portugal); José Baptista (INESC TEC - INESC Technology and Science - UTAD pole & University of Trás-os-Monte e Alto Douro, Portugal); António Oliveira (EDS - Energy Drawing Systems, Portugal); Tiago Pinto (University of Trás-Os-Montes and Alto Douro, Portugal)

Wednesday, June 26 16:30 - 18:00

4W1: Special Session: Enabling Electric Mobility for Sustainable Grids, Cities and Society

Room 1: D. Maria

Chairs: Hugo Morais (INESC-ID, Portugal), Matej Zajc (University of Ljubljana, Slovenia)

16:30 ***A Dynamic Prediction Tool for Vehicle-To-Grid Operation and Planning***

Babak Ravanbach, Elif Turhan and Niklas Wulff (DLR Institute of Networked Energy Systems, Germany); Stavros Orfanoudakis and Pedro P. Vergara (Delft University of Technology, The Netherlands); Vahid Vahidinasab (Nottingham Trent University, United Kingdom (Great Britain)); Luiz Dias (NEW Centre for NEW Energy Technologies, Portugal); Goncalo Mendes (Lappeenranta University of Technology, Finland)

16:45 ***Impact of V2G Electric Vehicles in the Fast Frequency Support of Non-Synchronous Power Systems***

Sergio Bruno, Cosimo Iurlaro and Massimo La Scala (Politecnico di Bari, Italy); Eleonora Riva Sanseverino, Giuseppe Sciume and Gaetano Zizzo (University of Palermo, Italy)

17:00 ***Graph-Based Routing Algorithm for Request Response and Charging of Shared Autonomous Electric Vehicles***

Reza Razi (Centrale Lille, France); Haider Ali and Frederic Colas (L2EP, France); Bruno François (Ecole Centrale de Lille & L2EP, France)

17:15 ***Bidirectional Charging as a Contribution to the Energy and Mobility Transitions: A Methodology for Modelling***

Moritz Bergfeld (German Aerospace Center (DLR), Germany); Carsten Hoyer-Klick, Marianna Rottoli and John E. Anderson (German Aerospace Center, Germany)

17:30 ***Optimising Microgrid Energy Management: A MILP Approach for Cost Reduction and Grid Resilience***

Diego Carreño (Eurecat, Technology Centre of Catalonia); Regina Enrich Sard (EURECAT, Spain); Pol Torres Álvarez (Eurecat, Spain)

17:45 ***Estimation of Electric Vehicles With V2G Capabilities Potential for Market Participation***

Tim Marentic and Igor Mendek (ULFE, Slovenia); Anton Kos (Elektro Celje, Slovenia); Matej Malensek (GEN-I, Slovenia); Hugo Morais (INESC-ID, Portugal); Matej Zajc (University of Ljubljana, Slovenia)

Wednesday, June 26 16:30 - 18:00

4W2: Energy Management I

Room 2: D. Luís

Chair: Cleberton Reiz (INESC TEC, Brazil & São Paulo State University (UNESP), Brazil)

16:30 ***Performance Assessment of Electricity Market Zones Reconfiguration: The Italian Case***

Haoke Wu and Tao Huang (Politecnico di Torino, Italy); Stefania Conti (University of Catania, Italy); Ettore Bompard (Politecnico Torino, Italy)

16:45 ***Efficient Power Flow Algorithm for Unbalanced Three-Phase Distribution Networks Using Recursion and Parallel Programming***

Mariana de Souza (INESC TEC, Portugal); Jonatas Leite (São Paulo State University (UNESP), Brazil); Cleberton Reiz (INESC TEC, Brazil & São Paulo State University (UNESP), Brazil)

17:00 ***Navigating Energy Market Dynamics: A Preliminary Framework for Anomaly Detection in Balancing Utilities***

Patrali Majumder (Fraunhofer Institute for Factory Operation and Automation, Germany); Jens Götze (Fraunhofer Institute for Factory Operation and Automation IFF, Germany); Marc Richter (Fraunhofer IFF Magdeburg, Germany); Przemyslaw Komarnicki (Fraunhofer IFF, Germany)

17:15 ***A Comparison of Univariate Methods for Day-Ahead Short-Term Load Forecasting***

Giorgia Ghione (Politecnico di Torino, Italy); Malik Ali Judge (University of Palermo, Italy); Marco Badami (Politecnico di Torino, Italy); Eros GA Pasero (Politecnico of Turin, Italy & Neuronica Lab, Italy); Vincenzo Franzitta (University of Palermo, Italy); Giansalvo Cirrincione (University of Picardie Jules Verne, Ameins, France)

17:30 ***Measurement of Time Domain Parameters for Series Arc Fault Detection. Sensitivity Analysis in the Presence of Noise***

Giovanni Artale (University of Palermo, Italy); Antonio Cataliotti (Università degli Studi di Palermo, Italy); Valentina Cosentino (University of Palermo, Italy); Dario Di Cara (National Research Council, Italy); Antonio Di Stefano (Prysmian Electronics, Italy); Vito Ditta (Università degli Studi di Palermo, Italy);

Nicola Panzavecchia (National Research Council, Italy); Giovanni Tinè (Italian National Research Council, Italy & Institute of Marine Engineering - PALERMO UNIT, Italy); Aurelio Zinno (University of Palermo, Italy)

Wednesday, June 26 16:30 - 18:00

4W3: E-Health I

Room 3: S. João

Chair: Francisco Canadas-Quesada (University of Jaen, Spain)

16:30 ***Plasmonic Nanoantennas to Exploit Extraordinary Optical Transmission in Biosensing***

Ricardo A. Marques Lameirinhas (Instituto Superior Técnico & Instituto de Telecomunicações, Portugal); Catarina P. Correia V. Bernardo (Instituto Superior Técnico, Portugal); João Paulo N. Torres (Instituto de Telecomunicações, Portugal); António Baptista (Instituto Superior Técnico, Portugal); Maria João Martins (Academia Militar, Portugal)

16:45 ***Development of Data Ingestion Pipelines for the Federated Use of Biomedical Data in Research: The Health Big Data Project***

Pierluigi Reali, Alessandro Carotenuto, Davide Piantella, Letizia Tanca, Pierluigi Plebani and Maria G Signorini (Politecnico di Milano, Italy)

17:00 ***To Be or Not to Be... Awake? A Comparison of Subjective and Objective Methods for Drowsiness Detection in Drivers***

Sara Groppo, Michele Guagnano, Luigi Pugliese, Jacopo Sini and Massimo Violante (Politecnico di Torino, Italy)

17:15 ***Respiratory Rate Estimation Applying Non-Negative Matrix Partial Co-Factorization From Breath Sounds***

Alejandro Salvador-Navarro, Jaime Garcia-Martinez, Francisco Gonzalez-Martinez and Juan Torre-Cruz (University of Jaen, Spain); Pablo Revuelta-Sanz (University of Oviedo, Spain); Raquel Cortina (Universidad de Oviedo, Spain); Francisco Canadas-Quesada (University of Jaen, Spain)

17:30 ***Using Flowise to Streamline Biomedical Data Discovery and Analysis***

João António Reis, João Rafael Almeida, Tiago Melo Almeida and José Luís Oliveira (University of Aveiro, Portugal)

17:45 ***Just Noticeable Difference in Depth Perception for Biomedical Robotics Applications***

Arda Gok, Gokce Nur Yilmaz, Kutluk Bilge Arikan and Yucel Cimtay (TED University, Turkey)

Wednesday, June 26 16:30 - 18:00

4W4: Smart Industry and Manufacturing

Room 4: Miragaia

Chair: Pedro Correia (Ci2, Smart Cities Research Center, Polytechnic Institute of Tomar, Portugal)

16:30 ***Demonstration Quality-Based Teleoperated Learning With Visual and Haptic Data in Bandwidth-Limited Environments***

Diego Fernandez Prado and Prashanth Ramachandrareddy (Technical University of Munich, Germany); Eckehard Steinbach (Technische Universität München, Germany)

16:45 ***Real-Time Optical Acquisition and Classification System for Microbiology Applications***

Telmo Marques (School of Technology of Tomar, Polytechnic Institute of Tomar, Portugal); Pedro Correia, Manuel Barros and Henrique Pinho (Ci2, Smart Cities Research Center, Polytechnic Institute of Tomar, Portugal); Dina Mateus (TechnArt Research Centre, Polytechnic Institute of Tomar, Portugal); Rui Gonçalves (Ci2, Smart Cities Research Center, Polytechnic Institute of Tomar, Portugal)

17:00 ***Adaptive Feedforward Control for Disturbance Compensation in Modular Mechatronic Systems***

Rémy Carlier (Ghent University & Flanders Make, Belgium); Kurt Stockman (Ghent University Campus Kortrijk, Belgium); Jeroen De Kooning (Ghent University, Belgium)

17:15 ***Transforming Collaboration: A Vision for Human-Aware Robots to Enhance Worker Safety and Boost Production Efficiency***

Mohammad Zarei, Andrey Solovov and Vishal Gautam (University of Coimbra & Institute of Systems and Robotics, Portugal); Bruno Ferreira (Institute of Systems and Robotics - University of Coimbra, Portugal); Gustavo Assunção (University of Coimbra & Institute of Systems and Robotics, Portugal); Antonio Marin-Hernandez (Universidad Veracruzana, Mexico & Universidade de Coimbra, Portugal); Paulo Menezes (Universidade de Coimbra, Portugal)

17:30 ***Analysis of a very low-cost Coaxial-Waveguide- Transition (CWT) based on symmetric structures***

Marius Falk and Simon Müller (Hochschule Trier, Germany); Volker Lücken (Trier University of Applied Sciences & Chair for Integrated Signal Processing Systems, Germany); Andreas R. Diewald (Hochschule Trier, Germany)

17:45 ***Unleashing the Full Potential: Increasing the Bit Configuration Options in Configurable Ring Oscillator PUF***

Husam Kareem and Oliver Krammer (Budapest University of Technology and Economics, Hungary); Dmitriy Dunaev (BME, Hungary)

Wednesday, June 26 16:30 - 18:00

4W5: Smart Mobility and Transportation

Room 5: Arrábida

Chair: Goncalo Mendes (Lappeenranta University of Technology, Finland)

16:30 ***User-Centric Charging Service Recommendation for Electric Vehicles***

Zeinab Teimoori and Abdulsalam Yassine (Lakehead University, Canada)

16:45 ***Geospatial Risk Assessment of Cyclist Accidents in Urban Areas: A K-Means Clustering Approach***

Bernardo Brito (Federal University of Rio Grande do Norte, Brazil); Daniel G. Costa (University of Porto, Portugal); Ivanovitch Silva (Federal University of Rio Grande do Norte, Brazil)

17:00 ***A Two-Stage Approach Combining Constraint-Based Algorithms and Gaussian Process Regression for Estimation of Cruise Ship Hotel Loads***
Alexander Micallef, Maurice Apap, John Licari and Cedric Caruana (University of Malta, Malta)

17:15 ***Strategic and Multidisciplinary Analysis of Increasing Airport Capacity in the Lisbon Region***
Rui Ferreira and Marco Araujo (Capgemini Engineering, Portugal); Anabela Pereira Tereso and Paulo Novais (University of Minho, Portugal)

17:30 ***LoRaWAN Based Street Lighting for Remote Areas With Shadow Zones***
João Ferreira and João Cardoso (Coimbra Polytechnic - ISEC, Portugal); Pedro Amaro (Coimbra Polytechnic - ISEC, Coimbra, Portugal); Cristina I. Faustino Agreira (Coimbra Polytechnic, Portugal)

17:45 ***In-Vehicle Camera Sensing: Hardware, Urban Applications and Research Trends***
Sara B Carvalho and Daniel G. Costa (University of Porto, Portugal)

Thursday, June 27

Thursday, June 27 8:30 - 9:30

1T1: Personalised Medicine

Room 1: D. Maria
Chair: João Paulo Silva Cunha (INESC TEC / FEUP, University of Porto, Portugal)

8:30 ***An Open Source Mask-Based Turbine Spirometer for Respiratory Function Assessment***
Mariana Bernardino (Instituto Superior Técnico, Portugal); Hugo Plácido da Silva (IT - Instituto de Telecomunicações & EST/IPS - Polytechnic Institute of Setúbal, Portugal)

8:45 ***Experimental Evaluation of an Adaptive Gain Sensor for Electrodermal Activity Monitoring in a Smart Sock Form Factor***
Afonso Fortes Ferreira (Instituto de Engenharia de Sistemas e Computadores (INESC), Portugal); Hugo Plácido da Silva (IT - Instituto de Telecomunicações & EST/IPS - Polytechnic Institute of Setúbal, Portugal); Helena Alves (University of Aveiro, Portugal); Ana Fred (I.S.T. - Technical U. Lisbon / I.T. Lisbon, Portugal)

9:00 ***Post-Operative Recovery Process Assessment of Total Hip Arthroplasty With Instrumented Implant***
Carlos Rodrigues (University of Porto & INESC TEC - Institute for Systems and Computer Engineering, Technology and Science, Portugal); Miguel V. Correia (University of Porto (FEUP) & INESC Technology and Science (INESCTEC), Portugal); João Abrantes (Lusófona University, Portugal); Marco Benedetti Rodrigues (Federal University of Pernambuco, Brazil); Jurandir Nadal (PEB/UFRJ, Brazil)

9:15 ***A Wearable Quantified Approach to Parkinson's Disease Gait Motor Symptoms***
Adriana Arrais and Rita Duarte Vieira (INESCTEC, Portugal); Duarte Dias (INESC TEC, Portugal); Carolina Soares (Centro Hospitalar Universitário São João and FMUP, Portugal); João Massano (Centro Hospitalar Universitário de São João & University of Porto, Portugal); João Paulo S. Cunha (INESC TEC and FEUP, Portugal)

Thursday, June 27 8:30 - 9:30

1T2: Energy Storage

Room 2: D. Luís

Chair: Emanuele Ogliari (Politecnico di Milano, Italy)

8:30 ***Control Scheme for Multi-Energy Microgrids With Power, Heating, Cooling, and Hydrogen Vectors***
Pablo Horrillo-Quintero, Pablo García, Ehsan Hosseini, Carlos Andrés García, Higinio Sanchez-Sainz and Luis M. Fernández-Ramírez (University of Cadiz, Spain)

8:45 ***Simulink-Based Simulation of Electric Bicycle Dynamics and Regenerative Braking for Battery State of Charge Assessment***
Fabio Corti (University of Florence, Italy); Marcello Minervini and Paolo Giangrande (University of Bergamo, Italy); Alberto Reatti (University of Florence, Italy); Paolo Malighetti (University of Bergamo, Italy); Luca Pugi (University of Florence, Italy)

9:00 ***Supercapacitor-Enabled Energy-Autonomous Wireless Sensor Node for Sustainable and Remote Sensing Applications***
Roberto La Rosa and Stefano Spaziani (STMicroelectronics, Italy); Fernanda Irrera (University of Roma La Sapienza, Italy)

9:15 ***Data Augmented Rule-Based Expert System to Control a Hybrid Storage System***
Ricardo Bessa (INESC TEC, Portugal); Francisco Lobo (INESC TEC & University of Porto, Portugal); Francisco Fernandes (INESC TEC, Portugal); Bernardo Silva (INESC TEC and FEUP - University of Porto, Portugal)

Thursday, June 27 8:30 - 10:30

1T3: Communications Networks

Room 3: S. João

Chair: Bruno Chang (Federal University of Technology - Paraná, Brazil)

8:30 ***Optimizing Load Balancing and Minimizing Communication Latency in Edge Networks***
Efthymios Oikonomou and Angelos Rouskas (University of Piraeus, Greece)

8:45 ***Analysis and Prediction of Multicell Handovers in 5G Networks Applying Logistic Regression***
Alison Michel Fernandes (UTFPR - Universidade Tecnológica Federal Do Paraná, Brazil); Hermes I Del Monego (UTFPR, Brazil); Bruno Chang (Federal University of Technology - Paraná, Brazil); Anelise Munaretto (UTFPR, Brazil)

9:00 ***Assessing Kubernetes Distributions: A Comparative Study***
Pedro Ascensão, Luís Filipe Neto and Karima Velasquez (University of Coimbra, Portugal); David Perez Abreu (University of Coimbra, Portugal & Instituto Pedro Nunes, Portugal)

9:15 ***Forecasting and Improving Latency in 5G V2X Networks for Autonomous Driving Scenarios***
Raul F. D. Barbosa (Universidade de Aveiro, Portugal & Capgemini, Portugal); Petia Georgieva

(University of Aveiro, DETI/IEETA & Institute of Electronics Engineering and Telematics of Aveiro (IEETA), Portugal); Susana Sargento and Pedro Rito (Instituto de Telecomunicações, Universidade de Aveiro, Portugal); Marco Araujo and Adriano Almeida Goes (Capgemini Engineering, Portugal)

9:30 ***Road to Dynamic Functional Split in Radio Access Networks***
Ricardo J. B. Pousa, Giang T. Nguyen and Riccardo Bassoli (Technische Universität Dresden, Germany); Frank H.P. Fitzek (Technische Universität Dresden & ComNets - Communication Networks Group, Germany)

9:45 ***Exploring Multi-Access Edge Computing Federation for V2X Scenarios in the Route 25 Project***
João Pedro Fonseca (Instituto de Telecomunicações & Universidade de Aveiro & Capgemini Engineering); David Santos (Instituto de Telecomunicações & Universidade de Aveiro, Portugal); Emanuel Vieira (University of Aveiro & Instituto de Telecomunicações, Portugal); João Donato Silva (Capgemini Engineering, Portugal); Pedro Escaleira (University of Aveiro & Instituto de Telecomunicações, Portugal); Ricardo Rodriguez (Instituto de Telecomunicações and Universidade de Aveiro, Portugal); João Almeida (Instituto de Telecomunicações - Universidade de Aveiro, Portugal); José Quevedo (University of Aveiro & Instituto de Telecomunicações, Portugal); Pedro Rito (Instituto de Telecomunicações, Universidade de Aveiro, Portugal); Bruno Parreira (NOS Technology, Portugal); Daniel Corujo (University of Aveiro & Instituto de Telecomunicações, Portugal); Joaquim Ferreira (University of Aveiro, Portugal); Marco Araujo (Capgemini Engineering, Portugal); Susana Sargento (Instituto de Telecomunicações, Universidade de Aveiro, Portugal)

Thursday, June 27 8:30 - 10:30

1T4: Sensors and Electronics

Room 4: Miragaia

Chair: Szymon Siecinski (University of Lübeck, Germany & Academy of Silesia, Poland)

8:30 ***Open Skywater130nm PDK-Based IP Development Platform: A PWM Peripheral Case Study***
Paul-Catalin Medinceanu and Marius Enachescu (UNSTPB, Romania)

8:45 ***LED-PUF: Physical Unclonable LED Signatures for Unique Identification of IoT Nodes***
Shab Naz, Ayesha Daniya Mulla and Sumayya H (India); Rifah Sameen Sarang (VTU Belgaum & Internship at IIIT Bangalore, India); Kurian Polachan (IIIT-Bangalore, India)

9:00 ***Estimation of Indoor Occupancy Level Based on Machine Learning and Multimodal Environmental Data***
Szymon Siecinski (University of Lübeck, Germany & Academy of Silesia, Poland & Silesian University of Technology, Poland); Esfandiar Mohammadi (University of Lübeck, Germany); Marcin Grzegorzek (University of Lübeck, Germany & DFKI, Germany & Fraunhofer IMTE, Germany & University of Economics in Katowice, Poland)

9:15 ***Towards Lightweight Fire Detection at the Extreme Edge Based on Decision Trees***
João Carlos N Bittencourt (University of Porto, Portugal & Federal University of Recôncavo Da Bahia, Brazil); Daniel G. Costa, Paulo Portugal and Francisco Vasques (University of Porto, Portugal)

9:30 *Fluxgate Sensor for Power Transformer Monitoring*

Alexander Fröhlich (Graz University of Technology, Austria); Dennis Albert (OMICRON, Austria); Philipp Schachinger (Austrian Power Grid AG, Austria); Herwig Renner (Graz University of Technology, Austria); Hans-Joachim Pöss (Dovitech GmbH, Germany)

9:45 *Potentionstat Network for Precision Agriculture*

Daniel Dias (ISCTE, Portugal); Octavian Postolache (Instituto Universitario de Lisboa and Instituto de Telecomunicacoes, Portugal); João Pedro Duarte Monge (ISCTE-IUL, Portugal)

Thursday, June 27 8:30 - 10:30

1T5: Sensing and Communications

Room 5: Arrábida

Chair: Alexandre Gouveia (Instituto Politécnico Do Porto, Portugal)

8:30 *Towards a Software-Based Approach to Smart Railway Maintenance*

João Tiago Fernandes, Marilia Curado and Fernando Boavida (University of Coimbra, Portugal)

8:45 *Detecting Litter From Aerial Imagery Using the SODA Dataset*

Daniel Pisani and Dylan Seychell (University of Malta, Malta)

9:00 *Experimental Evaluation of Commercial Powerline Communication System for Monitoring of Sensors in Industrial Processes*

Murilo Oliveira Leme (Federal University of Technology, Brazil); Sergio Luiz Stevan Junior (Universidade Tecnológica Federal do Paraná, Brazil)

9:15 *Privacy-Preserving Defense: Intrusion Detection in IoT Using Federated Learning*

Leonardo Almeida (Instituto de Telecomunicações, Portugal); Pedro Rodrigues (Instituto de Telecomunicacoes, Portugal); Rafael Gonçalves Teixeira (University of Aveiro & Instituto de Telecomunicações, Portugal); Mário Antunes (University of Aveiro, Portugal & Instituto de Telecomunicacoes, Portugal); Rui L Aguiar (University of Aveiro & Instituto de Telecomunicações, Portugal)

9:30 *Aquacom: A Multimodal Underwater Wireless Communications Manager for Enhanced Performance*

Guilherme Moreira (INESC TEC, Portugal); João Pedro Loureiro (University of Porto & INESC TEC, Portugal); Filipe Borges Teixeira (INESC TEC and Faculdade de Engenharia, Universidade Do Porto, Portugal); Rui Campos (INESC TEC and Faculty of Engineering, University of Porto, Portugal)

Thursday, June 27 9:30 - 10:30

Keynote 3: Digital Biomarkers for Precision Medicine Interventions by Paolo Bonato, Harvard Medical School, United States

Room 1: D. Maria

Paolo Bonato, Ph.D., serves as Director of the Motion Analysis Laboratory at Spaulding Rehabilitation Hospital, Boston MA. He is an Associate Professor in the Department of Physical Medicine and Rehabilitation at Harvard Medical School. He holds Adjunct Faculty appointments at Massachusetts Institute of Technology, the MGH Institute of Health Professions, and Boston University College of Health & Rehabilitation Sciences. He has held Adjunct Faculty positions at the Wyss Institute at Harvard University, Northeastern University, University of Ireland Galway, and University of Melbourne. His research work is focused on the development of rehabilitation technologies with special emphasis on wearable technology and robotics. Dr. Bonato served as Founding Editor-in-Chief of Journal on NeuroEngineering and Rehabilitation. He serves as a Member of the Advisory Board of the IEEE Journal of Biomedical and Health Informatics and as Associate Editor of the IEEE Journal of Translational Engineering in Health and Medicine. Also, he serves as Founding Editor-in-Chief of IEEE Open Journal of Engineering in Medicine and Biology. Dr. Bonato served as an Elected Member of the IEEE Engineering in Medicine and Biology Society (EMBS) AdCom (2007-2010) and as IEEE EMBS Vice President for Publications (2013-2016). He served as President of the International Society of Electrophysiology and Kinesiology (2008-2010). He received the M.S. degree in electrical engineering from Politecnico di Torino, Turin, Italy in 1989 and the Ph.D. degree in biomedical engineering from Universita` di Roma "La Sapienza" in 1995.

Thursday, June 27 9:30 - 10:30

Keynote 4: Battery Storage - Hopes and Limits by Vladimiro Miranda, University of Porto, Portugal

Room 2: D. Luís

Vladimiro Miranda is an IEEE Fellow since 2006 and recipient of the IEEE PES Ramakumar Family Renewable Energy Excellence Award 2014. He is Professor Emeritus of the University of Porto. He is President of INESC P&D Brasil, Brazil, and Associate Director of INESC TEC, Portugal. He is also Scientific Advisor for several institutions in Morocco, Spain, Argentina, Portugal, and is Advisor to the Regulatory Authority of Mozambique ARENE. He also served as President or as Advisor to institutions in China (Hong Kong and Macau). Responsible for many projects in Europe, the USA, Brazil, and China (Macau), he served in the Board of start-up companies generated by INESC TEC. His main interest domain has been the application of computational intelligence to power systems, his innovative solutions have been incorporated in industrial products in use in several continents. He is a top-publishing author, ranked among the 1% most cited in his area.

Thursday, June 27 11:00 - 12:30

2T1: Special Session: Demand response techniques in Renewable Energy Communities (RECs) and smart grids: modelling and applications in a highly EV mobility penetrated scenarios

Room 1: D. Maria

Chair: Elisa Belloni (University of Perugia, Italy)

11:00 ***A Solar-Powered Electric Quadricycle: Design, Preliminary Measurements, and Modelling of the PV Panels Behavior***

Elisa Belloni (University of Perugia, Italy); Vittorio Bertolini (Università degli Studi di Perugia, Italy);

Ermanno Cardelli and Antonio Faba (University of Perugia, Italy)

11:15 ***Optimal Charging of Electric Vehicles in Incentive-Based Energy Communities***
Giovanni Gino Zanvettor (University of Siena, Italy); Marco Casini (Universita' di Siena, Italy); Antonio Giannitrapani (Università di Siena, Italy); Simone Paoletti (Universita' di Siena, Italy); Antonio Vicino (Università degli Studi di Siena, Italy)

11:30 ***Application of Control Algorithms for Battery Scheduling in Grid-Connected Energy Prosumers***
Lorenzo Becchi, Marco Bindi, Matteo Intravaia and Francesco Grasso (University of Florence, Italy); Mattia Pasqui (Università degli Studi di Firenze, Italy); Carlo Carcasci (Carcacasci, Italy)

11:45 ***Electric Mobility Integrated in Renewable Energy Communities: Technical/Economic Modelling and Performance Analysis***
Elisa Belloni (University of Perugia, Italy); Davide Fioriti and Davide Poli (University of Pisa, Italy); Andrea Tumiati (University of Perugia, Italy)

12:00 ***Modelling of PV Systems for Preliminary Technical Analysis of PV Power Plants on Agricultural Land Sites***
Lorenzo Sabino (Università Degli Studi Roma Tre, Italy); Francesco Riganti Fulginei (Roma TRE University, Italy); Fabio Crescimbini (Università ROMA TRE, Italy); George CristianLazariou (Politehnica Bucharest, Romania)

12:15 ***EV Charging and PV Self-Consumption: Technical and Economic Analysis About Their Integration***
Alicia Triviño (University of Malaga, Spain); Fco. Paz and Inmaculada Casaucao (University of Málaga, Spain); Eliseo Villagrasa (Universidad de Málaga, Spain); Juan Quiros (University of Malaga, Spain)

Thursday, June 27 11:00 - 12:30

2T2: Special Session: Advanced Energy and Power Technologies for Future Power and E-mobility Systems

Room 2: D. Luís

Chairs: João Fernandes (Instituto Superior Técnico, University of Lisbon, Portugal), Vitor Monteiro (University of Minho, Portugal)

11:00 ***V/F Control Speed of IM Based on Second-Life of UPSs for E-Tuk-Tuk***
Bun Menghorng, Bunthern Kim and Phok Chrin (Institute of Technology of Cambodia, Cambodia); Pascal Maussion (Laplace, France)

11:15 ***Extended-Range Marine Unmanned Surface Vehicles for Border Surveillance Missions***
João Fernandes (Instituto Superior Técnico, University of Lisbon, Portugal); Mário Assunção (Escola Superior Náutica Infante D. Henrique, Portugal); Daniel Serrano and Pedro Afonso (Instituto Superior Técnico, Portugal); Pedro Pinheiro and Hugo Marques (Escola Superior Náutica Infante D. Henrique, Portugal); José Neves (Instituto Superior Técnico, Portugal); Pedro Teodoro and Ricardo Póvoa (Escola Superior Náutica Infante D. Henrique, Portugal); Rosa Marat-Mendes (IDMEC Escola Superior Náutica Infante D. Henrique, Portugal); Paulo J Costa Branco (Professsor & Instituto Superior Técnico, Portugal)

11:30 ***Behavioral Pattern of Brushless Flux Switching Wound Field Machine: A Focus on Static Rotor Eccentricity***

Chiweta Emmanuel Abunike (Michael Okpara University of Agriculture, Umudike Abia State, Nigeria); Ogbonnaya Inya Okoro (Michael Okpara University of Agriculture Umudike Abia State Nigeria, United Kingdom (Great Britain)); Aliakbar Jamshidi Far and Sumeet Aphale (University of Aberdeen, United Kingdom (Great Britain))

11:45 ***A Comprehensive Market Mechanism for Decentralized P2P Energy Trading Platform***

Younes Zahraoui, Tarmo Korõtko and Hannes Agabus (Tallinn University of Technology, Estonia); Argo Rosin (FinEst Centre for Smart Cities Tallinn University of Technology, Estonia)

12:00 ***Performance Comparison of Wide Band Gap Semiconductors Based Multilevel Converters for Grid Application***

José Manuel Damil Vicente, Pedro Guilherme Silva Cristóvão, Agostinho Afonso da Rocha and Carlos João Rodrigues Costa Ramos (University of Porto, Portugal); Vitor Morais (Nomad Tech, Portugal)

12:15 ***DQ Predictive Based Current Control of a Three-Phase NPC Converter***

Vitor Monteiro (University of Minho, Portugal); Sergio Coelho (University of Minho, Canada); João Afonso (UMINHO, Brazil)

Thursday, June 27 11:00 - 12:30

2T3: Special Session: Sustainable and Smart: Future Trend

Room 3: S. João

Chair: Michela Longo (Politecnico di Milano, Italy)

11:00 ***Bifacial Photovoltaics for Agricultural Vehicles: A Comparative Energy Analysis***

Domenico Mazzeo, Nicoletta Matera, Michael Wood, Emanuele Ogliari and Sonia Leva (Politecnico di Milano, Italy)

11:15 ***Photovoltaic Performance Assessment in Different Weather Conditions Utilizing an Artificial Neural Network Ensemble***

Nicoletta Matera, Michela Longo, Sonia Leva and Dario Zaninelli (Politecnico di Milano, Italy)

11:30 ***Deterministic Algorithm for Optimizing Energy Storage Systems Along Railway Lines***

Alessandro Ruvio (University of Rome La Sapienza, Italy)

11:45 ***Electromagnetic Modelling of Resistance Spot Welding System***

Aldo Canova (Politecnico di Torino, Italy); Maja Grbic (Nikola Tesla Institute of Electrical Engineering University of Belgrade, Serbia); Michele Quercio (Università Degli Studi Roma Tre, Italy)

12:00 ***Ascending Load Order Method for Capacity Credit Estimation for Renewable Energy Projects***

Arif S Malik and Majid Al Umairi (Sultan Qaboos University, Oman)

12:15 ***Tiny Machine Learning for Li-Ion Battery State of Health Estimation***

Spyridon Giazitzis, Maciej Sakwa and Emanuele Ogliari (Politecnico di Milano, Italy); Susheel Badha and

Filippo Rosetti (Infineon Technologies, Austria)

Thursday, June 27 11:00 - 12:30

2T4: Special Session: Advances in the internet of medical things

Room 4: Miragaia

Chairs: Maria de Fatima Domingues (Khalifa University & Instituto de Telecomunicações and University of Aveiro, United Arab Emirates), Leontios Hadjileontiadis (Khalifa University of Science and Technology, United Arab Emirates)

11:00 ***Unraveling Emotional Dynamics in Conversations With Swarm Decomposition, Affect Dynamics, and Machine Learning***

Ghada Alhussein (Khalifa University, United Arab Emirates); Shiza Saleem and Leontios Hadjileontiadis (Khalifa University of Science and Technology, United Arab Emirates)

11:15 ***PulsECG - A Cuffless Non-Invasive Blood Pressure Monitoring Device Through Neural Network Analysis of ECG and PPG Signals***

Vincenzo Randazzo, Pietro Buccellato, Jacopo Ferretti and Federico Delrio (Politecnico di Torino, Italy); Eros GA Pasero (Politecnico of Turin, Italy & Neuronica Lab, Italy)

11:30 ***"The Kite" Breathing Serious Game: Agile Co-Design for Psoriatic Arthritis***

Bárbara Ramalho (Universidade de Motricidade Humana, Portugal); Marta Vicente and Hugo Escobar (Faculdade de Motricidade Humana, Portugal); Sandra Gama (Instituto Superior Técnico, Portugal); Filomena Carnide, Fátima Baptista and José A. Diniz (Faculdade de Motricidade Humana, Portugal); Leontios Hadjileontiadis (Khalifa University of Science and Technology, United Arab Emirates); Sofia B. Dias (Faculdade de Motricidade Humana, Portugal)

11:45 ***Beyond the Game: Multimodal Game-Experience Recognition During Dynamic Affective Game Environments***

Efstratia Ganiti-Roumeliotou (Khalifa University of Science, Research and Technology, United Arab Emirates); Sofia B. Dias (Faculdade de Motricidade Humana, Portugal); Kinda Khalaf (Khalifa University, United Arab Emirates); Herbert F Jelinek (Healthcare Engineering Innovation Center, Khalifa University & Charles Sturt University, United Arab Emirates); Leontios Hadjileontiadis (Khalifa University of Science and Technology, United Arab Emirates)

12:00 ***Beyond Surgery: Using the Analgesia Nociception Index for Postoperative Pain Prediction***

Miguel Silva (University of Aveiro, Portugal); Raquel Sebastião (IEETA, University of Aveiro, Portugal)

Thursday, June 27 11:00 - 12:30

2T5: Special Session: Utility Scale and Distributed Storage for Sustainable and Efficient Power and Energy Systems

Room 5: Arrábida

Chairs: Luis Gomes (Polytechnic of Porto (GECAD), Portugal), Pedro Salomé (Universidade de Aveiro, Portugal)

11:00 ***Comparison of Retraining Schedules in Ensemble Models for Enhanced Day-Ahead Electricity Net-Demand Predictions***

Alexander Micallef, Maurice Apap and John Licari (University of Malta, Malta)

11:15 ***Energy Management Framework for Transactive Energy Communities***

Nuno Mendes (Institute of Systems and Robotics & University of Coimbra, Portugal); Jérôme Mendes (University of Coimbra, Portugal); Nuno Goncalves (University of Coimbra - Institute of Systems and Robotics, Portugal); Pedro Moura (University of Coimbra, Portugal)

11:30 ***Battery Reuse and Lithium Exploration: A Business Model Analysis for the Portuguese Scenario***

Débora Regina São José (ISEP - GECAD, Portugal); Pedro Faria and Zita Vale (Polytechnic Institute of Porto, Portugal)

11:45 ***Enhancing Energy Systems Efficiency Through Virtual Power Plants: Considerations for the Portuguese Case***

Vitor Lopes (International Iberian Nanotechnology Laboratory (INL), Portugal); João Alves and Jennifer Teixeira (International Iberian Nanotechnology Laboratory, Portugal); Ricardo Faia (Polytechnic Institute of Porto, Portugal); Luis Gomes (Polytechnic of Porto (GECAD), Portugal); Zita Vale (Polytechnic Institute of Porto, Portugal); Mauro Costa and Ana Luisa Pereira (Dst Solar, Portugal); Pedro Salomé (International Iberian Nanotechnology Laboratory)

Thursday, June 27 14:00 - 16:00

3T1: Telemedicine and E-health

Room 1: D. Maria

Chair: Omar Al Hashimi (University of West London, United Kingdom (Great Britain))

14:00 ***AquaFlux New Designs in Virtual Environment***

Omar Al Hashimi (University of West London, United Kingdom (Great Britain))

14:15 ***PPG-Based Real-Time Blood Pressure Monitoring Using Reflective Pulse Transit Time: Rest vs. Exercise Evaluation***

Rojan Aslani (Institute for Systems and Computer Engineering, Technology and Science, Portugal); Duarte Dias (INESC TEC, Portugal); João Paulo S. Cunha (INESC TEC and FEUP, Portugal)

14:30 ***Signal Statistics of Heart Sound Recordings: A Comparative Study Between Smartphones and Electronic Stethoscopes***

Xinqi Bao, Pablo Lamata and Ernest Kamavuako (King's College London, United Kingdom (Great Britain))

14:45 ***Decoding Anxiety Through Your Fingertips Using Mobile Photoplethysmography***

Ana Carolina Almeida (Universidade de Aveiro, Portugal); Francisca Canais, Rita Maçorano and Manuel Lopes (Nevaro Tech, Portugal); Hugo Ferreira (Faculty of Sciences of the University of Lisbon, Portugal); Susana Brás (Universidade de Aveiro, Portugal)

15:00 ***Streamlining the Generation of AI Tools on a Cloud Medical Imaging Platform***
Rui Jesus and Ana Rodrigues (University of Aveiro, Portugal); Luís Bastião Silva (BMD Software, Portugal); Carlos Costa (University of Aveiro, Portugal)

15:15 ***Indoor Air Quality Monitoring Systems for Sustainable Medical Rooms and Enhanced Life Quality***
Samah Mohamed (Nile University, Egypt); Yomna Gamal (Nanoelectronics Integrated Systems Center, Egypt); Ahmed Soltan and Lobna Said (Nile University, Egypt)

15:30 ***TENSmini: A Wearable Electrical Nerve Stimulator for Urinary Incontinence Management***
Wei Ju (The University of Edinburgh, United Kingdom (Great Britain)); Sadeque Reza Khan (Heriot-Watt University, United Kingdom (Great Britain)); Kianoush Nazarpour and Srinjoy Mitra (University of Edinburgh, United Kingdom (Great Britain))

15:45 ***Evaluating Visual Explainability in Chest X-Ray Pathology Detection***
Pedro Pereira (INESC TEC and FEUP, Porto, Portugal); Joana Rocha (University of Porto & INESC-TEC, Portugal); João Pedrosa (INESC TEC and FEUP, Porto, Portugal); Ana Maria Mendonça (University of Porto, Portugal & INESC TEC, Portugal)

Thursday, June 27 14:00 - 16:00

3T2: Digital Transformation I

Room 2: D. Luís

Chair: Rogerio Dionisio (Instituto Politecnico de Castelo Branco & CISeD- Research Center in Digital Services, Portugal)

14:00 ***Integrating Artificial Intelligence With Salesforce: A Literature Review***
Andjela Todoric and Teodora Vuckovic (University of Novi Sad, Serbia); Rogerio Dionisio (Instituto Politecnico de Castelo Branco & CISeD- Research Center in Digital Services, Portugal); Dusanka Dakic and Darko Stefanovic (University of Novi Sad, Serbia)

14:15 ***An Integrated Survey for Cultural Heritage Mapping: The Spanish Fortress (Italy) Case-Study***
Simona Verde and Gianfranco Fornaro (CNR-IREA, Italy); Luca Martelli, Fabio Lanfranchi and Laura Carnevali (Sapienza University of Rome, Italy)

14:30 ***Towards Building a Smart Water Management System (SWAMS) in Nigeria***
Oluwaseun Bamgboye, Christos Chrysoulas and Xiaodong Liu (Edinburgh Napier University, United Kingdom (Great Britain)); Tess Watt (Edinburgh Napier Univesrity, United Kingdom (Great Britain)); Adesina Sodiya (Federal University of Agriculture, Abeokuta, Nigeria); Mathew Oyeleye (University of Huddersfield, United Kingdom (Great Britain)); Sampath Kalutharage (Edinburgh Napier University, United Kingdom (Great Britain))

14:45 ***Digital Twin-Based Assessment Framework for Monitoring Visual Comfort***
Marina Bonomolo (University of Palermo, Italy); Tancredi Testasecca (Università Degli Studi di Palermo, Italy); Filippo Luca Alberto Munafò, Alessandro Buscemi and Marco Beccali (University of Palermo, Italy)

15:00 ***Navigating the Future of Enterprises: Insights Into Digital Transformation, Virtual Reality, and***

the Metaverse

Rogério Silva (ISRC ISEP IPP, Portugal); Ivo Pereira (UFP - University Fernando Pessoa, Portugal); Susana Nicola (INESC TEC ISRC ISEP IPP, Portugal); Ana Maria Madureira (Institute of Engineering-Polytechnic Institute of Porto, European Union); Nuno Bettencourt (Polytechnic Institute of Porto & INESC TEC, ISRC, ISEP, IPP, Portugal); José Luís Reis and José Paulo Santos (University of Maia, Portugal); Daniel Alves de Oliveira (E-Goi, Portugal)

15:15 ***Training Needs Assessment for the Design of Health Care Digital Transformation Courses in EU***

Mélanie Raimundo Maia (UNIDEMI, NOVA SST, Universidade Nova de Lisboa, Portugal); Marília Silva Paulo (CHRC, NOVA NMS, Universidade Nova de Lisboa, Portugal); Nuno Bettencourt (Polytechnic Institute of Porto & INESC TEC, ISRC, ISEP, IPP, Portugal); Susana Nicola (INESC TEC ISRC ISEP IPP, Portugal); Ana Maria Madureira (Institute of Engineering-Polytechnic Institute of Porto, European Union); Sharona Vonck (PXL Healthcare, CEIC, PXL University of Applied Sciences and Arts, Belgium); Luís Velez Lapão (UNIDEMI, NOVA SST, Universidade Nova de Lisboa, Portugal)

15:30 ***A Roadmap for Education and Retraining in Low-Carbon Technologies***

Ali Ehsan (The University of Manchester, United Kingdom (Great Britain)); Anna Bond (Anna Bond Manchester Climate Agency Ltd., United Kingdom (Great Britain)); Stella Hadjistassou (University of Cyprus, Cyprus); Mihailo Micev (University of Montenegro, Montenegro); Austeja Mockeviciute-Azzopardi and Brian Azzopardi (Foundation for Innovation and Research Malta, Malta); Eduardo Martínez Ceseña (The University of Manchester, United Kingdom (Great Britain)); Jovica Milanovic (UoM, United Kingdom (Great Britain))

15:45 ***Enhancing Education in Multi-Energy Systems With Data Science Notebooks***

Ali Ehsan (The University of Manchester, United Kingdom (Great Britain)); Tomislav Baskarad (University of Zagreb, Croatia); Brian Azzopardi (Foundation for Innovation and Research Malta, Malta); Eduardo Martínez Ceseña (The University of Manchester, United Kingdom (Great Britain)); Jovica Milanovic (UoM, United Kingdom (Great Britain))

Thursday, June 27 14:00 - 16:00

3T3: Conversion and Control of Sustainable Energy Sources

Room 3: S. João

Chair: Vitor Monteiro (University of Minho, Portugal)

14:00 ***Framework for Training and Deployment Machine Learning Methods in Real-Time Simulator: Short-Term Kinetic Energy Forecasting in Power Systems***

Jose Miguel Riquelme-Dominguez (University of Seville, Spain); Francisco Gonzalez-Longatt (University of South-Eastern Norway & Venezuelan Wind Energy Association, Norway); Jose Martin Valles (Universidad Nacional Autónoma de México, Mexico); Jose Rueda Torres (Delft University of Technology, The Netherlands)

14:15 ***Grid-Following Virtual Synchronous Machines: A Valid Solution Fulfilling the Newest Grid Codes Regarding the Reactive Grid Support During Faults***

Vincenzo Mallemaci, Fabio Mandrile, Alessia Camboni, Enrico Carpaneto and Radu Bojoi (Politecnico di

Torino, Italy)

14:30 ***Novel Adaptive Protection Approach for Optimal Coordination of Directional Overcurrent Relays***
Cleberton Reiz (INESC TEC, Brazil & São Paulo State University (UNESP), Brazil); Everton Leandro Alves and André Melim (INESC TEC, Portugal); Clara Gouveia (INESC TEC Porto, Portugal); António Carrapatoso (INESC TEC, Portugal)

14:45 ***The Wide-Synchronization Control at Support of the Oscillatory Stability of Power Systems***
Salvatore Favuzza, Mariano Ippolito and Fabio Massaro (Università di Palermo, Italy); Rossano Musca (University of Palermo, Italy)

15:00 ***Bandwidth and Current Limiting PLL Design for Grid-Connected VSCs***
Zaint Alexakis, Panos Papageorgiou and Antonio T Alexandridis (University of Patras, Greece)

15:15 ***Dual Active Bridge Converter Operation at Optimal Dual Phase Shift Modulation***
Abel António Ferreira (Instituto Superior de Engenharia Do Porto (ISEP), Instituto Politécnico Do Porto & Vestas Technology Centre Porto, Portugal); José Antunes (Instituto Superior Engenharia Porto, Portugal); Rui Chibante (Instituto Superior de Engenharia Do Porto (ISEP), Instituto Politécnico Do Porto & SYSTEC - Centro de Sistemas e Tecnologias, Portugal); Catalin Gabriel Dincan (Vestas Wind Systems, Portugal)

15:30 ***Virtual Inertia-Based Control Strategy for Stable Operation of a Weak Grid Using Modular Multilevel Converter***
Saeed Hosseinnataj (Noshirvani University of Technology Babol, Iran); Majid Mehrasa (San Diego State University, USA); Mohammad Rezanejad (University of Mazandaran Babolsar, Iran); Eduardo MG M. G. Rodrigues and Rui Melicio (Instituto Superior Técnico, Portugal)

Thursday, June 27 14:00 - 16:00

3T4: E-Health II

Room 4: Miragaia

Chair: Maria de Fatima Domingues (Khalifa University & Instituto de Telecomunicações and University of Aveiro, United Arab Emirates)

14:00 ***Weighted Average Confidence Score-Based Ensemble Classification to Mitigate the Effect of Time on Myoelectric Control***
Bingbin Wang and Ernest Kamavuako (King's College London, United Kingdom (Great Britain))

14:15 ***Brain Anterior Nucleus of the Thalamus Signal as a Biomarker of Upper Voluntary Repetitive Movements in Epilepsy Patients***
Elodie Múrias Lopes and Madalena Pimentel (INESC TEC & FEUP, Portugal); Tamás Karácsony (INESC TEC and FEUP, Portugal); Ricardo Rego (Centro Hospitalar Universitário São João, Portugal); João Paulo S. Cunha (INESC TEC and FEUP, Portugal)

14:30 ***Modelling the Consent Acquisition Time in Organ Donor Management Through Clustering and Mixture Probability Models***
Maurizio Naldi (LUMSA University, Italy); Arianna Freda (Roma Tre University, Italy); Gaia Nicosia

(Università Roma Tre, Italy); Andrea Pacifici (Università di Roma "Tor Vergata", Italy); Gianfranco Teti and Mariano Feccia (San Camillo-Forlanini Hospital, Italy)

14:45 ***Evaluation of Spectral Exponent Estimation Methods for Electroencephalographic Signal***
Stefania Coelli, Gabriella Monopoli and Anna M. Bianchi (Politecnico di Milano, Italy)

15:00 ***Effects of Action Observation Training on Brain Network Efficency During Motor Tasks***
Martina Corda, Alessandra Calcagno and Stefania Coelli (Politecnico di Milano, Italy); Federico Temporiti and Roberto Gatti (Humanitas Clinical and Research Center - IRCCS, Italy); Manuela Galli and Anna M. Bianchi (Politecnico di Milano, Italy)

15:15 ***Challenges in Federated Learning Trained Anomaly Detection Applied to Hospital Data Without a Baseline***
Susana Polido (Iscte Instituto Universitário de Lisboa, Portugal); Otavio Napoli (Institute of Computing UNICAMP, Brazil); Maurício Breternitz Jr. (Instituto Universitário de Lisboa ISCTE-IUL ISTAR, Portugal); Ana Maria de Almeida (ISCTE-IUL & ISTAR-IUL/ CISUC, Portugal)

Thursday, June 27 14:00 - 16:00

3T5: Electrical Machines and Drives

Room 5: Arrábida
Chair: Paulo G. Pereirinha (Portugal)

14:00 ***Slotless Induction Synchronous Permanent Magnet Motor Application in Electric Vehicles***
Armands Sīlītis (Riga Technical University & Cesu Study and Science Center, Latvia); Leonids Ribickis (Riga Technical University, Latvia)

14:15 ***Design of High-Reliability LDO Regulator Combined With LVTSCR-Based ESD Protection Circuit Using Current Feedback Structure***
U Yeol Seo (University of Dankook, Korea (South)); Sang Wook Kwon and Byung Seok Lee (Dankook University, Korea (South)); Yongseo Koo (University of Dankook, Korea (South))

14:30 ***A Comprehensive Voltage-Behind-Reactance Model of Twelve-Phase Synchronous Motors***
Luisa Tolosano, Sandro Rubino and Radu Bojoi (Politecnico di Torino, Italy)

14:45 ***Fault-Tolerant Multilevel T-Type Nine-Switch Inverter With Standby Redundant Devices Applied to a Six-Phase IM***
Armando Cordeiro (ISEL-Instituto Superior de Engenharia de Lisboa, Portugal); Vitor Fernao Pires (ESetubal/IPS, Portugal); Ricardo Luis (Instituto Superior de Engenharia de Lisboa - Instituto Politecnico de Lisboa, Portugal); Pedro Fonte (ISEL-Instituto Superior de Engenharia de Lisboa, Portugal)

15:00 ***Improving Torque Characteristics in Induction Machines: A Finite Element Method Approach for Converting From 3-Phase to 6-Phase Operation***
Daniel Baptista Ferreira (ISEL - Instituto Superior de Engenharia de Lisboa, IPL, Portugal); José Marcos (Instituto Superior de Engenharia de Lisboa (ISEL), Portugal); Jose Quadrado (Instituto Superior de Engenharia de Lisboa, Portugal)

15:15 ***Harmonic Current Analysis for a Five-Phase Harmonic-Excited Synchronous Machine***

Sukanya Kamboj (University of Bundeswehr, Munich, Germany); Dieter Gerling (University of Federal Defence Munich, Germany)

15:30 ***Enhancing Electric Vehicle Diagnostics Through Constant Speed Subrange Detection for Noise-Reduced Analysis***

Hicham El hadraoui (UM6P, Morocco); Nasr Guennouni (Mohammed VI Polytechnic University, Morocco); Adila El Maghraoui (UM6P, Morocco); Nabil Elbazi (University Sultan Moulay Slimane, Morocco & Mohammed VI Polytechnique University, Morocco); Mourad Zegrari (Université Hassan II Casablanca, Morocco); Ahmed Chebak (Mohammed VI Polytechnic University (UM6P), Morocco)

Thursday, June 27 16:30 - 18:00

4T1: Cybersecurity

Room 1: D. Maria

Chair: Pedro Pinto (Instituto Politécnico de Viana Do Castelo & INESC TEC, Portugal)

16:30 ***Intrusion Detection System for Multiclass Detection Based on a Convolutional Neural Network***

Marija Milosevic, Vladimir M. Ciric and Ivan Milentijevic (University of Nis, Faculty of Electronic Engineering, Serbia)

16:45 ***Autoencoder-Based Network Intrusion Detection on Multiple Datasets***

Vladimir M. Ciric (University of Nis, Faculty of Electronic Engineering, Serbia); Aleksa Milojkovic and Marija Milosevic (University of Nis, Serbia)

17:00 ***A Prototype for Generating Random Key Sounds to Prevent Keyboard Acoustic Side-Channel Attacks***

Diogo Rodrigues and Gonçalo Macedo (Instituto Politécnico de Viana do Castelo, Portugal); Mauro Conti (University of Padova, Italy); Pedro Pinto (Instituto Politécnico de Viana Do Castelo & INESC TEC, Portugal)

Thursday, June 27 16:30 - 18:00

4T2: Energy Management II

Room 2: D. Luís

Chair: Gianfranco Chicco (Politecnico di Torino, Italy)

16:30 ***Invisible Windows for Measurement of Harmonic Components***

Gerd Bumiller (Hochschule Ruhr West & University of Applied Sciences, Germany)

16:45 ***Improving Protection Reliability of Multi-Source Meshed Power Systems by an Automation-Assisted Overcurrent Protection***

Hossein Ebrahimi (Aalto University, Finland & Urmia University, Iran); Amin Yazdaninejadi (Shahid

Rajaee Teacher Training University, Iran); Sajjad Golshannavaz (University of Tehran & College of Engineering, Iran); Edris Pouresmaeil (Aalto University, Finland)

17:00 ***Green Ports - Shore Power Supply State of the Art***
Pedro Costa Costa (Coimbra Polytechnic Portugal, Portugal); Cristina I. Faustino Agreira (Coimbra Polytechnic, Portugal); Rui Pestana (REN - Rede Eléctrica Nacional, S.A., Portugal); Yao Cao (RD Nester, Portugal)

17:15 ***Investigation on the Impact of Heat Waves on Distribution System Failures***
Andrea Mazza and Gianfranco Chicco (Politecnico di Torino, Italy); Carmen Lucia Tancredo Borges (Federal University of Rio de Janeiro, Brazil)

Thursday, June 27 16:30 - 18:00

4T3: Digital Transformation II

Room 3: S. João
Chair: Paulo Menezes (Universidade de Coimbra, Portugal)

16:30 ***Predictive Analytics for Customer Behavior - Top Up Propensity and Account Balance Predictions in Prepaid Mobile Services***
Beatriz Mesquita (University of Aveiro, Portugal); Bernardo Duarte and Francisco Silva (Altice Labs, Portugal); Petia Georgieva (University of Aveiro, DETI/IEETA & Institute of Electronics Engineering and Telematics of Aveiro (IEETA), Portugal)

16:45 ***Optimizing Microservices Placement in the Cloud-To-Edge Continuum: A Comparative Analysis of App and Service Based Approaches***
Miguel Mota-Cruz, João H Santos and José F Macedo (Centre for Informatics and Systems of the University of Coimbra, Portugal); Karima Velasquez (University of Coimbra, Portugal); David Perez Abreu (University of Coimbra, Portugal & Instituto Pedro Nunes, Portugal)

17:00 ***Optimization Strategies in SEI: An Analysis of SARIMA and Additive Holt-Winters Models***
Catarina Cristino (University of Porto, Portugal); Susana Nicola (INESC TEC ISRC ISEP IPP, Portugal); Joaquim Costa (University of Porto, Portugal); Nuno Bettencourt (Polytechnic Institute of Porto & INESC TEC, ISRC, ISEP, IPP, Portugal); Ana Maria Madureira (Institute of Engineering-Polytechnic Institute of Porto, European Union); Ivo Pereira (UFP - University Fernando Pessoa, Portugal); Alberto Costa (Liderteam, Portugal)

Thursday, June 27 16:30 - 18:00

4T4: Power, Energy, and Power Electronics

Room 4: Miragaia
Chair: Alberto Dolara (Politecnico di Milano, Italy)

16:30 ***Simulation and Experiment of a Boost Converter With Four-Layer Voltage Multipliers***
Wei-Cheng Lin, Mei-Yung Chen and Kai-Jun Pai (National Taiwan Normal University, Taiwan)

16:45 ***Exploring the Impact of Phase Configuration on the Operational Characteristics of Switched Reluctance Motors***
Chiweta Emmanuel Abunike (Michael Okpara University of Agriculture, Umudike Abia State, Nigeria); Joy Udolisa Jeff-Matthew and Chukwuemeka Awah (Michael Okpara University of Agriculture Umudike Abia State Nigeria, Nigeria); Ogbonnaya Inya Okoro, Ifeanyichi Ben Oruh and Aniagboso John Onah (Michael Okpara University of Agriculture Umudike Abia State Nigeria, United Kingdom (Great Britain))

17:00 ***A Comparative Study of Ladder Differential Power Processor and Bypass Diode Under Partial Shading Conditions***
Ana Cabrera-Tobar (Politecnico di MIlano, Italy); Alberto Dolara and Emanuele Ogliari (Politecnico di Milano, Italy)

17:15 ***An Ultra-Stable Custom Current Supply for Use in a Neutron Electric Dipole Moment Experiment***
Shomi Ahmed, Blair Jamieson, Jeffery W. Martin, David C. M. Ostapchuk and Mark McCrea (University of Winnipeg, Canada); Wolfgang Klassen (University of British Columbia, Canada)

Thursday, June 27 16:30 - 18:00

4T5: Learning and Control in Energy Systems

Room 5: Arrábida
Chair: Fabio Corti (University of Florence, Italy)

16:30 ***A Hybrid Data-Driven Approach in Magnetic Core Loss Modeling for Power Electronics Applications***
Luigi Solimene, Carlo Ragusa, Alessio Giuffrida, Nicolò Lombardo, Fabio Marmello, Simone Morra and Marco Pasquale (Politecnico di Torino, Italy)

16:45 ***Learning-Based State Estimation in Low Voltage Grids: A Performance Comparison***
Andrea Bragantini (Universitat Politecnica de Catalunya & CITCEA UPC, Spain); Eduard Crehuet Baraza (CITCEA UPC, Italy); Andreas Sumper (Universitat Politecnica de Catalunya (UPC), Spain)

17:00 ***Optimization of Charging Infrastructure for Electric Micromobility Vehicles in Touristic Areas***
Fabio Corti (University of Florence, Italy); Salvatore Dello Iacono (University of Brescia, Italy); Davide Astolfi (Università di Brescia, Italy); Marco Pasetti and Alessandra Flammini (University of Brescia, Italy); Gabriele Lozito and Alberto Reatti (University of Florence, Italy)

17:15 ***A Robust Control Design and Analysis for Modular Multilevel Converters Under Parameter Mismatch***
Reza Janbazi Ghadi (Babol Noshirvani University of Technology, Iran); Majid Mehrasa (San Diego State University, USA); Eduardo MG M. G. Rodrigues (Instituto Superior Técnico, Portugal)

17:30 ***A Computational Implementation to Forecast Electric Vehicles Usage in the Power System***
Herbert Amezquita (INESC ID, Portugal); Cindy P. Guzman and Hugo Morais (INESC-ID, Portugal)

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Technical Program Committee

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