2020 IEEE 20th Mediterranean Electrotechnical Conference (MELECON 2020)

Palermo, Italy
16 – 18 June 2020

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

CONFERENCE PROGRAM

TRACK 1 - SMART MOBILITY

Session 1.1: Electric vehicle transportation systems and their environmental impact, charging infrastructure and grid integration

Chairs: Rosa Mastromauro, *University of Firenze, Italy*
Elena Breaz, *UBTM, France*

1 **From electric mobility to hydrogen mobility: current state and possible future expansions**
Guido Ala, University of Palermo, Italy
Vincenzo Castiglia, University of Palermo, Italy
Gabriella Di Filippo, University of Palermo, Italy
Rosario Miceli, University of Palermo, Italy
Pietro Romano, University of Palermo, Italy
Fabio Viola, University of Palermo, Italy

7 **Acoustic Impact of Electric Vehicles**
Filippo Giammaria Praticò, University "Mediterranea", Italy
Paolo G. Briante, University "Mediterranea", Italy
Greta Speranza, University "Mediterranea", Italy

13 **Selective harmonic mitigation with asymmetrical staircase voltage waveform for a three-phase fivelevel Cascaded H-Bridge Inverter**
Giuseppe Schettino, University of Palermo, Italy
Nicola Campagna, University of Palermo, Italy
Ciro Spataro, University of Palermo, Italy
Antonino Oscar Di Tommaso, University of Palermo, Italy
Rosario Miceli, University of Palermo, Italy
Fabio Viola, University of Palermo, Italy

19 **Cost-benefit analysis for multiple agents considering an electric vehicle charging/discharging strategy and grid integration**
Mahsa Bagheri Tookanlou, Northumbria University, UK
Mousa Marzband, Northumbria University, UK
Ameena Al Sumaiti, Khalifa University, UAE
Andrea Mazza, Politecnico di Torino, Italy

25 **Modeling of Magnetorheological Fluids Relative Magnetic Permeability by using a Neural Network approach**
Paweł Kowol, Silesian University of Technology, Poland
Marcin Szczygieł, Silesian University of Technology, Poland
Grazia Lo Sciuto, University of Catania, Italy
Giacomo Capizzi, University of Catania, Italy

29 **Outlier Removal for Improving the Accuracy of Electric Vehicle Behavior Prediction**
Kunihiro Miyazaki, The University of Tokyo, Japan
Kenji Tanaka, The University of Tokyo, Japan

Session 1.2 - Part 1: Transportation electrification, electric & hybrid vehicle, interconnected cities

Chairs: Luca Pugi, *University of Firenze, Italy*
Cyril Spiteri Staines, *University of Malta, Malta*

35 **An analytical evaluation of rotor eccentricity effects on synchronous drives with surface mounted permanent magnet brushless motors**
Andrea Del Pizzo, University of Naples Federico II, Italy
Luigi Pio Di Noia, University of Naples Federico II, Italy
Emanuele Fedele, University of Naples Federico II, Italy

41 Performance Comparison of modified modulation Techniques for Quasi-Z-Source Converters
Giuseppe Schettino, University of Palermo, Italy
Nicola Campagna, University of Palermo, Italy
Antonino Oscar Di Tommaso, University of Palermo, Italy
Vincenzo Castiglia, University of Palermo, Italy
Rosario Miceli, University of Palermo, Italy
Fabio Viola, University of Palermo, Italy

46 Modelling, simulation and characterization of a supercapacitor
Vincenzo Castiglia, University of Palermo, Italy
Nicola Campagna, University of Palermo, Italy
Ciro Spataro, University of Palermo, Italy
Claudio Nevoloso, University of Palermo, Italy
Fabio Viola, University of Palermo, Italy
Rosario Miceli, University of Palermo, Italy

52 A prototypal PCB board for the EMI characterization of SiC-based innovative switching devices
Filippo Pellitteri, University of Palermo, Italy
Massimo Caruso, University of Palermo, Italy
Salvatore Stivala, University of Palermo, Italy
Antonino Parisi, University of Palermo, Italy
Vincenzo Vinciguerra, University of Palermo, Italy
Angelo Messina, University of Palermo, Italy
Guido Ala, University of Palermo, Italy
Fabio Viola, University of Palermo, Italy
Rosario Miceli, University of Palermo, Italy
Alessandro Busacca, University of Palermo, Italy

57 A Low Cost Programmable Hardware for Online Spectroscopy of Lithium Batteries
Tommaso Serni, University of Florence, Italy
Edoardo Locorotondo, University of Florence, Italy
Luca Pugi, University of Florence, Italy
Lorenzo Berzi, University of Florence, Italy
Marco Pierini, University of Florence, Italy
Vincenzo Cultrera, University of Florence, Italy

Session 1.2 - Part 2: Transportation electrification, electric & hybrid vehicle, interconnected cities

Chairs: Luca Pugi, *University of Firenze, Italy*
Cyril Spiteri Staines, *University of Malta, Malta*

63 Design and Testing of a Flash Recharge System for a Bus including foreseen effects in terms of Storage Life Extension
Adriano Alessandrini, University of Florence, Italy
Riccardo Barbieri, University of Florence, Italy
Lorenzo Berzi, University of Florence, Italy
Luca Pugi, University of Florence, Italy
Marco Pierini, University of Florence, Italy
Fabio Cignini, Centro Ricerche Casaccia ENEA, Italy
Antonino Genovese, Centro Ricerche Casaccia ENEA, Italy
Fernando Ortenzi, Centro Ricerche Casaccia ENEA, Italy
Edoardo Locorotondo, University of Florence, Italy

69 Motion Control in Resonant Frequency for an Electrified Implement
Ilja Stasewitsch, Technische Universitat Braunschweig, Germany
Michaela Pußack, Technische Universitat Braunschweig, Germany
Jan Schattenberg, Technische Universitat Braunschweig, Germany
Ludger Frerichs, Technische Universitat Braunschweig, Germany

---

Session 1.3: *Smart mobility of people and goods*

Chairs: Carlo Cecati, *University of L'Aquila, Italy*
Giuseppe Tomasso, *University of Cassino, Italy*

Session 1.4: *Air transportation, avionics and aerospace, more electric aircrafts*

Chairs: Antonio Faba, *University of Perugia, Italy*
Armin Dietz, *University of Nurberg, Germany*

TRACK 2 - INDUSTRY 4.0

Session 2.1: Industrial applications

Chairs: Luis Almeida, *University of Porto, Portugal*
       Alessandro Papadopoulos, *Mälardalen University, Sweden*

159 **Leak Detection Algorithm for Pipelines in Noisy Environments**
Georgios-Napoleon Papastavrou, University of Thessaloniki, Greece
Georgios-Panagiotis Kousiopoulos, University of Thessaloniki, Greece
Dimitrios Kampelopoulos, University of Thessaloniki, Greece
Nikolaos Karagiorgos, University of Thessaloniki, Greece
Dimitrios Porlidas, Hellenic Petroleum S.A, Greece
Spyridon Nikolaidis, University of Thessaloniki, Greece

Session 2.2: Wireless systems
Chairs: Marco Balato, *University of Napoli Federico II, Italy*
Fabio Viola, *University of Palermo, Italy*

165 **An Experimental Validation of the Naïve Approach to Angle of Arrival Estimation for Green WSNs**
Antonello Florio, Polytechnic University of Bari, Italy
Gianfranco Avitabile, Polytechnic University of Bari, Italy
Giuseppe Coviello, Polytechnic University of Bari, Italy

169 **Efficient Transmission of Live Multi-View Video in LTE-A Cellular Networks using D2D Cooperation**
John Zammit, University of Malta, Malta
Carl James Debono, University of Malta, Malta

175 **Relay Node Selection in Bluetooth Mesh Networks**
Marco Reno, University of Catania, Italy
Raul Rondon, Mid Sweden University, Sweden
Lucia Lo Bello, University of Catania, Italy
Gaetano Patti, University of Catania, Italy
Aamir Mahmood, Mid Sweden University, Sweden
Alfio Lombardo, University of Catania, Italy
Mikael Gidlund, Mid Sweden University, Sweden

181 **A Battery-free Asset Monitoring System based on RF Wireless Power Transfer**
Roberto La Rosa, STMicroelectronis, Italy, Ecole Polytechnique Federale de Lausanne, Switzerland
Catherine Dehollain, Ecole Polytechnique Federale de Lausanne, Switzerland
Filippo Pellitteri, University of Palermo, Italy
Rosario Miceli, University of Palermo, Italy
Patrizia Livreri, University of Palermo, Italy

187 **Self-powered wireless IoT nodes for emergency management**
Massimo Merenda, University Mediterranea of Reggio Calabria, Italy
Riccardo Carotenuto, University Mediterranea of Reggio Calabria, Italy
Francesco Giuseppe Della Corte, University Mediterranea of Reggio Calabria, Italy
Filippo Giammaria Praticò, University Mediterranea of Reggio Calabria, Italy
Rosario Fedele, University Mediterranea of Reggio Calabria, Italy

193 **A Novel Plasmonic Nanoantenna for High Efficiency Energy Harvesting Applications**
Patrizia Livreri, University of Palermo, Italy
Giuseppe Raimondi, University of Palermo, Italy

197 **Optimization of diode bridge rectifier output voltage in Train Suspension Energy Harvesters**
Luigi Costanzo, Università degli Studi della Campania Luigi Vanvitelli, Italy
Alessandro Lo Schiavo, Università degli Studi della Campania Luigi Vanvitelli, Italy
Massimo Vitelli, Università degli Studi della Campania Luigi Vanvitelli, Italy
Lei Zuo, Virginia Tech, USA

Session 2.3: Artificial Intelligence and Big Data Analytics
Chairs: Francesco Masulli, *University of Genova, Italy*
Ethem Alpaydn, *Bogazici University, Turkey*

202 **Negative Selection Algorithm Based Intrusion Detection Model**
Salau-Ibrahim Taofeekat Tosin, Al-Hikmah University, Nigeria
Jimoh Rasheed Gbenga, University of Ilorin, Nigeria

Session 2.4: Robotics, Automation and Advanced Manufacturing

Chairs: Adriano Fagiolini, *University of Palermo, Italy*
   Izzal Azid Sheikh, *University of South Pacific, Fiji*

TRACK 3 - SMART HEALTHCARE

Session 3.1: Services, Applications and Solutions to Challenging Problems in Smart Healthcare

Chairs: Andreas Panayides, *University of Cyprus, Cyprus*
Carmelina Ruggiero, *University of Genova, Italy*

Session 3.2: Big Data Integration and Personalised Medicine in Smart Health Care

Chairs: Themis Exarchos, *Ionian University, Corfu, Greece*
Luca Faes, *University of Palermo, Italy*

298 **Personalized Detection of Explosive Cough Events in Patients With Pulmonary Disease**
Bruno M. Rocha, Univ. Coimbra, Portugal
Diogo Pessoa, Univ. Coimbra, Portugal
Alda Marques, Univ. Aveiro, Portugal
Paulo Carvalho, Univ. Coimbra, Portugal
Rui Pedro Paiva, Univ. Coimbra, Portugal

302 **The quality concerns in health care Big Data**
Andrea Molinari, University of Trento, Italy
Giandomenico Nollo, University of Trento, Italy

306 **Low invasive multisensor acquisition system for real-time monitoring of cardiovascular and respiratory parameters**
Riccardo Pernice, University of Palermo, Italy
Antonino Parisi, University of Palermo, Italy
Saverio Guarino, University of Palermo, Italy
Giorgio Fallica, STMicrolectronics, Italy
Vincenzo Vinciguerra, STMicrolectronics, Italy
Giuseppe Ferla, STMicrolectronics, Italy
Luca Faes, University of Palermo, Italy
Alessandro Busacca, University of Palermo, Italy

311 **Patient-specific Fluid Dynamical Evaluation of Hypoplastic Left Heart Syndrome Surgical Treatment**
Giuseppe D'Avenio, Istituto Superiore di Sanità Rome, Italy
Aurelio Secinaro, Bambino Gesù Children's Hospital, Italy
Antonio Amodeo, Bambino Gesù Children's Hospital, Italy
Mauro Grigioni, Istituto Superiore di Sanità Rome, Italy

315 **Prediction of Cardiovascular Complications in Diabetes from Pharmacy Administrative Claims**
Enrico Longato, University of Padova, Italy
Gian Paolo Fadini, University of Padova, Italy
Giovanni Sparacino, University of Padova, Italy
Lorenzo Gubian, Azienda Zero Regione Veneto, Italy
Barbara Di Camillo, University of Padova, Italy

321 **Heart left ventricle segmentation in ultrasound images using deep learning**
Tijana Sustersic, University of Kragujevac, (BioIRC), Serbia
Milos Anic, University of Kragujevac, (BioIRC), Serbia
Nenad Filipovic, University of Kragujevac, (BioIRC), Serbia

Session 3.3: Neural and Cognitive Engineering: Methods and Technological Solutions

Chairs: Anna Maria Bianchi, *Politecnico di Milano, Italy*
Kleanthis Neokleous, *RISE, University of Cyprus, Cyprus*

325 **EEG monitoring during software development**
Alessandra Calcagno, (DEIB) Politecnico di Milano, Italy
Stefania Coelli, (DEIB) Politecnico di Milano, Italy
Ricardo Couceiro, (CISUC) Universidade de Coimbra, Portugal
João Durães, (CISUC) Universidade de Coimbra, Portugal
Caterina Amendola, Politecnico di Milano, Italy
Ileana Pirovano, Politecnico di Milano, Italy
Rebecca Re, Politecnico di Milano, Italy
Anna Maria Bianchi, (DEIB) Politecnico di Milano, Italy

330 **Physiological responses related to pleasant and unpleasant sounds**
Corinna Vitale, Politecnico di Milano, Italy
Paola De Stefano, Politecnico di Milano, Italy
Riccardo Lolatto, Politecnico di Milano, Italy
Anna Maria Bianchi, Politecnico di Milano, Italy

335 **Design and Implementation of Steady State Visual Evoked Potential Based Brain Computer Interface Video Game**
Elifsu Filiz, Istanbul Bilgi University, Galatasaray University, Turkey
Reis Burak Arslan, Galatasaray University, Turkey

339 **CogAR: an augmented reality App to improve quality of life of the people with cognitive impairment**
Mirko Rossi, Sapienza University of Rome, Italy
Giuseppe D'Avenio, Istituto Superiore di Sanità, Italy
Sandra Morelli, Istituto Superiore di Sanità, Italy
Mauro Grigioni, Istituto Superiore di Sanità, Italy

344 **Neonatal Seizures Detection using Stationary Wavelet Transform and Deep Neural Networks: Preliminary Results**
Lorenzo Frassineti, University of Florence, University of Siena, Italy
Daniele Ermini, University of Florence, Italy
Rachele Fabbri, University of Florence, Italy
Claudia Manfredi, University of Florence, Italy

350 **Technical Solution for Burnout, the Modern Age Health Issue**
Simona Riurean, University of Petrosani, Romania
Monica Leba, University of Petrosani, Romania
Andreea Ionica, University of Petrosani, Romania
Yonis Nassar, University of Petrosani, Romania

Session 3.4: Advances in Medical Informatics for HealthCare Applications

Chairs: Efthyvoulos Kyriacou, *Frederick University, Cyprus*
Silvana Quaglini, *University of Pavia, Italy*

354 **eEmergency System to Support Emergency call Evaluation and Ambulance dispatch Procedures**
Efthyvoulos Kyriacou, Frederick University, Cyprus
Riana Constantinou, Ambulance Department State Health Services Organisation Ministry of Health, Cyprus
Chris Kronis, Frederick University, Cyprus
George Hadjichristofi, European University, Cyprus
Constantinos S. Pattichis, University of Cyprus, Cyprus

358 **A Novel Algorithm for the Design of Ketogenic Meals**
Giordano Lanzola, University of Pavia, Italy
Federica Pellegrino, University of Pavia, Italy
Cinzia Ferraris, University of Pavia, Italy
Silvana Quaglini, University of Pavia, Italy

364 **Co-creation of Virtual Reality Re-usable Learning objectives of 360º video scenarios for a Clinical Skills course**
Eirini C. Schiza, RISE, Cyprus
Marios Hadjiaros, RISE, Cyprus
Maria Matsangidou, RISE, Cyprus
Fotos Frangoudes, RISE, Cyprus
Kleanthis Neocleous, RISE, Cyprus
Evangelia Gkougkoudi, University of Cyprus, Cyprus
Stathis Konstantinidis, University of Nottingham, United Kingdom
Constantinos S. Pattichis, RISE, University of Cyprus, Cyprus

368 **Proposal of an Architecture to support High Quality Automatic Data Collection in the context of Multi-Centric Studies**
    Sara Mora, DIBRIS University of Genoa, Italy
    Elena Lazarova, DIBRIS University of Genoa, Italy
    Mauro Giacomini, DIBRIS University of Genoa, Italy

372 **Molecular docking of ursolic acid and Staphylococcus aureus ATPase for antibacterial therapy**
    Norbert Maggi, University of Genoa, Italy
    Anna Maria Schito, University of Genoa, Italy
    Valeria Iobbi, University of Genoa, Italy
    Angela Bisio, University of Genoa, Italy
    Carmelina Ruggiero, University of Genoa, Italy
    Mauro Giacomini, University of Genoa, Italy

376 **A Nested U-Net Approach for Brain Tumour Segmentation**
    Neil Micallef, University of Malta, Malta
    Dylan Seychell, University of Malta, Malta
    Claude Julien Bajada, University of Malta, Malta

382 **An Efficacious MRI Sparse Recovery Method Based on Differential Under-Sampling and k-Space Interpolation**
    Henry Kiragu, University of Nairobi, Kenya
    Elijah Mwangi, University of Nairobi, Kenya
    George Kamucha, University of Nairobi, Kenya

Session 3.5: Biotechnolgies: Advanced Devices and Sensors
Chairs: Almir Badnjević, *International Burch University Sarajevo, Bosnia and Herzegovina*
    Steffen Leonhardt, *RWTH Aachen University, Germany*

388 **Silicon dosimeters based on Floating Gate Sensor: design, implementation and characterization**
    Umberto Gatti, RedCat Devices, Italy
    Cristiano Calligaro, RedCat Devices, Italy
    Aldo Parlato, BlackCat Beyond srl, Italy
    Elio Tomarchio, University of Palermo, Italy
    Evgeny Pikhay, TowerJazz, Israel
    Yakov Roizin, TowerJazz, Israel

393 **Fogging effect correction of Gafchromic HD-V2 film response for its use in high-dose radiotherapy**
    Cristiano Calligaro, RedCat Devices, Italy
    Aldo Parlato, BlackCat Beyond srl, Italy
    Elio Tomarchio, University of Palermo, Italy

397 **A Highly-Configurable Full-Field Stimulus Source for Electroretinography**
    Giulia Crocioni, Politecnico di Milano, Italy, University of Illinois at Chicago, USA
    Giambattista Gruosso, Politecnico di Milano, Italy
    John Hetling, University of Illinois at Chicago, USA

402 **Study on ANN based Upper Limb Exoskeleton**
    Marius Risteiu, University of Petrosani, Romania
    Monica Leba, University of Petrosani, Romania
    Olimpiu Stoicuta, University of Petrosani, Romania
    Andreea Ionica, University of Petrosani, Romania

406 **Ascorbic Acid determination using linear sweep voltammetry on flexible electrode modified with gold nanoparticles and reduced graphene oxide**
    Francesca Mazzara, University of Palermo, Italy
    Bernardo Patella, University of Palermo, Italy
    Giuseppe Aiello, University of Palermo, Italy
    Carmelo Sunseri, University of Palermo, Italy
    Rosalinda Inguanta, University of Palermo, Italy

Session 3.6: Bio-electromagnetic Modelling
Chairs: Paolo Ravazzani, *Institute of Electronics, Information and Telecommunications, CNR, Milano, Italy*

Elisa Francomano, *University of Palermo, Italy*

411 Analysis of ionic channel currents under nsPEFsstimulation by a circuital model of an excitable cell
Patrizia Lamberti, University of Salerno, Italy
Vincenzo Tucci, University of Salerno, Italy
Olga Zeni, IREA, CNR, Italy
Stefania Romeo, IREA, CNR, Italy

415 Mathematical modelling of nuclear medicine data
Michele Piana, University of Genova, Italy
Giacomo Caviglia, University of Genova, Italy
Sara Sommariva, University of Genova, Italy

419 Localization of neural activity from neuromagnetic data using varying-support sources
Cristina Campi, Università degli Studi di Padova, Italy

424 Numerical modelling of temperature increase induced by transcutaneous Spinal Direct Current Stimulation (tsDC)
Serena Fiocchi, IEIIT, CNR, Italy
Marta Bonato, IEIIT, CNR, Politecnico di Milano, Italy
Emma Chiaramello, IEIIT, CNR, Italy
Silvia Gallucci, IEIIT, CNR, Italy
Gabriella Tognola, IEIIT, CNR, Italy
Paolo Ravazzani, IEIIT, CNR, Italy
Marta Parazzini, IEIIT, CNR, Italy

429 Stochastic Dosimetry applied on a low frequency Near-Field Source Scenario
Marta Bonato, IEIIT, CNR, Politecnico di Milano, Italy
Emma Chiaramello, IEIIT, CNR, Italy
Serena Fiocchi, IEIIT, CNR, Italy
Silvia Gallucci, IEIIT, CNR, Italy
Laura Dossi, IEIIT, CNR, Italy
Gabriella Tognola, IEIIT, CNR, Italy
Paolo Ravazzani, IEIIT, CNR, Italy
Marta Parazzini, IEIIT, CNR, Italy

434 Fake Nodes approximation for Magnetic Particle Imaging
Stefano De Marchi, Università di Padova, Italy
Wolfgang Erb, Università di Padova, Italy
Elisa Francomano, Università di Palermo, Italy
Francesco Marchetti, Università di Padova, Italy
Emma Perracchione, Università di Genova, Italy
Davide Poggiali, Università di Padova, Italy

439 An advanced numerical treatment of EM absorption in human tissue
Guido Ala, Università di Palermo, Italy
Elisa Francomano, Università di Palermo, Italy
Monica Millunzi, Università di Palermo, Italy
Marta Paliaga, Università di Palermo, Italy

TRACK 4 - SMART GRIDS

Session 4.1: Smart and sustainable islands
Chairs: Enrico De Tuglie, *Politecnico di Bari, Italy*
Marina Bonomolo, *University of Palermo, Italy*

443 Discrete Event Controllers for Grids' Lines
Ciufudean Calin, Stefan cel Mare University, Romania
Buzduga Corneliu, Stefan cel Mare University, Romania

447 **Space charge accumulation in undersea HVDC cables as function of heat exchange conditions at the boundaries – water-air interface**
Giuseppe Rizzo, L.E.PR.E. HV Laboratory University of Palermo, Italy
Pietro Romano, L.E.PR.E. HV Laboratory University of Palermo, Italy
Antonino Imburgia, L.E.PR.E. HV Laboratory University of Palermo, Italy
Fabio Viola, L.E.PR.E. HV Laboratory University of Palermo, Italy
Giuseppe Schettino, L.E.PR.E. HV Laboratory University of Palermo, Italy
Graziella Giglia, L.E.PR.E. HV Laboratory University of Palermo, Italy
Guido Ala, L.E.PR.E. HV Laboratory University of Palermo, Italy

453 **Flexibility Services in a Mediterranean Small Island to Minimize Costs and Emissions Related to Electricity Production from Fossil Fuels**
Domenico Curto, University of Palermo, Italy
Vincenzo Franzitta, University of Palermo, Italy
Sonia Longo, University of Palermo, Italy
Francesco Montana, University of Palermo, Italy
Eleonora Riva Sanseverino, University of Palermo, Italy
Enrico Telaretti, Università degli Studi di Palermo, Italy

459 **Experimental results on the economic management of a smart microgrid**
Alessia Cagnano, Polytechnic University of Bari, Italy
Enrico De Tuglie, Polytechnic University of Bari, Italy
Francesco Marcone, Polytechnic University of Bari, Italy
Giuseppe Porro, Polytechnic University of Bari, Italy
Desire Dauphin Rasolomampionona, Warsaw University of Technology, Poland
Mariusz Klos, Warsaw University of Technology, Poland
Salvatore Favuzza, University of Palermo, Italy
Gaetano Zizzo, University of Palermo, Italy

464 **Optimal management of Islanded Distribution Networks including Multi-Energy Storage Units**
Andrea Cervi, Interdepartmental Centre Giorgio Levi Cases, Italy
Massimiliano Coppo, University of Padova, Italy
Marco Agostini, Interdepartmental Centre Giorgio Levi Cases, Italy
Roberto Turri, University of Padova, Italy

470 **A DC-Link Voltage Control Strategy for Fast Frequency Response Support**
James Amankwah Adu, University of Bologna, Italy
Fabio Napolitano, University of Bologna, Italy
Carlo Alberto Nucci, University of Bologna, Italy
Juan Diego Rios Penaloza, University of Bologna, Italy
Fabio Tossani, University of Bologna, Italy

476 **Sizing and operation of a residential PV-battery system: Rule-Based and real time vs optimization and perfect foresight**
Elena Sedano Ruiz, Universidad de Malaga, Spain
Jesus Huete Cubillo, Universidad de Malaga, Spain
Jorge de la Vega Rodrıguez, Universidad de Malaga, Spain
Sebastian Martın, Universidad de Malaga, Spain

Session 4.2: Net zero energy systems

Chairs: Giorgio Graditi, *ENEA, Italy*
Georgios Christoforidis, *Western University of Macedonia, Greece*

482 **Rotor Speed Fluctuation Analysis for Rapid De-Loading of Variable Speed Wind Turbines**
Fan Xinkai, University of Pisa, Italy, Xi'an Jiaotong University, China
Emanuele Crisostomi, University of Pisa, Italy
Baohui Zhang, Xi'an Jiaotong University, China
Dimitri Thomopulos, University of Pisa, Italy

Session 4.3: The Mediterranean Energy Hub

Chairs: Tuan-Quoc Tran, *CEA-INES, France*
Jaser A. Sa'ed, *Birzeit University, Palestine*

529 A co-simulation approach for validating agent-based distributed algorithms in smart grid
   Minh-Tri Le, Univ Grenoble Alpes, France
   Tung-Lam Nguyen, Univ. Grenoble Alpes, CNRS, France
   Quoc-Tuan Tran, Univ Grenoble Alpes, France
   Yvon Besanger, Univ. Grenoble Alpes, CNRS, France
   Tran-The Hoang, Univ. Grenoble Alpes, CNRS, France

535 Oil & Gas Project: Achieve Power Flexibility Improving Innovation, Integration and Sustainability.
   Stefano Bertazzi, Raffineria di Milazzo, Italy
   Riccardo Martini, Advanced Services Leader, Italy
   Fabio Corgiolu, Terna Rete Italia, Italy
   Gianfrancesco Licandro, Raffineria di Milazzo, Italy
   Maurizio Soglio, ABB Power Grids Italy, Italy
   Antonio Limone, Terna Rete Italia, Italy
   Francesco Saitta, Raffineria di Milazzo, Italy
   Marco Ghisio, ABB Milan, Italy
   Vincze Jeno, GE Global Services, Hungary
   Alessandro Di Paola, Termica Milazzo, Italy

Session 4.4 - PART I: Demand response and prosumers' aggregation

Chairs: Diego Arnone, *Engineering S.p.A. - Italy*
   Francesco Grasso, *University of Firenze, Italy*

541 Dynamic Coalitions of Prosumers in Virtual Power Plants for Energy Trading and Profit Optimization
   Giuseppe Raveduto, Engineering Ingegneria Informatica Spa, Italy
   Vincenzo Croce, Engineering Ingegneria Informatica Spa, Italy
   Marcel Antal, Technical University of Cluj-Napoca, Computer Science, Romania
   Claudia Pop, Technical University of Cluj-Napoca, Romania
   Ionut Anghel, Technical University of Cluj-Napoca, Romania
   Tudor Cioara, Technical University of Cluj-Napoca, Romania

547 Implementation of a Management System for Prosumer Energy Storage Scheduling in Smart Grids
   Giovanni Artale, Università di Palermo, Italy
   Giuseppe Caravello, Unversity of Palermo, Italy
   Antonio Cataliotti, Università degli Studi di Palermo, Italy
   Valentina Cosentino, University of Palermo, Italy
   Salvatore Guaiana, Università di Palermo, Italy
   Dario Di Cara, National Research Council, Italy
   Nicola Panzavecchia, National Research Council, Italy
   Giovanni Tinè, National Research Council, Italy
   Vincenzo Antonucci, National Council of Research (CNR), Italy
   Davide Aloisio, National Council of Research (CNR), Italy
   Giovanni Brunaccini, National Research Council (CNR), Italy
   Marco Ferraro, National Council of Research (CNR), Italy
   Francesco Sergi, National Council of Research (CNR), Italy

553 Ensemble learning with time-series clustering for aggregated short-term load forecasting
   Petar Sarajcev, University of Split, Croatia
   Damir Jakus, University of Split, Croatia
   Josip Vasilj, University of Split, Croatia

559 Unsupervised learning procedure for NILM applications
   Gilles Jacobs, Ecole Polytechnique de Bruxelles, Universite Libre de Bruxelles, Belgium
   Pierre Henneaux, Ecole Polytechnique de Bruxelles, Universite Libre de Bruxelles, Belgiuma

---

Session 4.4 - PART II: Demand response and prosumers' aggregation

Chairs: Diego Arnone, *Engineering S.p.A. - Italy*
          Francesco Grasso, *University of Firenze, Italy*

Session 4.5: Special Technical Session - Italian Divertor Tokamak Test Facility

Chair: Pietro Zito, *ENEA, Italy*

611 **Advanced Image-Processing for the Estimation of Pitch Angle for Runaway Electrons in Tokamaks**
Concetta Barcellona, DIEEI, University of Catania, Italy
Maide Bucolo, DIEEI, University of Catania, Italy
Giovanna Stella, DIEEI, University of Catania, Italy
Arturo Buscarino, DIEEI, University of Catania, Italy
Luigi Fortuna, DIEEI, University of Catania, Italy
Giuseppe Mazzitelli, ENEA, Italy
Basilio Esposito, ENEA, Italy

617 **Conceptual Design and Modeling of the Toroidal Field Coils Circuit of DTT**
Pietro Zito, ENEA, Italy
Giordano Tomassetti, ENEA, Italy
Giuseppe Messina, ENEA, Italy
Luigi Morici, ENEA, Italy
Chiarasole Fiamozzi Zignani, ENEA, Italy
Alessandro Lampasi, ENEA, Italy
Guido Ala, University of Palermo, Italy
Gaetano Zizzo, University of Palermo, Italy
Carmelo Riccardo Lopes, University of Palermo, Italy

623 **Conceptual Design and Modeling of Fast Discharge Unit for Quench Protection of Superconducting Toroidal Field Magnets of DTT**
Carmelo Riccardo Lopes, University of Palermo, Italy
Pietro Zito, ENEA, Italy
Alessandro Lampasi, ENEA, Italy
Guido Ala, University of Palermo, Italy
Gaetano Zizzo, University of Palermo, Italy
Eleonora Riva Sanseverino, University of Palermo, Italy

629 **The Heating & Current Drive System of Divertor Tokamak Test (DTT)**
Gustavo Granucci, CNR, Italy
GianLuca Ravera, ENEA, Italy
Alessandro Bruschi, CNR, Italy
Silvio Ceccuzzi, CNR, Italy
Piero Agostinetti, Consorzio RFX, Italy
Saul Garavaglia, CNR, Italy
Afra Romano, ENEA, Italy
Alberto Ferro, Consorzio RFX, Italy

634 **Poloidal Power Supply System of the Divertor Tokamak Test (DTT) Facility**
Alessandro Lampasi, ENEA, Italy
Alessandro Cocchi, University of Rome Sapienza, Italy
Roberto Romano, ENEA, Italy
Pietro Zito, ENEA, Italy

R8 STUDENT PAPER CONTEST SESSION