



**IEEE 14th International Conference
on Compatibility, Power Electronics
and Power Engineering
IEEE CPE-POWERENG 2020**



1-3 April, 2020
Setúbal, Portugal

Proposal for IEEE CPE-POWERENG 2020 Special Session

Special Session on: **Electric Vehicles and Smart Grids**

Technical Outline of the Session (100-200 words) and Topics:

The interaction of electric vehicles and smart grids will involve synergetic hardware and control strategies and will engage the active and collaborative support of the various players in the energy market. Taking into account the advantages of electric vehicles and smart grids, new technological improvements in these areas are of paramount relevance, contributing to global sustainability. The cooperation of electric vehicles and smart grids can also contribute to deal with the seasonal power production from renewables and to support energy storage systems, globally, contributing to meet with environmental targets. Furthermore, relevance is also recognized from the perspective of the power quality offered by the smart grid to the electric vehicles, as well as the impact induced by electric vehicles in the power quality of the smart grid. Based on the present status, this special session aims to launch future perspectives of electric vehicles and smart grids, collecting theoretical and technological research results, and allowing the participation of academic researchers and professional communities. The essential topics of interest are linked, but not limited to:

- Unified technologies for integrating renewables and energy storage systems with electric vehicles and smart grids;
- Advanced operation modes of electric vehicles in on-grid and off-grid scenarios;
- Analysis of power quality issues and innovative solutions for electric vehicles and smart grids;
- Electric vehicles integration in smart homes or microgrids as smart grid enabler;
- Charging systems for industrial, commercial, and residential scenarios;
- Innovative technologies of propulsion systems for electric vehicles;
- Wireless power transfer systems for electric vehicles;
- Power management and decision, and demand response for smart grids;
- Electrical machines and power electronics drivers;
- Hybrid propulsion technologies for electric aircrafts;
- Power electronics converters (e.g., power supply and motor drivers) for electric aircrafts;
- Energy storage management in electric aircrafts.

Special Session Organizers (names and contact emails):

- João L. Afonso – University of Minho – jla@dei.uminho.pt
- Vítor Monteiro – University of Minho – vmonteiro@dei.uminho.pt
- Gabriele Grandi – University of Bologna – gabriele.grandi@unibo.it
- Mattia Ricco – University of Bologna – mattia.ricco@unibo.it

Special Session Organizers (short bios with photo):



João L. Afonso – jlafonso@dei.uminho.pt (M'00, SM'16) was born in Rio de Janeiro, Brazil, in 1963. He received the B.S. and M.Sc. degrees in Electrical Engineering from the Federal University of Rio de Janeiro in 1986 and 1991, respectively, and the Ph.D. degree in Industrial Electronics from the University of Minho, Guimarães, Portugal, in 2000. Since 1993, he has been with the Department of Industrial Electronics, University of Minho, where he is Associate Professor with Habilitation. He teaches Electrical Machines, Complements of Power Electronics, Electrical Power Quality, Active Power Filters and Renewable Energy. He is coordinator and researcher with the Group of Energy and Power Electronics (GEPE) of the ALGORITMI research center. His research interests include: Power Quality, Active Power Filters, Renewable Energy, Electric Vehicles, Energy

Efficiency, Energy Storage Systems, Innovative Railway Systems, Smart Grids and Smart Cities.



Vítor Monteiro – vmonteiro@dei.uminho.pt (S'10) was born in Guimarães, Portugal, on May 1984. He received the Ph.D. degree in Power Electronics and Energy Systems in 2016 from the School of Engineering, University of Minho, Guimarães, Portugal. Since September 2016, he is Invited Professor in the Industrial Electronics Department at the University of Minho, and his research activity has been developed at the Centro ALGORITMI, University of Minho. His main research interests are related with power electronics for smart grids, namely, new topologies of power electronics converters and digital control strategies for electric mobility, renewable energy, power quality, active power conditioners, energy storage systems, and solid state

transformers. Dr. Monteiro is a member of the IEEE Industrial Electronics and IEEE Vehicular Technology Societies.



Gabriele Grandi – gabriele.grandi@unibo.it (M'00, SM'13) received the M.Sc. (cum laude) and Ph.D. degrees in electrical engineering from the University of Bologna, Bologna, Italy, in 1990 and 1994, respectively. He has been with the Department of Electrical, Electronic, and Information Engineering, University of Bologna, as Research Associate (since 1995), Associate Professor (since 2005), and actually as Full professor (since 2016), in electrical engineering. He is the Head of the SolarTronic-Lab at University of Bologna. He has authored or co-authored more than 160 papers in conference proceedings and international journals, mainly with the IEEE. His main research interests include power electronic circuits, multiphase and multilevel converters, photovoltaics, and circuit modeling. Dr. Grandi actually serves as Editor-at-Large for IET Power Electronics,

Academic Editor for MDPI Energies, MDPI Electronics, and Associate Editor for IEEE Trans. on Industrial Electronics.



Mattia Ricco – mattia.ricco@unibo.it (M'16, SM'19) received the master's degree (cum laude) in Electronic Engineering from the University of Salerno in 2011. He received the Ph.D. degrees in Electrical and Electronic Engineering from the University of Cergy-Pontoise (France) and in Information Engineering from the University of Salerno (Italy) in 2015. From 2015 to 2018 he has been a Postdoctoral research fellow at Aalborg University (Denmark) in the Energy Technology Department. He is currently a Senior Assistant Professor with the Department of Electrical, Electronic and Information Engineering “Guglielmo Marconi” - DEI, University of Bologna. His research interests include power electronics, FPGA/SoC based controllers, battery management

systems, electric vehicle chargers, modular multilevel converters and photovoltaic systems.