

Annual Conference of the IEEE Industrial Electronics Society (IECON 2021)

Special Session on

“Advanced Technology for Electric Vehicle Charging Systems and its Management”

Organized by

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Call for Papers

Theme:

Electric vehicles (EVs) transportation has become a progressive technology in the mainstream transportation solution. Since EVs are considered to be a dynamic load, managing the available grid or renewable supported electrical power to the EVs charging plug spot are involving various parameters. From the customer surveys and EV marketing specialists say that the key complications to the uptake of EVs are long driving range and battery recharge-time anxiety. Foremost drawback of EV is the opportunities to recharge the vehicle battery have become a difficult subject. Shortcomings of present's technology battery include cost, size, weight, slower charging and low energy density. For example, Lithium-Ion complete battery pack energy density is around 100 Wh/kg. Wireless power transfer (WPT), which transmits power by an electromagnetic field across an intervening space, provides the prospect of new opportunities for electric vehicles (EVs) to enhance sustainable mobility.

However, either used plugged in charging or WPT, due to the high charging power demand the future power grid has a strong impact in their power management. Subsequently the uncertainty in the number, capacity, type and initial circumstances of EVs driving and user behaviours, the appropriate design of EV charging systems, and

its management strategies are precarious. The integration of renewable energy resources (e.g., wind and solar) further obscures EV charging system management. A wide-ranging effort is compulsory to provide scalability, flexibility and autonomy in Electric vehicles charging systems in static and dynamic environments.

This Special Issue on “A Progressing Technology for Electric Vehicle Charging Systems and Management” is intended to motivate further research and development of future EV charging systems which covers the design and development of EV chargers, emerging power converter topologies, control technologies implementation, energy management strategies, and investigating the integration of the charging stations with renewable energy and energy storage

Topics of interest include, but are not limited to:

We encourage all researchers working in this area to submit original research contribution with subjects not limited to:

- Compact and flexible on-board fast EV chargers.
- State-of-the-art in IPT/CPT technologies.
- Resonant power electronic converters and compensation techniques
- Capacitive coupling, Inductive coupling for wireless power transfer—Power electronics and control.
- Novel Power Electronics converter topologies, including their control techniques
- Intelligent Battery management system for WPT Charging.
- EMI/EMC issues and mitigation techniques.
- Intelligent EV fleet charging management.
- Intelligent control and energy management strategies.
- Analysis and modelling of power electronic converters for EV chargers.
- Digital controller architecture (microcontrollers, DSPs, and FPGAs) for EV charge Power Management.
- Energy storage system integration with charging station.
- Charging station Grid integration – V2B, V2G, V2V
- Power quality management, analysis and control.
- Predictive resilience analysis and Resilience driven system design.
- Novel applications in electric vehicles, smart grid, energy-aware buildings, etc.,

Submissions Procedure: All the instructions for paper submission are included in the conference website: <https://attend.ieee.org/iecon-2021/>

Deadlines:

Full paper submission:	June 25, 2021
Paper acceptance notification:	July 30, 2021
Camera-ready paper submission:	Aug. 27, 2021

Reviewers

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Background of the organizers



Bharatiraja Chokkalingam (Senior Member, IEEE) Dr. C. Bharatiraja received the Bachelor of Engineering in Electrical and Electronics Engineering from Kumaraguru College of Engineering, Coimbatore, India, in 2002 and the Master of Engineering degree in Power Electronics Engineering from Government College of Technology, Coimbatore, India, in 2006. He received Ph.D. in 2015. He completed his 1st Postdoctoral Fellowship at Centre for Energy and Electric Power, Faculty of Engineering and the Built Environment, Tshwane University of Technology, South Africa in 2016 with National Research Foundation funding. He was the award recipient of DST; Indo-U.S Bhaskara Advanced Solar Energy at 2017 and through he completed

his 2nd Postdoctoral Fellowship at Department of Electrical and Computer Engineering, Northeastern University, USA. He is a Visiting Researcher Scientist at Northeastern University, Boston, USA. He is a Visiting Researcher at University of South Africa. He is also an Award recipient of Young Scientists Fellowship, Tamil Nadu State Council for Science and Technology at 2018. He is also an Award recipient of Young Scientists Fellowship, Tamil Nadu State Council for Science and Technology at 2018. He was collaborated with leading Indian overseas universities for both teaching and research.

He has completed 6 sponsored projects from various government and private agencies. He also signed MoU with various industries. Currently he is running two Three Government funding agency funded projects. He is a senior Member IEEE, IEI, and IET. Dr.C.Bharatiraja is currently working as an Associate Professor at Department of Electrical and Electronics Engineering, SRM Institute of Science and Technology, Kattankulathur Campus, Chennai, India.

His research interest includes power electronics converter topologies, and controls for PV and EV applications, PWM techniques for power converters and adjustable speed drives, wireless power transfer and smart grid. He has authored more than 100 research papers, which are published in international journal including various IEEE transactions.



Sheldon S. Williamson (Fellow, IEEE) received the Ph.D. degree (Hons.) in electrical engineering from the Illinois Institute of Technology, Chicago, IL, USA, in 2006. He is currently a Professor with the Smart Transportation Electrification and Energy Research Group, Department of Electrical, Computer, and Software Engineering, University of Ontario Institute of Technology, Oshawa, ON, Canada. He holds the prestigious Natural Sciences and Engineering Research Council Canada Research Chair position in Electric Energy Storage Systems for Transportation Electrification. His current research interests include advanced power electronics, electric energy storage systems, and motor drives for transportation electrification.



Lucian Mihet-Popa (Senior Member, IEEE) was born in 1969. He received the bachelor's degree in electrical engineering, the master's degree in electric drives and power electronics, and the Ph.D. and Habilitation degrees in electrical engineering from the Politehnica University of Timisoara, Romania, in 1999, 2000, 2002, and 2015, respectively. Since 2016, he has been working as a Full

papers may be considered for publication in the IEEE Trans. on Industrial Electronics, subject to further rounds of review.

Professor in energy technology with the Østfold University College, Norway. From 1999 to 2016, he was with the Politehnica University of Timisoara. He has also worked as a Research Scientist with Danish Technical University from 2011 to 2014, and also with Aalborg University, Denmark, from 2000 to 2002. He held a postdoctoral position with Siegen University, Germany, in 2004. He is also the Head of the Research Lab “Intelligent Control of Energy Conversion and Storage Systems” and is one of the Coordinators of the Master’s degree Program in “Green Energy Technology” with the Faculty of Engineering, Østfold University College. He has published more than 130 papers in national and international journals and conference proceedings, and ten books. He has served as a scientific and technical program committee member for many IEEE conferences. He has participated in more than 15 international grants/projects, such as FP7, EEA, and Horizon 2020. He has been awarded more than ten national research grants. His research interests include modeling, simulation, control, and testing of energy conversion systems, and distributed energy resources (DER) components and systems, including battery storage systems (BSS) [for electric vehicles and hybrid cars and vanadium redox batteries (VRB)] and energy efficiency in smart buildings and smart grids. He was invited to join the Energy and Automotive Committees by the President and the Honorary President of the Atomium European Institute, working in close cooperation with—under the umbrella—the EC and EU Parliament, and was also appointed as the Chairman of AI4People, Energy Section. Since 2017, he has been a Guest Editor of five special issues of *Energies* (MDPI), *Applied Sciences*, *Majlesi Journal of Electrical Engineering*, and *Advances in Meteorology* journals.