

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

Special Session on

“Static and dynamic wireless charging solution for EVs: Coil configuration, design and control of power electronics converters”

Organized by

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Call for Papers

Theme: Wireless charging: Recently, the electric vehicle (EV), which is environmental friendly and energy efficient has widely been used for the transportation system. Static wireless charging (SWC) and dynamic wireless charging (DWC) provides numerous benefits to the electric transportation system which in turn encourages the consumers and manufacturers of EVs towards the sustainable environment. However, there are many challenges such as technological, psychological, economical, commercial and reliability issues pertinent to the implementation of the static and dynamic charging. The emerging research in charging technology including FEM based design of coil

structure, investigation of various structures of track and pick-up coils, misalignment issues & compensation strategies in SWC/DWC and design of novel power converters for SWC/DWC system etc. are competent to accomplish these challenges. This special session is committed to enhance the existing technologies and facilitate a strong pathway to drive the upcoming charging solutions to make them flexible as well as consumer friendly. Unique research and emerging trends on the following mentioned areas are desired. Researchers from both academia and industry are invited to submit their original and unpublished work to this special session.

Topics of interest include, but are not limited to:

- FEM based coil design for SWC/DWC system
- Novel power converters for SWC/DWC system
- Modeling, control analysis, and design of PFC, HFI, and DC-DC power converters
- Advanced control techniques for power electronics converters
- Load independent operation of power converters
- Investigation of various structures of track and pick-up coils
- Multilevel Inverter operation for SWC/DWC system
- Misalignment issues in SWC/DWC system
- Compensation strategies in SWC/DWC system
- Implementation of wide band gap semiconductor devices
- G2V, V2G, and V2V bidirectional power flow analysis
- High-frequency DC/AC inverters and control
- Advanced communication system, implementation of AI techniques and cyber security issues

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

Organizers:

¹**Dr. Subrata Banerjee** (M'-04, SM'-15, IEEE) is Professor & Ex-Head of Department of Electrical Engineering, NIT, Durgapur having a total 30 years of professional experience. His field of research interests include modeling and control of converters and inverters, multilevel inverters and modulation techniques, EV charger, electromagnetic levitation, active magnetic bearing, controller design, intelligent control, etc. He has successfully completed few research and consultancy projects. Prof. Banerjee has received several academic awards, including 10 Nos. Best Paper Awards and the, TATA RAO Prize. He has published 190 Nos. research papers in national/international Journals and conference records & he has published 07 Book Chapters. He has filed three Indian patents & one patent has been granted in his credit. He has guided 10 Nos PhD and 25 Nos M. Tech students and many are pursuing their degree under his guidance. He is acting as Associate Editor of IET Power Electronics (UK) & IEEE Access (USA) & IEEE Transportation Electrification Community eNewsletter (USA). He has chaired and co-chaired several technical sessions in reputed IEEE International Conferences. He is a regular Reviewer for IEEE Transactions on Power Electronics/Industrial Electronics/Industrial Informatics, IET Power Electronics etc. He is a Fellow of IET (UK), IE (India) and IETE (India), senior member of IEEE and a Life Member of the Systems Society of India.



²**Dr. Kundan Kumar** (Member-13, Senior Member-21, IEEE) was born in Godda, India, in 1984. He received the M. Tech. degree in electrical engineering from the National Institute of Technology at Jamshedpur, Jamshedpur, India, in 2010, and the Ph.D. degree in electrical engineering from the University of Padua, Padua, Italy, in 2010 and 2016, respectively. He is currently an Assistant Professor with the Department of Electrical Engineering, National Institute of Technology, Manipur, Imphal, India. His research interests include electric vehicles and its charging infrastructures, application of wide band gap semiconductor devices, and isolated dc-dc converters.



Dr. Kumar is also a member of the Institution of Engineers, India. He was the recipient of Silver Medal for securing the first position during his M. Tech. course and Best Presentation Recognition award at IECON, Japan in 2015. He is also a Reviewer of the IEEE TRANSACTIONS ON INDUSTRIAL ELECTRONICS, the IEEE TRANSACTIONS ON POWER ELECTRONICS, the IEEE TRANSACTIONS ON TRANSPORTATION ELECTRIFICATION, and the IEEE JOURNAL OF EMERGING AND SELECTED TOPICS IN POWER ELECTRONICS. He has chaired and co-chaired several technical sessions in reputed IEEE International Conferences.

³**Dr. Santu Kumar Giri** (M'15, IEEE) received the B.E. and M. E. degrees in electronics and telecommunication engineering from Jadavpur University, Kolkata, India, in 2004 and 2008, respectively, and the Ph.D. degree in electrical engineering from National Institute of Technology, Durgapur, India, in 2018. He is currently working as Principal Scientist with the SET Group, CSIR-Central Mechanical Engineering Research Institute, Durgapur, India. He has successfully executed several research and development projects funded by various agencies including Government of India.



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⁴**Dr. Sarbani Mukherjee** (S'16) received Ph.D. degree in electrical engineering in 2020 from National Institute of Technology, Durgapur, India and working as a Research Fellow in Rolls-Royce@NTU Corporate Laboratory, Singapore. She is currently associated with industrial research in various domain. Her research interests include modulation and control of multilevel converters, power electronic converters for transportation electrification and renewable energy systems. She has published more than 15 research papers in National/International journals and conference records and served as reviewer in many esteemed IEEE journals.



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