# CALL FOR PAPERS

# IEEE TRANSACTIONS ON INDUSTRY APPLICATIONS

## Special Issue on

## FAST, SUPER FAST and ULTRA SUPER FAST Intelligent and Smart Charging Solutions for Electric Vehicles

Despite the growth of Electric Vehicles (EVs) leading toward the 2030 goal, deficiencies in charging infrastructures, extended charging times, range anxiety, and existing battery technology may limit EVs' applicability. These constraints affect the choice of EV for both urban driving (high charging times) and highway driving (range anxiety). Thus, there is a need to reduce EV charging time resulting in a higher power rating of an EV charger. Additionally, this high power must be controlled to achieve optimal efficiency, thermal management, and battery life. Conclusively, the EV charging infrastructure can be significantly improved by increasing the power density of EV chargers, novel EV charging strategies, optimal control algorithm for achieving transient free EV charging, and high-frequency transformer design optimization for ultra-fast EV charging.

Continuous improvement in semiconductor technology and the essential requirement of integrating green power to the EV station have further opened the improvement scope. An interesting feature contributing to EV dynamic nature is the possibility of bidirectional power flow using on-board EV chargers. These bidirectional chargers must be developed seamlessly to manage power flow in both directions with an insignificant difference in efficiency and performance. With the V2G mode's intended operation, benefits such as enhanced grid stability, reduced backup generation capacity, and economical utility cost can be achieved. This Special Issue intends to bring up to debate and present progressive approaches involved in EVs fast charging. Prospective authors are requested to submit innovative contributions for publication in this Special Issue.
Topics of interest include, but are not restricted to:

- Multilevel Converter for Novel charging solutions for off-board EV chargers
- Wide bandgap based high power density power conversion for high-power EV chargers
- Novel high frequency resonant power converters for high-power EV chargers
- Improved design of high—frequency transformers in super-fast charging stations
- Novel control topologies for minimizing charging transients during the transition between charging modes
- Application of advanced control technologies to optimize fast charging performance in EV charging stations

- Accurate and faster mathematical modeling of complex systems consisting of EV, renewables, and grid
- Modeling, analysis and controlling EV battery source as an independent power source
- Energy-efficient high power DC-DC converters for ultra-fast charging configuration
- Design optimization of EV chargers for bidirectional power flow suitability
- Advanced control techniques to implement THD compliant hysteresis current control strategies for EV charging loads
- Power-dense power converters for the integration of renewables to the EV charging stations

**Submission Guidelines**

Authors who wish to submit a paper for consideration must submit an extended abstract (2 pages, free format, PDF version) to the Guest Editors identified below. Authors who submit an accepted abstract will receive a formal invitation with detailed instructions for submission of the complete manuscript to the IAS ScholarOne Manuscripts site. Manuscripts submitted for this Special Issue will be reviewed separately and will be handled by a Guest Editorial Board.

**Important Dates (Tentative)**

- July 31, 2021: Deadline for extended abstract submission
- September 11, 2021: Deadline for decision notification for inviting full paper submissions
- October 09, 2021: Deadline for full paper submission for review in S1M and copyright transfer
- April 09, 2022: Notification of final decisions
- May 07, 2022: Deadline for submission of Final Files in ScholarOne Manuscripts
- May 21, 2022: All approved manuscripts transmitted electronically to IEEE for publication

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