As a significant part of the next-generation smart grid, the commercial electric vehicles (EVs) are essential for majorities of countries to gain energy independence on imported fuel oil. EVs have rapidly grown in population, but the slow recharge time is still identified as the biggest obstacle to their widespread adoption. The industry is on the way to addressing the slow recharging issue for EVs by increasing the rate of charging to 350 kW, known as extreme fast charging (XFC). However, this technology introduces a series of new challenges, which requires the intelligent control for a different power train architecture and components from the current EV offerings. Much research effort has been devoted to the XFC technology for EV application in view of battery, high-voltage system architecture and power electronics design, infrastructures, CPS's security and stability to power grid, which provides the unique bridge for an interdisciplinary research cross the new XFC technology.

This special issue is to disseminate the new research outputs and practical application in the XFC technology for EV applications. Prospective authors are invited to submit the original contributions, survey for review for the potential publication in this special issue. Topics of interest includes, but are not limited to:

- Analysis of battery materials degrading subjected to the XFC.
- Robust battery management system and cell-balancing design of batteries subjected to high rate charging.
- Traction motor and power electronics design and its control for high operating voltage applications to XFC-enabled EVs.
- The application of wide bandgap semiconductor devices to XFC technology.
- High-voltage system architecture reevaluation and design for XFC applications.
- Reliability testing and evaluation of existing vehicles to XFC charger connectors.
- Cyber-physical security and for EVs and XFC infrastructure.
- Modeling of the XFC-capable EV individual and its interactions with infrastructure.
- Advanced charging guidance and control for the XFC-capable EVs.
- Optimal planning of XFC stations and networks.
- Big data applications in XFC system.
- Data processing and communication systems for EV Charging networks.
- Artificial intelligence for EV Charging networks.
- Internet of things for electric vehicles.
- XFC for EV fleet.

All manuscript must be submitted through Manuscript Central at [https://mc.manuscriptcentral.com/t-its](https://mc.manuscriptcentral.com/t-its). Submission must be clearly marked by “Enabling Extreme Fast Charging Technology for Electric Vehicles” on the cover page. When uploading your paper, please select your manuscript type as “Special Issue”. Manuscript submitted for this special issue will be reviewed separately and will be handled by the guest editorial board noted below.

**Deadline for Submission of Manuscript:** Oct. 15th, 2019-Dec. 30, 2019

**Guest Editors:**
- Dr. Xi Chen, GEIRI North America, San Jose, CA, USA (xc@ieee.org)
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**Proposed Timeline:**
- **Oct. 15th, 2019-Dec. 30, 2019** Manuscript submission deadline
- **Nov. 15th, 2019-Jan. 31, 2020** Completion of 1st round review
- **Dec. 15th, 2019-Mar. 30, 2020** Revision submission deadline
- **Jan. 15th, 2020-Apr. 30, 2020** Final acceptance notification