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Special Session on

Data-driven Design for Electrical Machines: Methodology, Modelling, and Multidisciplinary Optimization

Organized and co-chaired by

- Dr. Yang Xiao – University of Leicester, UK – yx224@leicester.ac.uk
- Dr. Yiming Ma– CSG PGC Energy Storage Research Institute, China – mayiming@ieee.org

Call for Papers

With the rapid development of renewable energy generation, electrified transportation and high-precision manufacturing, the performance requirements for electrical machines have reached unprecedented levels, in particular for complex operation duty cycle, multi-disciplinary design, and the integration between machines and drives. Traditional physics-driven design methods, including analytical and numerical solutions, are struggling to cope with the ever-increasing demands due to either accuracy or efficiency issues. In this context, significant interests have been given to data-driven design technology, such as surrogate-assisted approaches. Although initial investigations have provided encouraging feedbacks as an emerging cutting-edge breakthrough, data-driven design for electrical machines is facing significant challenges, e.g. explainable modelling, high-fidelity surrogate network generation, substantial costs of training, and inter-disciplinary optimization methods, robust design considering manufacturing uncertainty, etc. Therefore, more efforts are required in methodology, modelling and multidisciplinary optimization to address the existing issues for data-driven design of electrical machines.

This Special Session aims to provide a forum for worldwide researchers in academia and industry to share their contributions and discuss further advances in the subject of data-driven design for electrical machines. Manuscripts with original ideas and both theoretical and practical contributions are warmly welcome.

Topics of interest include, but are not limited to:

- Advanced design of experiment (DoE) techniques
- Efficient multiple-fidelity model generation
- Data-driven stochastic and heuristic algorithm

- Multi-disciplinary optimization technique
- Robust design considering manufacturing uncertainty
- Multi-operating point design considering operational characteristics
- Integration design between electric machine and drive system

Submission of papers: paper submission follows the rules of regular papers. All the instructions for paper submission are included in the conference website https://icem.cc/2024