IEEE Industrial Electronics Society

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Special Session on

Advancement in Power Electronics Converters: Innovative Topologies, Optimal Control, and Intelligent Maintenance

Organized and co-chaired by:

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Call for Papers

Technical Outline of the Session and Topics:

The realm of power electronics converters (PECs) is undergoing a significant revolution, driven by the increasing demand for efficient energy conversion in various applications, including renewable energy systems, electric vehicles, data centers, and smart grids. The fundamental performance of PECs is dependent on their topologies, and it is a great opportunity to derive new topologies with suitable performance to meet the increasing requirements in practical applications. It is noted that control strategies are pivotal for maximizing or balancing the performance of a specific PEC. Many mature control strategies have been successfully applied in PECs, but with the advent of new topologies and applications, it is still worthwhile to explore whether there are more optimal control strategies available. Apart from topologies and control, maintenance has become increasingly important in extending the lifespan and reliability of PECs. The advent of artificial intelligence (AI) and machine learning (ML) algorithms has opened up new possibilities for predictive maintenance and fault diagnosis. It is time to develop an intelligent maintenance system for PECs to reduce downtime and operational costs. This session aims to provide a timely opportunity for academic researchers and industrial engineers to present, discuss, and exchange the latest advancements in PECs, focusing on innovative topologies, optimal control strategies, and intelligent maintenance techniques that are shaping the future of electrical energy systems.

Topics of the Session include, but are not limited to:

- Innovative topologies of PECs for various practical applications.
- Novel topologies of PECs with new components, like GaN and SiC devices.
- Topology derivation methods with new technologies, like graph theory, network theory, and ML.
- Modeling technologies of PECs.
- Control theory of PECs.
- Fault-tolerant control of PECs.
- Prognostics and health management of PECs, including condition monitoring, fault diagnosis, prognostics, etc.
- Review papers on PECs techniques and development.

Author's schedule:

Deadline for submission of special session papers	April 15, 2024
Notification of acceptance	June 10, 2024
Deadline for submission of final manuscript	July 01, 2024

Early submission is highly encouraged for early decision notifications!

All the instructions for paper submission are included in the conference website: www.iecon-2024.org