

## Call for Papers for the Special Session on

### Artificial Intelligence and Advanced Control in Power Conversion and Management Systems for Distributed Energy Resources Integration

#### Organizers and Co-chairs

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#### Technical Outline of the Session and Topics

With the increase of micro to mega power ranges distributed energy resources, the field of power conversion and management systems (PCMS) is undergoing a revolution driven by the increasing demand for efficient energy conversion. It's crucial to develop new topologies and control strategies to meet the growing requirements in practical applications. The use of artificial intelligence (AI) and advanced control in power converters and management systems is crucial for improving the efficiency and reliability of electrical systems. By leveraging the power of AI, engineers and researchers can unlock new levels of adaptability and efficiency in power conversion and management processes, resulting in more intelligent and resilient systems.

#### Topics of this Special Session Include but are not limited to

- Energy harvesting techniques and power management systems for IoT and other micro-power applications.
- Innovative topologies of power converters for various micro to mega-power distributed energy sources
- PCMS for conductive and wireless power transfer for various applications.
- Application of AI (including machine learning, deep learning, and data-driven) algorithms for PCMS.
- Application of advanced control techniques (such as sliding mode control, Lyapunov-based control, passivity-based control, model predictive control, adaptive and self-learning) for PCMS.
- Use of AI for predictive maintenance, fault diagnosis, and cyber-secured PCMS
- Advancement in power semiconductor devices for PCMS.
- DERs integration and PCMS for on/off-grid demand management, ensuring the stability of the networks
- Applications of micro to mega power ranges PCMS with various energy harvesters and storage devices.

#### Timeline for Author

Deadline for submission of special session papers January 10, 2025

Notification of acceptance March 10, 2025

Deadline for submission of final manuscripts April 15, 2025

All the instructions for paper submission are available on the conference website.

