CALL FOR PAPERS
SPECIAL SESSION ON

Next-Generation Predictive Maintenance for Electrical Machines and Power Electronic Systems

for ICCAD 2026
July 7-9, 2026, Lisbon, Portugal

Session Co-Chairs:
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Session description:

This special session focuses on next-generation Predictive Maintenance (PdM) strategies for Electrical Machines and Power Electronic Systems, driven by recent advances in data analytics, artificial intelligence (AI), and connected sensing technologies. As modern industrial systems grow in complexity and performance demands increase, traditional maintenance approaches are no longer sufficient to ensure reliability, availability, and cost efficiency. Predictive Maintenance has emerged as a key enabler for anticipating failures, reducing unplanned downtime, and extending the operational lifetime of critical assets.

By leveraging real-time monitoring, advanced signal processing, and machine learning techniques, PdM enables early fault detection, accurate diagnosis, and reliable prognosis of degradation processes in electrical machines, power converters, and drive systems. These capabilities support proactive decision-making, improved resource allocation, and enhanced operational safety in industrial and energy applications.

The session aims to explore emerging methodologies, tools, and applications that define the next generation of PdM, including AI-based fault diagnosis and prognosis, uncertainty-aware health assessment, and fault-tolerant monitoring and control. Particular attention is given to the integration of PdM within cyber-physical systems, Industrial Internet of Things (IIoT) frameworks, and intelligent control architectures.

By bringing together researchers and practitioners, this session will highlight current challenges, innovative solutions, and future trends shaping predictive maintenance technologies, contributing to more sustainable, resilient, and intelligent electrical and power electronic systems.

The topics of interest include, but are not limited to:

- Application of AI for PdM in EMPED
- AI-based fault diagnosis and prognosis for early detection of anomalies
- Fault-tolerant diagnostics and control of EMPED
- Advanced signal processing for EMPED health analysis.
- Advanced methodologies for quantifying uncertainty in prognosis processes.
- Fault detection and diagnostics of multiple failures.

Papers must be submitted electronically for peer review by **January 31, 2026**
https://www.iccad-conf.com/submission/
All papers must be written in English and should describe original work. The length of the paper is limited to a maximum of 6 pages (in the standard IEEE conference double-column format).