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Special Session on

Learning-Based Fault Control, Diagnostics, Prognostics for Intelligent Power and Propulsion Systems

Organized and co-chaired by:

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Call for Papers

Technical Outline of the Session and Topics:

Predictive maintenance (PdM) provides a comprehensive approach to assess the current and future health of an entire system through diagnostics and prognostics. With the rapid advancement of technologies such as the Internet of Things (IoT), Machine Learning (ML), Artificial Intelligence (AI), and Big Data in today's industrial landscape, predictive maintenance is becoming increasingly intelligent. Intelligent Controls, Diagnostics and Prognostics (CoDnP), or CoDnP based on fuzzy logic, neural networks, machine learning, hybrid approaches, and learning methods, have transformed industrial control engineering. This transformation is evident in various applications, including large-scale systems (with numerous continuous variables), autonomous systems, power systems, smart grids, etc. Many automatically controlled systems, especially those in large open environments and certain industrial processes, are large-scale and challenging to model accurately due to their unpredictable or incompletely understood nature. Consequently, there is a growing preference for data-driven and hybrid diagnostics and prognostics solutions over models that rely solely on algorithms. To align with the ongoing digital transformation across industries and expedite the creation of unified predictive maintenance solutions for power and propulsion systems, the need for a learning-based fault-tolerant control, Diagnostics and Prognostics (DnP) solution has become indispensable in today's context.

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

- Fault-tolerant diagnostics and control of power converters
- Fault-tolerant diagnostics and control of three-phase to multiphase electrical motors
- Fault detection, diagnostics and health management of road, water, and air propulsion systems
- Condition monitoring of solid, liquid, gas, and composite insulation in electrical equipments
- Application of AI in condition monitoring of electrical machines, electrical cables, power electronic drives, gas-insulated systems, and DC insulation systems
- Intelligent power and energy management strategies for hybrid power and propulsion systems
- Learning-based control, optimization and digital twins of hybrid zero-emission power and propulsion systems
- Machine learning and deep learning-driven approaches for hybrid energy systems
- Leveraging reinforcement learning techniques to optimize and enhance the performance of power systems
- Integration of data-driven approaches and smart grid technologies to improve the efficiency and reliability of power systems
- Advanced learning methodologies to control and optimize power system operations, including multi-agent systems and large-scale systems
- Observation and estimation of power complex parameters using AI
- Intelligent control strategies for enhancing voltage and frequency stabilities in power systems

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