

ARCAI2024 Special Session on “AI in Power and Energy Circuits and Systems”

Organized by Herbert Ho-Ching Iu and Zhicong Huang

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➤ Call for Papers:

Power and Energy Circuits and Systems (PECAS) community has been investigating artificial intelligence (AI) and machine learning techniques since the 1990s, covering smart grid, power electronics, renewable energy integration, design automation, intelligent control, and smart predictive maintenance. To date, PECAS have been evolving towards data-rich paradigms with ubiquitous connections that support data-driven applications. Many exciting new concepts, state-of-the-art AI tools, and cutting-edge hardware have been emerging and adding new dimensions to PECAS. There are further and greater opportunities for imparting learning capability into systems and underpinning the next quantum leap of smart PECAS. In view of the fast-growing implementations of AI and machine learning techniques in PECAS, this special session aims to inspire ideas and cover the latest research achievements in this promising field. Prospective authors are invited to submit original contributions in this special session. Topics of interest include (but are not limited to):

- AI-assisted design (heatsink, circuitry, magnetics, etc.)
- AI in Design for Reliability (DfR)
- AI for accelerated test planning and experiment
- Intelligent data-driven control and optimization
- Online learning and adaptive control
- Intelligent lifetime extension and power routing
- Digital twin and surrogate models
- Cybersecurity and attack identification
- Physics-informed machine learning for PECAS
- Condition & health monitoring
- Anomaly detection, fault diagnostics, failure prognostics
- Tailored AI for data- and computation-light applications
- Uncertainty quantification and repeatability verification
- IoT, cloud computing, hardware implementation