

Artificial Intelligence for Smart Power, Electrical, Energy and Industrial Systems

Artificial Intelligence (AI) is transforming the design, monitoring, control, and optimization of modern power, electrical, energy, industrial, and mechatronic systems. Advances in machine learning, deep learning, reinforcement learning, digital twins, edge intelligence, and generative AI are enabling smarter, more autonomous, resilient, and sustainable engineering solutions.

This special session provides an interdisciplinary forum for researchers and practitioners from academia and industry to present recent advances in AI methodologies and their applications to intelligent engineering systems. Contributions on novel algorithms, modelling, optimization, monitoring, control, digital twins, experimental validation, and industrial case studies are welcome.

Topics include, but are not limited to:

- Machine learning and deep learning for power and energy systems
- Reinforcement learning and intelligent control
- AI-enhanced modelling, simulation, and optimization
- Intelligent monitoring, fault diagnosis, and predictive maintenance
- Digital twins for electrical and energy systems
- Explainable, trustworthy, and edge AI for engineering applications
- AI for power electronics and electrical drives
- AI for smart grids, microgrids, and distributed energy resources
- AI for renewable energy forecasting and management
- AI for battery management, energy storage, and electric vehicles
- AI for energy management systems and demand response
- AI for cyber-physical energy systems and resilient infrastructures
- Emerging AI applications in power, electrical, and energy engineering
- Any other AI applications relevant to power, electrical, and energy engineering

The session seeks to stimulate discussions on how Artificial Intelligence is reshaping engineering research and industrial practice while addressing key challenges related to robustness, reliability, explainability, cybersecurity, sustainability, and real-world deployment.

Researchers from academia, industry, and research organizations are invited to submit original and unpublished contributions presenting novel methodologies, innovative applications, experimental results, and industrial experiences.

We look forward to welcoming your contributions and fostering fruitful discussions on the future of AI-enabled power, electrical, and energy systems.

Session Organizer

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Research interests: Cyber Physical Systems, Control Systems, Intelligent Automation, Power and Energy Systems, Mechatronics, Robotics, Digital Twins, System Identification, Fault Diagnosis, Smart Systems.

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