

Special Section on:
Artificial Intelligence & Machine Learning Applications in Smart Inverters
 (Sponsored by: TC on Power Electronics)

Theme: Nowadays, the research on Artificial Intelligence (AI) and in particular machine learning (ML) is expanding rapidly, which becomes the most salient focus during the past several decades. The aims of AI and ML are to facilitate systems with intelligence that is capable of humanlike learning and reasoning. These techniques possess tremendous advantages resulting in having been successfully applied in numerous industrial areas, including image classification, speech recognition, autonomous cars, computer vision, etc. With immense potentials, power electronics benefit from the development of AI and ML in their various applications. This includes design optimization of power module heatsink, intelligent control schemes for interconnected inverters at grid-edge, fault diagnosis and self-healing of power electronics, maximum power point tracking (MPPT), short/long-term forecasting of renewable energy conversion systems, anomaly detection and classification for network of inverters, etc. By implementing AI and ML, power electronic systems are embedded with capabilities of self-awareness and self-adaptability, and therefore, the system autonomy can be improved. The aim of the special section is to provide a timely opportunity for researchers, practicing engineers, and other stakeholders to share their latest discoveries in the areas of AI and ML applications in smart inverter/converter systems, in the context of the smart operational, control, and optimization solutions. Topics cover all areas of power electronics. Submissions need to demonstrate strong original contributions to these areas.

- ✓ AI and ML-based power electronics converter control.
- ✓ AI and ML applications for condition monitoring and fault detection and protection of power electronics converters.
- ✓ Grid connected renewable energy conversion systems with AI and ML.
- ✓ Application of AI and ML for reliability of smart converters.
- ✓ Fault detection and diagnosis of faulty switches and self-healing techniques.
- ✓ AI and ML-based design in power electronics encompassing topology selection, component sizing, circuit synthesis, reliability considerations.
- ✓ An autonomous DG controller using AI and ML approaches for volt-var control.
- ✓ AI and ML-based intrusion detection, classification, and event-triggered control for smart inverters.
- ✓ Cyber-physical security of power electronics based systems using AI and ML.

Manuscript Preparation and Submission

Check carefully the style of the journal described in the guidelines “Information for Authors” in the IEEE- IES website: <http://www.ieee-ies.org/pubs/jestie>. Please submit your manuscript in electronic form through: <https://mc.manuscriptcentral.com/jestie-ieee/>. On the submitting page, in pop-up menu of manuscript type, select: “**SS on AI and Machine Learning Applications in Smart Inverters**”, then upload all your manuscript files following the instructions.

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Timetable

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