

Special Issue

Renewable Energy Integration in Power Grids: Trends, Challenges, and Stability Advances

Message from the Guest Editor

The rapid integration of renewable energy sources, electric vehicles, and distributed energy resources (DERs) into modern power systems presents significant challenges for protection and control mechanisms. Traditional protection schemes, often based on fixed thresholds and centralized architectures, are increasingly inadequate in handling the complexity, variability, and cyber-physical interdependencies of today's smart grids. This Special Issue aims to explore the development and application of AI-driven multicriterial and adaptive systems that enhance the protection, monitoring, and control of modern power grids. We welcome original research and comprehensive reviews that focus on machine learning, deep learning, and data-driven methods, offering robust, real-time, and scalable solutions. Topics of interest include, but are not limited to, multicriterial decision-making in protection relays, adaptive fault detection and localization, federated learning for privacy-preserving grid analytics, and AI-powered control strategies for DER integration. Contributions related to Hardware-in-the-Loop (HIL) testing, and cyber-resilient system architectures are also encouraged.

Guest Editor

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Message from the Editor-in-Chief

Electronics is a multidisciplinary journal designed to appeal to a diverse audience of research scientists, practitioners, and developers in academia and industry. The journal is devoted to fast publication of latest technological breakthroughs, cutting-edge developments, and timely reviews of current and emerging technologies related to the broad field of electronics. Experimental and theoretical results are published as regular peer-reviewed articles or as articles within Special Issues guestedited by leading experts in selected topics of interest.

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