Special Issue

Artificial Intelligence for Next-Generation Solar Energy Systems

Message from the Guest Editors

This Special Issue invites original research articles and comprehensive reviews that push the frontier of AI-driven solar solutions. Key areas of interest include, but are not limited to, the following: · AI and ML applications for PV fault detection, diagnosis, and performance optimisation. · The integration of computer vision, deep learning, and multimodal frameworks for intelligent analysis of PV systems. · Large language models (LLMs) and hybrid approaches combining physics-based modelling with data-driven learning for enhanced decision-making. · Development of digital twins and real-time virtual representations of solar assets to improve design, monitoring, and predictive control. · Explainable AI (XAI) approaches that promote transparency, trust, and interpretability in solar system decision-making. · Edge and cloud-based AI systems enabling scalable, real-time analytics and management of distributed PV networks. By bringing together cutting-edge contributions from researchers and practitioners, this Special Issue aims to highlight how AI can accelerate the deployment, efficiency, and sustainability of solar technologies worldwide.

Guest Editors

Dr. Mahmoud Dhimish
Department of Electrical and Photonics Engineering, Technical University of Denmark, 4000 Roskilde, Sjælland, Denmark

Dr. Gisele Alves Dos Reis Benatto
Department of Electrical and Photonics Engineering, Technical University of Denmark, 4000 Roskilde, Sjælland, Denmark

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Energies
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
energies@mdpi.com

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Message from the Editor-in-Chief

Energies is an international, open access journal in energy engineering and research. The journal publishes original papers, review articles, technical notes, and letters. Authors are encouraged to submit manuscripts which bridge the gaps between research, development and implementation. The journal provides a forum for information on research, innovation, and demonstration in the areas of energy conversion and conservation, the optimal use of energy resources, optimization of energy processes, mitigation of environmental pollutants, and sustainable energy systems.

Editor-in-Chief

Prof. Dr. Enrico Sciubba
Department of Mechanical and Industrial Engineering, University Niccolò Cusano, 00166 Roma, Italy

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