Special Issue

Application of Machine Learning Tools for Energy Systems, 2nd Edition

Message from the Guest Editor

Following the success of the first edition of the Special Issue "Application of Machine Learning Tools for Energy Systems ", we are pleased to launch its second edition. Artificial Intelligence (AI) and Machine Learning (ML) are increasingly shaping the design, operation, and optimization of energy systems, supporting efficiency, reliability, and sustainability in the context of the global energy transition. Recent advances such as **deep learning, reinforcement learning, physics-informed neural networks (PINNs), digital twins, and foundation models** are opening new opportunities for data-driven and hybrid approaches. At the same time, the adoption of **explainable AI (XAI)**, **federated learning**, and **edge AI** is addressing critical issues of trust, privacy, and real-time control in smart energy systems. This Special Issue seeks to collect contributions that highlight both **innovative theoretical frameworks** and **practical implementations** of AI/ML in energy applications, ranging from renewable integration and demand response to electric mobility, storage, and resilient multi-energy systems.

Guest Editor

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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.

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