

Special Issue

Machine Learning for Building Performance: Modeling and Analysis for Building Assessment and Optimization

Message from the Guest Editors

Machine learning (ML) for building performance involves using advanced algorithms to analyze data and optimize energy efficiency, comfort, indoor environmental quality, and overall building operations. ML also ensures optimal indoor environmental quality by adjusting systems like HVAC and lighting based on occupancy, weather, and user preferences. It also aids in the design and retrofitting of buildings by simulating performance, recommending energy-saving upgrades, and optimizing renewable energy integration. These applications support the development of smarter, more adaptable buildings that balance energy use, comfort, indoor environmental quality, and building operations effectively. The benefits of implementing ML in building performance include significant cost savings, improved occupant comfort, and support for sustainability goals. This Special Issue aims to present recent advancements in building performance assessment and optimization through the application of machine learning modeling and analysis.

- Energy consumption forecasting;
- Anomaly detection;
- Data-driven modeling;
- Machine learning control;
- AI optimization;
- AI commissioning

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About the Journal

Message from the Editor-in-Chief

Current urban environments are home to multi-modal transit systems, extensive energy grids, a building stock, and integrated services. Sprawling neighborhoods are composed of buildings that accommodate living and working quarters. However, it is expected that the cities and communities of the future will face complex and enormous challenges, including maintenance, interconnectivity, resilience, energy efficiency, and sustainability issues, to name but a few. A smart city uses advanced technologies and a digital infrastructure to improve the outcomes in every aspect of a city's operations. A smart building optimizes the experience of occupants, staff, and management by using a modern and connected environment. Innovations in technology that can bring dramatic improvements to design, planning, and policy are critical in developing the cities and buildings of the future.

Editor-in-Chief

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