Special Issue

Artificial Intelligence in Material and Structural Optimization for Sustainable Infrastructure

Message from the Guest Editors

This Special Issue topics of interest include but are not limited to:

- AI-based structural design optimization for performance, cost, and sustainability.
- Data-driven materials design, selection, and multi-scale modeling.
- Topology and shape optimization of structural systems using machine learning and evolutionary algorithms.
- AI-assisted life-cycle assessment and embodied carbon minimization.
- Application of generative design and parametric tools for sustainable architecture and infrastructure.
- Integration of AI with digital fabrication and 3D concrete printing.
- Reinforcement learning and surrogate modeling in real-time structural optimization.
- Computational approaches for climate-resilient and adaptive infrastructure design.
- Case studies demonstrating AI-augmented optimization in bridges, buildings, pavements, or marine structures.
- Emerging trends, challenges, and ethical considerations in AI-driven engineering.

For further reading, please follow the link to the Special Issue Website at:
https://www.mdpi.com/journal/buildings/special_issues/F74XMF5448

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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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