Special Issue

Intelligent Optimization Algorithms and Computational Modeling in Civil and Structural Engineering

Message from the Guest Editor

Civil and structural engineering increasingly faces challenges in sustainability, resilience and digitalization, making intelligent optimization and advanced computational modeling essential. This Special Issue presents recent interdisciplinary advances in these areas. We welcome original research and reviews on innovative methods, including optimization algorithms (e.g., metaheuristics, genetic algorithms), computational modeling (e.g., FEM, DEM), machine learning techniques and intelligent construction technologies such as digital twins and automation. A core focus is methodological innovation. Submissions introducing new algorithms, theoretical frameworks, model-coupling strategies (e.g., physics-informed ML), efficiency improvements or new validation approaches are encouraged. Topics may include optimization, construction management, seismic resilience, infrastructure monitoring and life-cycle performance. This Special Issue seeks to link algorithmic development with practical engineering applications to advance intelligent and resilient built environments.

Guest Editor

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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.

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