Special Issue

Bionic Materials and Structures in Civil Engineering

Message from the Guest Editors

Bionic materials and designs offer innovative solutions for construction sustainability. Bionic structures enhance strength, adaptability, and energy efficiency by mimicking nature's principles. Examples include honeycomb panels inspired by bee and beetle structures, buildings mimicking ant mound cooling systems for airflow, polar bear-inspired insulation, and spider web-inspired cable-stayed structures. Despite their potential, challenges like scalability, cost-efficiency, and integration with traditional methods remain. This Special Issue will highlight advancements in bionic designs, materials, and optimization. We invite contributions on:

- Bionic Lightweight Components: Honeycomb beams, bio-inspired columns
- Bionic Surfaces & Coatings: Self-cleaning surfaces, anti-fouling materials
- Bionic Sensors: Damage detection, health monitoring
- Bionic Foundations: Root-like designs for stability
- Bionic Optical Structures: Nature-inspired lighting
- Bionic Algorithms & Intelligent Design: Nature-based optimization
- Sustainable Technologies: Energy-saving strategies, eco-friendly materials

Guest Editors

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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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