

Special Issue

Large Language Models and Multimodal AI for Next-Generation Building Information Modeling (BIM): From Conversational Agents to Immersive Design Collaboration

Message from the Guest Editors

The rapid evolution of artificial intelligence (AI), particularly large language models (LLMs), is revolutionizing how building information modeling (BIM) data is created, interpreted, shared and utilized throughout the lifecycle of built assets. BIM has become the central hub for information management in the architecture, engineering, and construction (AEC) industry, offering a rich foundation for embedding intelligent automation and human-AI collaboration. LLM-driven platforms are now enabling context-aware information retrieval, natural language interaction with design and construction data, automated compliance checking and immersive decision-making experiences through VR/AR environments. In parallel, the integration of LLMs with knowledge graphs, digital twins, robotics and multimodal interfaces is paving the way for autonomous design assistance, predictive planning and real-time construction monitoring. This Special Issue focuses on emerging research and advanced applications of LLMs in BIM—ranging from conversational AI agents and reasoning-enhanced data management to multi-agent collaboration and virtual co-design. We welcome high-quality contributions.

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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