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Sustainable and Resilient Infrastructure

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Building Infrastructure Better: Digitalisation, Decarbonisation and Decentralisation

Building infrastructure better is crucial for fostering sustainable development, enhancing economic growth, improving quality of life, and ensuring resilience against future challenges. It is not just about constructing physical structures; it's about creating systems that support economic prosperity, environmental stewardship, social equity, and technological advancement. It requires forward-thinking strategies, collaboration between stakeholders, and a commitment to excellence in infrastructure conceptualization and development. The built environment faces unprecedented challenges and opportunities. Technological advancements, mounting environmental concerns, and shifting socio-economic dynamics are converging to redefine the paradigms of infrastructure development and management. This special issue seeks to provide an interdisciplinary forum to explore the synergistic potential of digitalisation, decarbonisation, and decentralisation in shaping the future of infrastructure. This special issue welcomes critical studies that examine integration of advanced digital tools in revolutionising the construction and infrastructure sectors. Innovations such as Building Information Modelling (BIM), digital twins, Internet of Things (IoT), and artificial intelligence are transforming every phase of a project—from design and planning to construction and operation. The imperative to reduce greenhouse gas emissions and mitigate climate change is driving a global shift towards sustainable practices in the built environment. Decarbonisation strategies—ranging from the adoption of low-carbon materials and net-zero energy building designs to renewable energy integration and circular economy principles—are at the forefront of this movement and critical to building infrastructure better. Traditional, centralized models of infrastructure are increasingly giving way to more distributed, resilient, and community-oriented approaches. Decentralised solutions, such as microgrids, modular construction methods, adaptive reuse of existing structures, and community-driven planning, offer promising pathways to enhance local autonomy and foster sustainable urban and rural development. Submissions that explore the technical, economic, and social dimensions of decentralised infrastructure, as well as its role in empowering local governance and enhancing urban resilience, are particularly encouraged.

We invite original research articles, comprehensive review papers, case studies, and conceptual analyses that address any or all of the themes outlined above. Submissions should offer insights that not only advance the theoretical and practical understanding of digitalisation, decarbonisation, and decentralisation in infrastructure but also foster innovative solutions for building a more resilient and sustainable future.

- Submissions should adhere to the journal's standard guidelines
- All manuscripts will undergo rigorous peer review to ensure high-quality scholarly contributions.
- Notification of acceptance and final manuscript deadlines will be communicated according to the journal's timeline

We encourage contributions from researchers, practitioners, policymakers, and industry leaders. This special issue aspires to catalyse meaningful dialogue and cross-disciplinary collaboration, ultimately contributing to the development of innovative strategies and policies for building infrastructure that is better, smarter, and more sustainable.

Subject Areas:

Digitalisation in Infrastructure

- Building Information Modeling (BIM) and Digital Twins
- Internet of Things (IoT) and Sensor Technologies
- Artificial Intelligence and Machine Learning Applications
- Augmented Reality (AR), Virtual Reality (VR), and Immersive Technologies
- Blockchain and Cybersecurity in Construction
- Human-robot Teams in Infrastructure Development
- Resilient and Responsive Infrastructure

Decarbonisation Strategies

- Sustainable Materials and Low-Carbon Technologies
- Net-Zero Energy Buildings and Renewable Integration
- Life Cycle Assessment (LCA) and Carbon Footprint Analysis
- Circularity and the built environment
- Sustainable Urban Drainage systems

Decentralised Infrastructure Solutions

- Distributed Energy Systems and Microgrids
- New and innovative business models for clean energy
- Modular and Prefabricated Construction Methods
- Community-Driven Infrastructure and Local Governance
- Adaptive Reuse and Retrofitting of Existing Structures
- Smart Cities and Distributed Urban Systems

Submission Instructions

Authors are invited to submit their papers through the Submission Portal indicating the Building Infrastructure Better: Digitalisation, Decarbonisation and Decentralisations Special Issue.

The introduction should clearly indicate the extended state of the art review over the paper published in the conference proceedings ofthe 11th International Conference on Infrastructure Development and Investment (DII) **https://www.uj.ac.za/wp-content/uploads/2025/01/dii-2025_call-for-papers.pdf.** and refer to this paper.

Submission Deadlines:

Deadline for submission: **1st August 2025**

Deadline for review: **30th September 2025**

Deadline for revised submission: **3oth October 2025**

Deadline for approval final manuscript: **30th November 2025**

INSTRUCTIONS FOR AUTHORS **SUBMIT AN ARTICLE**

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