International Council for Research and Innovation in Building and Construction

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Innovative Information Technology in the Built Environment

CIB Student Chapters Collaborative Research Seminar

Date: Wednesday, 04 August 2021
Time: 4 pm (NZT), 2 pm (AET), 12 pm (HKT)
Duration: 90 mins
MS Teams

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Real-Time Delay Management System: A Combined IoT-Based Data Fusion Model For Automated Smart Construction Progress Tracking

Cost overrun and schedule delays are common problems, frequently leading to disputes and costly claims in construction projects' delivery. Hence, using real-time IoT based progress tracking systems in the construction industry is essential for effective smart construction projects management. This research presents workflows to develop a data acquisition framework (timely tracking/ productivity assessment and a developed Integrated Management System to improve accuracy, reliability and fast accessibility. It includes evaluating possible data sources, technologies, tracking, and management systems and developing a hybrid model for data acquisition and fusion.

Developing a Blockchain-Based Post-Contract Work and Payment Certification Framework for Construction Projects

This research aims to develop a blockchain-based framework to evaluate the certification of quality and progress of completed work and related payments in construction projects. Blockchain provides a secure, decentralised electronic ledger, prevents unauthorised data manipulation, and presents an audit trail of activities. The research outcomes will be an integrated data model for the certification process, a rating system, and a blockchain prototype. This framework is expected to incentivise compliance in the built environment, thereby reducing significant building failures.

Public and private blockchain in construction business process and information integration

Blockchain technology has great potential to facilitate business activities of building projects in the construction industry. Nevertheless, the construction industry still stays behind the other industries in adopting blockchain. The aim of this study is to explore the feasibility of applying both public blockchain and private blockchain in the construction industry. The business processes of two construction projects were selected as the cases to drive the blockchain-based architecture design. The proposed architectures were demonstrated using Hyperledger Fabric and Ethereum. This research provides insights regarding the adoption of blockchain technology, especially in construction industry.

CIM-enabled quantitative view assessment in architectural design and space planning

A view is among the critical criteria in an architectural design process. Presently, it tends to be assessed manually from site observation to data analysis. City Information Model (CIM), with its capabilities to analyze built-environment view information, gains a great potential to increase the automation. However, the CIM-based view assessment has not integrated with architectural space planning in either research or practice. This research, therefore, aims to develop a model through which CIM can be extended to assist view assessment in architectural space planning.

Visualize GIS, BIM and IOT data for comprehensive green building parameters monitoring

Current green building projects lacks an effective visualization system containing multiple sources of data for monitoring and management. The research presents a novel approach integrating GIS, BIM and IoT data for visualizing Indoor Environment Quality (IEQ) parameters and ameliorating the decision-making process during asset operational phase. The prevailing green building standards like LEEDS are surveyed and essential parameters are summarized. Moreover, a new pipeline integrating GIS, BIM and sensor data is proposed to collect, transmit and visualize the required parameters.