CIC Project Spotlight

CONSTRUCTION-ORIENTED DIGITAL TWINS FOR MULTI-DIMENSIONAL PROJECT PLANNING AND CONTROL

Duration: 5 years
Budget: $495,000/year

The aim of this research is to develop a multi-dimensional approach to construction planning and control that simultaneously addresses multiple focus areas of construction management, and provides seamless integration of as-built data with project plans.

Industry Challenge

Process methodologies across the different focus areas of construction management (cost, schedule, quality, resources, risk, safety) tend to be incompatible, and the limitations of current planning practices often lead to ineffective project performance forecasting and unachievable plans. The successful implementation of advanced strategies like Industry 4.0 requires the successful integration and analysis of data across multiple focus areas.

Research Approach

Using the techniques of digital twin technology and Industry 4.0, CIC researchers seek to improve the collection of sensor-based, real-time, as-built project data, and to enhance synchronization of that data with original project plans. Research activities will run in parallel, each focusing on data collection and the development of a deliverable standalone solution to a specific planning and control challenge (such as Takt schedule compliance, work-package risk assessment, and waste reduction). These solutions will later be integrated into a larger **multi-dimensional framework to improve decision-making and project control and forecasting**.


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Deliverables

Deliverables will include six combinable decision-support frameworks and an integrated multi-dimensional approach for enhanced construction planning and control. Training materials, user manuals, technical summaries, installation manuals, and training sessions will also be developed and provided as needed.

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