

## Faculty of Engineering

### Summer Research Program 2022-2023

Project Title: Digital Twinning Crane Operations for Coordinated Site Logistics in Modular integrated Construction (MiC)

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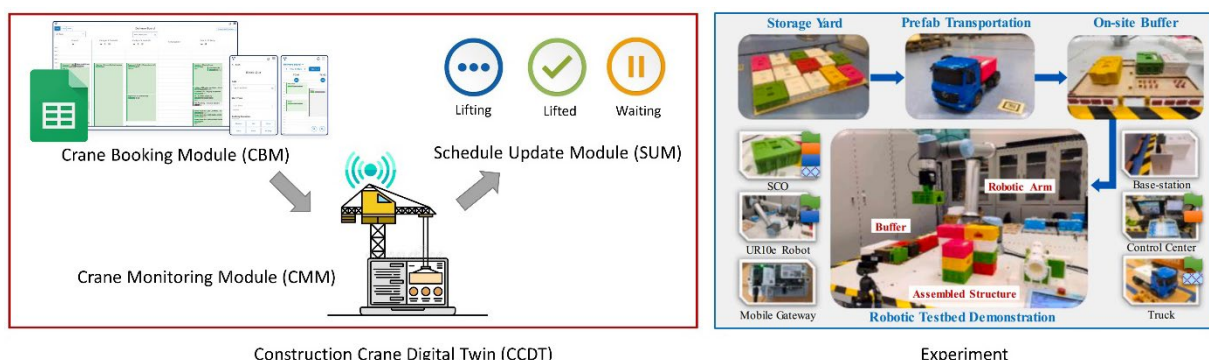
Website profile of project supervisor: <https://www.monash.edu/engineering/yihaifang>

### Objective

To create a digital twin for construction cranes that records the demands for crane lifting, tracks cranes' behaviour and updates the progress of lifting operations and crane availability in real-time.

### Project Details

Modular integrated construction (MiC) has become increasingly prevalent, owing to improved productivity and reduced waste. As an innovative construction method, it shifts a large number of construction activities away from construction sites to off-site manufacturing plants for better productivity, safety, and sustainability performances. In this case, construction cranes gain unprecedented importance on-site, dominating site logistics and determining the efficiency of on-site construction activities. Thus, creating a digital twin for construction cranes is in imperative demand. This project will develop a digital twin that consists of three modules: Crane Booking Module (CBM), Crane Monitoring Module (CMM), and Schedule Update Module (SUM). A robotic arm will be used to simulate a crane to validate the digital twin in a lab environment. Students on this project are anticipated to acquire knowledge on MiC, digital twin, and sensing technologies, as well as gain hands-on experience with robotics systems.



### Prerequisites

Students with programming skills is preferred (regardless of language used)

### Additional Information

Applicants may be required to attend an interview.