



香港大學  
THE UNIVERSITY OF HONG KONG



香港大學建造及基建創新研究中心  
CENTRE FOR INNOVATION IN CONSTRUCTION AND  
INFRASTRUCTURE DEVELOPMENT



MiCLab  
The University of Hong Kong

Department of Civil Engineering  
The University of Hong Kong

Centre for Innovation in Construction  
and Infrastructure Development

Modular Integrated Construction  
Laboratory

## SEMINAR

Jointly organized by  
**Department of Civil Engineering, CICID and MiCLab, HKU**

### **Leveraging Advanced Simulation, Modeling, and Analysis Techniques for Sustainable, Resilient, and Smart Infrastructure Design and Optimization**

**Dr Jürgen Hackl**

Assistant Professor, Department of Civil and Environmental Engineering, Princeton University, US

Date: August 7, 2024 (Wednesday)

Time: 11:00 a.m. – 12:00 n.n.

Venue: Room 612B, 6/F Haking Wong Building, The University of Hong Kong

#### **Abstract**

Our modern life becomes more and more dependent on the intricate web of critical infrastructure systems. Infrastructure systems provide functional necessities, such as transportation, energy and telecommunication, but they also make cities more livable, increase the quality of life and support productivity and prosperity. However, infrastructure systems often encounter global and regional challenges such as rapid urbanization, climate change and limited resources, as well as the fact that many assets are coming to the end of their lifespan. To solve these challenges, advances in simulation, modelling and data analysis techniques combined with High-Performance Computing offer potential new opportunities to design and optimize sustainable, resilient and smart infrastructures. This presentation aims to give an overview of how complex infrastructure systems are currently modelled; how we can utilize novel network analytic methods for spatial-temporal networks to gain a better understanding of our complex urban environment; how advances in data analytics and machine learning provide us with new ways to extract knowledge and support decision-making processes; as well as how cloud-based simulations might offer a solution for computational risk and resilience assessments of complex infrastructure systems.

#### **About the Speaker**

Dr. Jürgen Hackl is an Assistant Professor for Complex Infrastructure Systems at the Department for Civil and Environmental Engineering at Princeton University. He obtained his doctorate from ETH Zürich, Switzerland. After finishing his doctorate, he was a senior researcher at the Department of Computer Science at the University of Zürich from 2019 to 2022. In 2020, he was appointed as an Assistant Professor at the University of Liverpool, focusing on urban risk and resilience assessments. In 2022, he joined the University of Cambridge as a Research Assistant Professor for Digital Twins. His research focuses on complex infrastructure systems, intelligent risk and resilience assessments to climate change, as well as integrated solutions to future challenges facing our cities and society.

- ALL ARE WELCOME -