RESEARCH SEMINAR

DEPARTMENT OF GEOGRAPHY & RESOURCE MANAGEMENT
THE CHINESE UNIVERSITY OF HONG KONG

Digital Twins of Cities - What are they? What should they be?

30th October 2025 (Thu)
4:30 – 6:00 pm (UTC+8)
Yasumoto International Academic Park (YIA), LT2

"Digital twins of cities" is becoming a catchword in geographical research and urban studies. To avoid jumping on the bandwagon without a thorough understanding of what it means and what it takes to address the genuine needs in our investigations, this seminar targets the nature and necessity of developing digital twins for urban analysis and planning. I argue that the current emphasis on information technologies and digital representations of cities is a lopsided effort in the construction of digital twins of cities. It falls short in developing a paradigm instrumental in bringing urban theories, particularly on urban dynamics and complexity, into the modeling, simulation, prediction, and practical management of our ever-evolving dynamical complex urban systems. The talk introduces a general framework for the learning and incorporation of urban dynamics and complexity into digital twins of cities to ensure that models closely capture the underlying processes that govern the development of cities throughout their life cycles and can be dynamically updated according to new information, and data can be made theory-informed and dynamically collected and updated to better empower our analysis and decision making in urban development and control. The framework lays the foundation for the construction of novel digital twins of cities for the advancement of urban science and practical applications via interdisciplinary collaboration involving academia, practicing professionals, industry, and government. The conceptual arguments will be substantiated by real-life urban phenomena and processes.

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Yee Leung is a pioneer of the theory and applications of fuzzy sets approach to geographical research and has done novel research on uncertainty analysis in geographical modeling and spatiotemporal information using probability, statistics, fuzzy set, rough set and granular computing. His research also covers artificial intelligence in general and machine learning, deep learning, neural network, evolutionary computation, and optimization, particularly their applications in geographical analysis. He has published six monographs and over 200 articles in reputed international journals mainly in geography, geographical information science, artificial intelligence, computer science, and information science.

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