香港科技大學
THE HONG KONG UNIVERSITY OF SCIENCE AND TECHNOLOGY

土木及環境工程學系
DEPARTMENT OF CIVIL AND ENVIRONMENTAL ENGINEERING

SEMINAR

INVERSE LEARNING OF USER EQUILIBRIUM

Speaker

Prof. Yafeng Yin

University of Michigan, Ann Arbor

Abstract

This talk introduces an inverse learning framework for constructing traffic network equilibrium models directly from empirical observations. Using trajectory, volume, and speed data, the framework estimates link performance, route choice preferences, and demand functions without costly local surveys. Recent advances include learning route choice preferences from trajectory data with perturbed utility theory and developing context-dependent equilibrium models from multiday traffic data that incorporate features such as weather and day of week. These methods improve predictive accuracy and scalability while balancing behavioral interpretability and data fit. The framework also supports planning and policy analysis under uncertainty, demonstrating the potential of inverse learning to make network modeling more data-driven, adaptive, and practical for real-world applications.

Biography

Dr. Yafeng Yin is the Donald Cleveland Collegiate Professor of Engineering and the Donald Malloure Department Chair of Civil and Environmental Engineering at the University of Michigan, Ann Arbor. His research examines the interactions among travelers, infrastructure, and mobility services, aiming to enhance the design, operation, and regulation of transportation systems. He has published over 160 peer-reviewed papers in leading journals and served as Editor-in-Chief of Transportation Research Part C: Emerging Technologies from 2014 to 2020. He currently serves as an Area Editor for Transportation Science and an Associate Editor for Transportation Research Part B: Methodological, and co-Editor-Chief for the newly launched journal Artificial Intelligence for Transportation. Dr. Yin's work has received multiple honors, including the Monroe-Brown Foundation Education Excellence Award from Michigan Engineering, the Doctoral Mentoring Award from the University of Florida, and the Outstanding Leadership Award from the Chinese Overseas Transportation Association (COTA). He has also received several best paper awards from the Transportation Research Board, including the Stella Dafermos, Ryuichi Kitamura, and Kikuchi-Karlaftis awards. He earned his Ph.D. from the University of Tokyo in 2002, and his master's and bachelor's degrees from Tsinghua University in 1996 and 1994, respectively.

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Room 3584A (Lift 27/28), Academic Building, HKUST

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