

DEPARTMENT OF CIVIL ENGINEERING
SEMINARJOINTLY ORGANIZED WITH
HONG KONG SOCIETY FOR TRANSPORTATION STUDIES
INSTITUTE OF TRANSPORT STUDIES, HKU**Integrated optimization of bus bridging service design and passenger assignment
in response to urban rail transit disruptions**

Associate Prof. Yu Zhou

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Date: November 9, 2023 (Thursday)

Time: 10:00 a.m. – 11:00 a.m.

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

Abstract

As the urban rail transit (URT) system plays an increasingly important role in supporting large cities' mobility around the world, service disruptions have become more prevalent, potentially resulting in severe economic losses and passenger safety issues. It is imperative to investigate effective response strategies to mitigate the effects of such disruptions. In response to URT service disruptions, this paper systematically investigates the bus bridging service design (BBSD) problem, which concerns the integration of bus bridging route design, frequency determination, and passenger assignment in the integrated URT and bus network. The problem is formulated as a path-based integer linear programming (ILP) model with the goal of simultaneously minimizing operator-oriented and passenger-oriented costs. A column generation-based approach is proposed to solve this model efficiently, allowing nonintuitive bus routes to be freely generated on the network dynamically. Our method has been tested with two different case studies based on real data from the Hong Kong Mass Transit Railway (MTR). Experiments demonstrate that our proposed approach can assist public transit (PT) operators in developing efficient emergency response plans for various potential disruption situations in advance. Even in the face of unexpected disruptions that necessitate a quick response, our approach can generate high-quality solutions in a matter of minutes.

About the Speaker

Dr. Yu Zhou is about to join the School of Transportation Science and Engineering, Beihang University as an associate professor. Dr. Zhou's research interests include (i) public transportation operations and management, (ii) future mobility and (iii) multimodal transportation. Dr. Zhou dedicated his research efforts to addressing fundamental and cutting-edge issues in the field of transportation. His rigorous studies have culminated in the publication of over 30 papers in internationally renowned SCI journals and academic conferences. Notably, Dr. Zhou has taken the lead role, as either the first or corresponding author, in publishing 14 papers in prestigious SCI-indexed journals, including Transportation Research Part B, Part C, Part D, European Journal of Operational Research and Applied Energy. Beyond his published work, Dr. Zhou has actively contributed to the discourse within the global transportation community. He serves as the editorial member of Digital Transportation and Safety. In addition, Dr. Zhou has also been invited to peer review for over ten international journals and top-tier transportation conferences. These include but are not limited to Transportation Science, Transportation Research Part B, Part C, Part D, Part E, Accident Analysis and Prevention, and Computers & Operations Research. He is also a reviewer for prestigious conferences in the transportation field, like the International Symposium on Transportation and Traffic Theory (ISTTT) and TRB meetings.

- ALL ARE WELCOME -