Mini-Workshop "Big Data and Transportation Dynamics"

東京大学　空間情報科学研究センター　日下部研究室

科学研究費　若手(A)「交通系センサーネットワークデータを用いた動的交通システムモデルの構築」による支援のもと,交通データ×動的交通解析に関する国際Mini-Workshop "Big Data and Transportation Dynamics"を英国リーズ大学の Ronghui Liu 先生をお招きして開催します．ご興味がある方はぜひご参加ください.

日時：2018 年 3 月 19 日（月) 13:30-16:30 (13:15 開場)
場所：TKP ガーデンシティ御茶ノ水のカンファレンスルーム 2D
地図：https://www.kashikaigishitsu.net/facilitys/gc-ochanomizu/access/
※席が限られています．ご参加をご希望の方は peatix にてお申込みください.
申込 URL: https://wbdtd2018.peatix.com/

プログラム：

13:30 - 14:00 Opening (Introduction of the project)
Dr Takahiko Kusakabe
Assistant Professor
Spatial Infromation Science Center, the Universiy of Tokyo

14:00 - 14:30 "Application of Activity-Besed Simulator MATSIM for Tokyo Metrpolitan Area"
Dr Takuma Mitani
Project Assistant Professor
Spatial Infromation Science Center, the Universiy of Tokyo

14:30 - 15:00 "Day-to-day dynamics of ridesharing system based on user rational behavior".
Dr Phathinan Thaithatkul
Project Researcher
Spatial Infromation Science Center, the Universiy of Tokyo

15:05 - 15:30 "Intentional Removals of Nodes and Links to Avoid Gridlock"
Mr Kashin Sugishita
Doctoral candidate
Tokyo Institute of Technology

15:30 - 15:55 "Departure Time and Mode Choice in Urban Cities with Bottleneck Congestion and Crowding Cost"
Mr. Takao Dantsuji
Doctoral candidate
Tokyo Institute of Technology

15:55 - 16:30 "Considering Overtaking and Passenger Boarding Behaviour in Bus Holding to Reduce Bus Bunching"
Dr Ronghui Liu
Associate Professor & Director of International Activities
Institute for Transport Studies, University of Leeds

International guest speaker:

Dr Ronghui Liu

Associate Professor & Director of International Activities

Institute for Transport Studies, University of Leeds

Short Bio:

Dr Ronghui Liu is an Associate Professor and the Director of International Activities at the Institute for Transport Studies (ITS), University of Leeds, UK. She received her BSc from Peking University and PhD from Cambridge University. Before joining ITS Leeds, she was a Research Fellow at University College London, and while at ITS, she was seconded to head the Transport Modelling Division at TRL, UK in 2005. She served as an Associate Editor for journal IEEE Transaction on Intelligent Transportation Systems, and Member of Editorial Board of IET Journal of Intelligent Transport. Her research areas span a number of themes in the field of transport studies: in vehicle dynamics and traffic microsimulaton model developments; in traffic control theory and algorithms; in travel behaviour and Intelligent mobility; in stochastic models and reliability analysis; in public transport operations and controls; in timetabling and schedule coordination; and in train control and railway traffic management systems. She is particularly interested in the interrelationships between these themes, and methodologies for estimation, design and evaluation of their network-wide effects.

Presentation Title: Considering Overtaking and Passenger Boarding Behaviour in Bus Holding to Reduce Bus Bunching

Headway fluctuation and "bus bunching" are well-known phenomena on many bus routes. Bus bunching occurs where one bus is delayed at upstream stops due to unplanned high boarding demand, or being delayed en-route by unforeseen traffic congestion. The subsequent service then has to pick up fewer passengers at that stop and departs earlier than scheduled. At downstream stops the effect is than emphasised as the initial delay to the first vehicle and the early arrival of the subsequent service result in increasingly longer dwell times for the first bus and increasingly shorter dwell times for the second bus.

Bus holding control is a real-time control strategy used to reduce bus bunching. The holding control works by keeping buses adhere to a scheduled timetable and/or to a regular headway. In this talk, we consider the influence of bus driving behaviour and passenger boarding behaviour on the bus holding control and on bus bunching. We propose: (a) a distributed passenger boarding (DPB) behaviour to model the dynamic distribution of passengers, taking account of bus bunching at stops and bus capacity constraints; and (b) a first-depart-first-hold strategy for bus holding control. We show that when the combined overtaking and queue-swapping behaviour are considered, the proposed control strategies allowing for bus overtaking and DPB behaviour lead to better headway regularity, less passenger waiting time and less on-board travel time than when overtaking and DPB are not considered. We show that the benefit is even greater when travel time variability is higher and headway is smaller, suggesting that the control strategies are preferably deployed in high-frequency service.