Spatial and Temporal Constrained Compressive Sensing of Floating Car Data for Short-term Urban Traffic Forecasting

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Room 829, Knowles Building
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Abstract:
Traffic congestions strongly undermine the effect of urban transport systems to promote development of cities. Instead of building new infrastructures, city planners can also turn to the emerging technologies to manage travel demand better and also make more efficient use of current transport systems.

Recently probe vehicles such as taxi cabs installed with GPS receivers are widely deployed on urban road networks all over the world. Researchers utilize such kind of floating car data (FCD) from probe vehicles to monitor urban transport systems and forecast future traffic conditions.

However, literature shows that most of the traffic forecasting models using FCD are based on high sampling scenarios while in real world practices the FCD coverage in space and time is relatively low. Thanks to the merits of compressive sensing theory in signal processing dealing with sparse signal, this study proposes an adapted compressive sensing approach to carry out short-term forecast on urban traffic speed which takes spatial and temporal properties of traffic data into consideration.

About the Speaker:
LAN Tian is a Ph.D. student in the Department of Urban Planning and Design. He finished his undergraduate study at Wuhan University and later received his master degree from the State Key Laboratory of Information Engineering in Surveying, Mapping and Remote Sensing at Wuhan University. He has participated in several projects such as the “Hong Kong Tram Trail” LBS application to celebrate HKU’s 100th anniversary. His research interests revolve around geographic information system (GIS), GIS for urban planning and transportation and traffic data processing.

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