

SEMINAR NOTICE:



Transportation Activity Analysis using Smartphones

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**Friday, April 20 at
11 a.m.
CSL 301**

Abstract:

Transportation activity surveys investigate when, where and how people travel in urban areas to provide information necessary for urban transportation planning. Such surveys are conducted through conventional questionnaires and travel diaries. However, the conventional surveys are problematic and error-prone. We are developing a smartphone-based transportation activity survey system to replace the traditional surveys. The smartphones are used to collect GPS, GSM, accelerometer and other contextual information for place detection, trajectory tracking and transportation mode detection. Our smartphone based survey system is designed to seamlessly capture the daily transportation activity profiles of users, including their modes of transportation and places they visit.

In this talk, we will discuss the design and implementation of the transportation activity survey system. We present the design of the mobile applications, based on the Android and iOS platforms, to improve the quality of the sensing data and reduce the energy required for data collection. We give an overview of the survey web application to enable users to validate their activities and trips. We highlight the design of the high-performance backend server for managing and processing the huge volume of sensor data, and its preliminary performance and scalability analysis. We also present the data analysis techniques for stop detection and transportation mode detection. A full prototype of the system has been developed and is under pilot testing by real users.

Biosketch:

Hock Beng Lim is the Director of Research and Development of the Intelligent Systems Center at Nanyang Technological University, Singapore. He received his B.S. in Computer Engineering, M.S. in Electrical Engineering, and Ph.D. in Electrical and Computer Engineering from the University of Illinois at Urbana-Champaign, and his M.S. in Management Science and Engineering from Stanford University. His research interests include sensor networks and sensor grids, cyber physical systems, cloud computing, parallel and distributed computing, wireless and mobile networks, computer architecture, embedded systems, performance evaluation, e-Science and high-performance computing.