T2CBS: Mining Taxi Trajectories for Customized Bus Systems

**Speaker**  
Miss Yan LYU  
PhD Student  
Department of Computer Science  
City University of Hong Kong  
Hong Kong

**Date**  3 May 2016 (Tuesday)  
**Time**  10:30 am - 11:00 am  
**Venue**  CS Seminar Room, Y6405, 6th Floor  
Yellow Zone, Academic 1  
City University of Hong Kong  
83 Tat Chee Avenue  
Kowloon Tong

**Abstract**

A customized bus (CB) system is a new emerging public transportation that provides flexible demand-oriented transit services for city commuters. Existing CB systems encounter two challenges of 1) collecting travel demands and discovering travel patterns effectively and efficiently and 2) planning profitable bus lines based on travel patterns. In this paper, we propose a bus line planning framework, called T2CBS, by taking full advantage of taxi trajectory data. In T2CBS, similar travel demands are discovered from passenger trajectories with a clustering algorithm, and CB stops are deployed at pick-up and drop-off points of trajectory clusters with integer linear programming. To plan profitable CB lines, we propose a profit estimation model, by considering the number of taxi passengers who can be attracted to CB buses. A routing algorithm (CBRouting) and a timetabling algorithm (CBTimetabling) are proposed to generate a CB line that can achieve the maximum profit for each trajectory cluster. We conduct experiments on one-month taxi trajectory data in Nanjing, China. Experimental results demonstrate that our T2CBS can generate CB lines with higher profit compared with baseline methods, and the moderate increase in travel time along the CB lines is significantly dominated by the savings in bus fare.

This paper was presented at the 2nd IEEE INFOCOM Workshop on Smart Cities and Urban Computing, April 11, 2016, San Francisco, CA, USA.

Supervisors: Dr LEE Chung Sing Victor and Dr CHOW Chi Yin Ted

Research Interests: Data Mining, Spatio-temporal Data Analytics, Mobile Computing, and Location-based Services

All are welcome!