Constructing Activity-Mobility Patterns of Students Based On UB (University at Buffalo) Card Transactions

Activity-mobility patterns have been widely used to represent the movement of traveling entities in time and space. In previous studies, researchers generated various mobility patterns using a broad range of positioning technologies such as Global System Mobile, Global Positioning System, traffic sensors and smart phone data. In this research, we propose to use UB cards as a convenient source of data in order to define a UB campus-wide model for students' activity-mobility patterns generation in time-space dimension

A UB Card is a student's official ID at the University at Buffalo and is used across campus for various reason including Stampedes (on-campus bus system), facilities access, dining and shopping. Therefore, it could be a reliable source of data to identify time, location and activity types of individual students.

The research project has two different stages. In the first stage, we develop algorithms to construct students' continuous paths in space-time dimension using a set of UB card transaction data points as input. The base algorithm will construct of activity-mobility patterns with no prior knowledge. The modified algorithm will construct activity-mobility patterns with prior knowledge of students' prior pattern as they have similar patterns for certain days of the week.

In the second stage, a survey will be conducted to provide detailed information of students' daily activity participation and travel decisions. Based on the survey data, the algorithm results will be compared to analyze the performance of the algorithms.

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1. Student Skill-Set Needed: survey design; algorithm design; data management; big data; programming
2. Compensation: Academic Credit, Volunteer, Work Study
3. Available: Fall, Spring, Summer

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