



## Summer Program on Transportation Statistics August 14-18, 2017

**Lecture:** *Trajectory-based Regression Approach to Predict Real-Time Traveler Information Using Crowdsourced Location Traces*

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**Abstract:**

Advanced traveler information systems (ATIS) are increasingly being deployed as a way to address the congestion issues faced by transportation systems. Traditionally, information in ATIS solutions is collected using physical sensor networks which are prohibitively expensive to install, costly to maintain and operate, limited in their coverage and suffer from unreliability. In an effort to overcome these challenges, crowdsourcing based solutions are increasingly being deployed that combine technological advances with new paradigms of information sharing to collect data. In crowdsourcing-based ATIS, users equipped with location-aware and data-enabled portable devices collect and share information. However, despite growth and promise of crowdsourcing-based ATIS, number of issues about its feasibility and applicability remain. A critical challenge with crowdsourcing is that the data collected is incomplete as it only provides information about subset of links from the entire network. This is primarily because at any given moment, users in a region are not traversing all links. Further, even if users traverse all links, only a small portion of those users participate in crowdsourcing solutions. In this presentation, a trajectory based regression technique that combines incomplete data (about travel conditions on a subset of links afforded by crowdsourced solutions) to predict traveler information for the entire transportation network will be presented. The methodology is demonstrated by utilizing location traces of shuttles serving the University of Connecticut to predict estimated arrival time for any given origin-destination pair. Further, robustness of the methodology is presented by varying the coverage and sampling frequency of the location traces.