

Seminar Talk

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Tuesday, January 23, 2018
3:00 p.m. KH 224

Title: En Route To Smart Cities: Mobility-Aware Rehash of Cameras and Sensors for Smart Intersections

Abstract:

Modern cities are alive with sensors, such as smartphones, wearables, vehicles, and cameras. Realizing our plans for smart cities of the future necessitates a radical transformation in the way these devices perceive and interact with our highly mobile urban environments. Smart city services are dependent on large-scale and low-cost data acquisition. To achieve this, we rehash these city-wide devices in an attempt towards developing a mobility-aware multimodal sensing framework. Cities contain many moving objects and we show that being aware of this mobility enables efficient sensor reuse even when monitoring moving objects/people. Such a synergy has the potential to change the way our cities function; from optimizing transportation to provisioning city services, and further to legal and economic framework, and regulations. My research leverages existing ubiquitous devices and expands their role to innovate new services, ranging from large-scale video analytics to pedestrian safety.

We innovate on smartphone sensors and fitness trackers for in-street detection. Through unobtrusive in-the-wild sensing we gauge pedestrian risk and enable city-scale pedestrian safety services. Infrastructure cameras, often mounted for surveillance and traffic monitoring, are among other prevalent devices in our cities that are underutilized. We devise mobility-aware scheduling for steerable infrastructure cameras to capture views for multiple concurrent analytics applications. We show how commonplace sensors can be used beyond their intended purpose. In building a framework involving widespread heterogeneous sensors and mobility-awareness, we introduce new avenues for smart city analytics.

Bio:

Shubham Jain is an Assistant Professor in the Department of Computer Science at Old Dominion University. Her research interests lie in mobile computing, cyber-physical systems, and data analytics in smart environments. She received her PhD in Electrical & Computer Engineering from Rutgers University in 2017. Her research in pedestrian safety received the Large Organization Recognition Award at AT&T Connected Intersections challenge, and has featured in various media

outlet including the Wall Street Journal. She also received the Best Presentation Award at PhD Forum, held with MobiSys 2015. She has interned at Microsoft Research, Redmond and General Motors Research. She has published in venues such as ACM MobiSys, ACM/IEEE IPSN, IEEE PerCom etc.