



Northwestern University Transportation Center presents:

Big data to tackle Urban Mobility Challenges

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ABSTRACT:

Urban mobility models are important in a wide range of application areas. Current mainstream models require socio-demographic information from costly manual surveys, which are in small sample sizes and updated in low frequency. In this study, we propose a novel individual mobility modeling framework, TimeGeo, that extracts all required features from ubiquitous, passive, and sparse digital traces in the information age. Combining demographic data, road network information and billions of mobile phone records, we infer travel demand profiles and estimate travel times across five different cities. We demonstrate that the percentage of time lost in congestion is a function of the proportion of vehicular travel demand to road infrastructure capacity, and is closely tied to spatial density and selfish choices of drivers. In this context we explore the feasibility of smart routing applications during mega events.

SPEAKER BIO:

Marta Gonzalez is an associate professor of Civil and Environmental Engineering of the Massachusetts Institute of Technology; she has joint appointments in the Center for Advanced Urbanism at MIT and the Engineering Systems Division. She joined MIT in July of 2009 after a postdoc in the Barabasi Lab and her PhD in Computational Physics from the University of Stuttgart in Germany (2006). Her research interests are focused on the analysis of vast data collections gathered from different human-driven activities and the formulation of models that elucidate the underlying principles of the observed scenarios. Marta has more of 6.5k citations and an h-index of 27. She is area editor of the IEEE Big Data journal and organizer of the satellite Workshops in Urban Systems both at the NetSci and CCS. She leads various projects with direct impact in cities funded by governments and industry. Marta's work pioneers urban scale models that inform decisions towards better cities, which look for alternative modes of transportation or more sustainable energy usage.