



Transportation Seminar Series

Friday, August 28, 2009

4 - 5 p.m. in 212 O'Brien Hall

(Location is subject to change)

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Off-line and On-line Calibration of Dynamic Traffic Assignment Systems

Abstract: Demand and network supply simulation models to estimate current traffic conditions, predict future network performance and generate consistent, anticipatory route guidance. Before they are applied, DTA system parameters and inputs must be calibrated to accurately reflect travel behavior and traffic dynamics. In this talk, a systematic approach that unifies the off-line and on-line calibration of DTA systems through a common framework is presented. Off-line calibration simultaneously estimates demand and supply model parameters. The on-line calibration jointly updates—in real-time—the demand and supply parameter values estimated during the off-line step to better reflect prevailing conditions. The methods are general and can utilize any available traffic surveillance information (including emerging data sources, such as Automated Vehicle Identification (AVI) systems or probe vehicles). The two components complement each other so that the calibration of the DTA system parameters efficiently utilizes both historical as well as real-time information. The calibration approaches are demonstrated with DynaMIT (Dynamic network assignment for the Management of Information to Travelers), using time-varying count, speed and density data obtained from standard loop detectors, as well as synthetic AVI data. Applications from different networks and different solution algorithms are presented. The generality of the calibration framework is further demonstrated through its application for the simultaneous off-line calibration of the demand and supply parameters and inputs of the microscopic traffic simulator model MITSIMLab for a large-scale case study.

Bio: Constantinos Antoniou is Assistant Professor at the National Technical University of Athens (NTUA), Greece, and a Research Affiliate at the Massachusetts Institute of Technology (MIT). He holds a Diploma in Civil Engineering (1995) from NTUA, an M.S. in Transportation (1997) and a PhD in Transportation Systems (2004) from the Massachusetts Institute of Technology (MIT). He has 14 years of experience in modeling, simulation, ITS, road safety and highway engineering projects, primarily in Europe and the US, and has published more than 65 scientific papers in refereed scientific journals and conference proceedings.

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