Calibration of the Demand Simulator in a Dynamic Traffic Assignment System

by

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Abstract

In this thesis, we present a methodology to jointly calibrate the O-D estimation and prediction and driver route choice models within a Dynamic Traffic Assignment (DTA) system using several days of traffic sensor data. The methodology for the calibration of the O-D estimation module is based on an existing framework adapted to suit the sensor data usually collected from traffic networks. The parameters to be calibrated include a database of time-varying historical O-D flows, variance-covariance matrices associated with measurement errors, a set of autoregressive matrices that capture the spatial and temporal inter-dependence of O-D flows, and the route choice model parameters. Issues involved in calibrating route choice models in the absence of disaggregate data are identified, and an iterative framework for jointly estimating the parameters of the O-D estimation and route choice models is proposed. The methodology is applied to a study network extracted from the Orange County region in California. The feasibility and robustness of the approach are indicated by promising results from validation tests.

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