

SIE 561 & C E 561 TRAFFIC MODELING AND SIMULATION Fall 2014

Instructor: Dr. Wei H. Lin
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Class Hours: 9 to 9:50 MWF
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DESCRIPTION

The course will cover various modeling and simulation approaches used in studying traffic dynamics and control in a transportation network. The model-based simulation tools discussed include dynamic macroscopic and microscopic traffic flow simulation and assignment models. Models will be analyzed for their performance in handling traffic dynamics, route choice behavior, and network representation.

TOPICS

- Car following models (microscopic and mesoscopic traffic flow models)
- Solution methods using waves (LWR models, macroscopic traffic flow models)
- Fundamental relationship between flow, speed, and density
- Traffic control for two interacting traffic streams (Miller's model, Gazis's models, work conserving systems)
- Traffic control for serial systems (difference between spatial and point queues)
- User-Equilibrium vs. System Optimum
- Paradoxical phenomenon in system control
- Time-dependent models for bottlenecks
- Time-dependent models for lane-blockage incidents
- The state-of-the-art commercial traffic simulation models

REQUIRED TEXTBOOK

Course notes will be distributed in class.

COURSE EVALUATION

The following weighting system will be used in the course:

- Homework* 40%
- Mid Term Exam 30%
- Final Project 30%

* Homework turned in after the due date will be deducted 10%, and 20% three days after the due date. Homework should be completed independently.