



**The Center for Control, Dynamical Systems, and Computation
University of California at Santa Barbara
Winter 2009 Seminar Series
Presents**

Modeling and Software Tools for Freeway Operational Planning

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Abstract:

The operational strategies improving traffic conditions on congested freeways include reducing excessive demand, targeting resources to alleviate accident hot spots, providing traveler information, and controlling traffic on ramps. Macroscopic traffic models represent traffic as a compressible fluid in terms of flow, density and speed. Our macroscopic model of choice is the discretized Lighthill-Whitham-Richards conservation law, known as Cell Transmission Model (CTM). Aurora Road Network Modeler is a set of tools for operational planning and management of travel corridors (road networks comprised of freeways and surrounding arterials) and analysis of their performance. The talk will focus on the properties and behavior of CTM as nonlinear dynamical system; discuss how these properties can be used in the state estimation and ramp flow control; and show how Aurora RNM can be used for quick quantitative assessment of operational strategies on road networks.

About the Speaker:

Alex Kurzhanskiy received his M.A. in Applied Mathematics from Lomonosov Moscow State University, Russia, in 1998. From 1998 to 2003 he worked as an engineer and consultant for several Silicon Valley companies. He received Ph.D. in Electrical Engineering & Computer Science from UC Berkeley in 2007. Currently he is postdoctoral researcher at the EECS Department of UC Berkeley. His research interests include dynamical systems estimation and control, application of the set-valued calculus to reachability analysis and estimation, robust convex optimization, transportation systems.
