



TRANSPORTATION SEMINAR SERIES

Friday, October 05, 2007

4 - 5 p.m. in 240 Bechtel Engineering Center

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A two-stage stochastic programming model for transportation network protection

Abstract: In this talk, we will discuss some modeling and solution methods for the problem of pre-disaster transportation network protection against uncertain future disasters. Given limited resources, the goal of the central planner is to choose the best set of network components to protect while allowing the network users to follow their own best-perceived routes in any resultant network configuration. This problem is formulated as a two-stage stochastic programming problem with equilibrium constraints, where the objective is to minimize the total expected physical and social loss caused by potential disasters. Developing efficient solution methods for such a problem can be challenging due to the large size and nonconvexity of the problem. We will demonstrate the applicability of progressive hedging-based method for solving large scale stochastic network problems. The methodologies discussed here may be relevant to other types of networks such as information, energy, and social networks as well.

Bio: Yueyue Fan received her doctoral degree in Civil Engineering at the University of Southern California in 2003. She joined the faculty at the University of California, Davis in July 2003, and currently is an assistant professor in the Department of Civil and Environmental Engineering. She is affiliated with the Institute of Transportation Studies at Davis and is a faculty member of the Applied Mathematics Graduate Program. Her research focus is on network optimization, decision making under uncertainty, and transportation and energy infrastructure systems management. Her current research projects include risk management of transportation networks subject to nature hazards and optimal planning of biofuel infrastructure systems and supply chains. She is a leader of the infrastructure system modeling thread in the Sustainable Transportation Energy Pathway (STEPS) Program at UC Davis.

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