UNIVERSITY OF MARYLAND
ROBERT H. SMITH SCHOOL OF BUSINESS

DO&IT Seminar Series

Speaker: J. Cole Smith, Associate Professor
Department of Industrial and Systems Engineering
University of Florida

Date: Friday, October 2, 2009

Time: 2-3:30 pm

Location: VMH 1335

Title: New Product Introduction against a Predator: A Bilevel Mixed-Integer Programming Approach

Abstract: This seminar will consider a scenario in which two firms determine which products to develop and introduce to the market. In this problem, there exists a finite set of potential products and market segments. Each market segment has a priority list of products, and will buy its most preferred product (if one is available). The firms play a Stackelberg game, in which the leader firm acts first to introduce a set of products, and the follower firm responds with its own set of products afterward. The goal of the leader is to maximize its profit subject to a product introduction budget, assuming that the follower will attempt to minimize the leader's profit using a budget of its own. In this talk, we will discuss a formulation of this problem as a multi-stage integer program amenable to decomposition techniques. Using this formulation, we will develop three variations of an exact mathematical programming method for solving the multi-stage problem, along with a family of heuristic procedures for estimating the optimal follower solution. The efficacy of these approaches will be demonstrated on a set of randomly generated test instances. The target audience is for researchers and PhD students in the area of optimization and/or product introduction, and the talk will cover enough basics in large-scale (and multi-level) optimization to make it more broadly accessible.

Bio: Cole Smith is an Associate Professor in the Industrial and Systems Engineering Department at the University of Florida. Dr. Smith's research has applications in logistics and design, manufacturing, military operations, transportation networks, and biomedical systems, and he has collaborated with researchers from Mathematics, Computer Science, Mechanical, Civil, Biomedical Engineering, and Management and Policy. He is a recipient of a Young Investigator Award funded by the Office of Naval Research, and has been funded as a PI on grants from the Defense Advanced Research Projects Agency and the Air Force Office of Scientific Research.