

Grado Department of Industrial and
Systems Engineering
Invited Seminar Series



Dr. Ted Ralphs

**Professor, Industrial and Systems Engineering, Lehigh University
and Visiting Researcher, Zuse Institute, Berlin**

**Monday, February 13, 2017
10:00 – 11:00 a.m., 260 Durham Hall**

Multilevel Optimization and Game Theory: Applications and Algorithms

This talk addresses applications of and solution methods for certain optimization problems arising in game theory. We focus on the case of Stackelberg games in which one player, designated as the "leader," must decide on an optimal course of action under the assumption that the second player, designated as the "follower," will react in accordance with a different, possibly competing, objective. Analysis of such models is necessary in a wide array of applications and requires a deep examination of the duality that arises in the theory of optimization. We discuss applications of this framework and how these problems are solved in practice.

Dr. Ted Ralphs is a Professor in the Industrial and Systems Engineering Department at Lehigh University, and is currently a visiting researcher at the Zuse Institute in Berlin. His primary research interests include theory and methodology for mixed integer programming and bilevel optimization, and computational methods for discrete conic optimization. He is co-founder and director of The Laboratory for Computational Optimization Research Lab at Lehigh (COR@L) which is involved with the development of software for optimization. Moreover, he is the chair of the Technical Leadership Council of the COIN-OR Foundation, a non-profit foundation which has as a primary goal the development of interoperable open source software for operations research. He also maintains major software packages such as CHiPPS (COIN-OR High Performance Parallel Search Framework), SYMPHONY (open-source MILP solver), and GrUMPY (a tool to visualize mathematical programming algorithms in Python). He has also done work in network routing, combinatorial auctions, and interdiction problems. Professor Ralphs has received the prestigious INFORMS Impact Prize and the Meritorious Service Award for Exceptional Contribution to the Journal *Operations Research*.

Refreshments will be available