

Industrial and Systems Engineering Seminar

Conic Integer Optimization

Wednesday, September 30

3:15 PM – Refreshments before the Seminar

3:30 PM – Graduate Seminar

Mechanical Engineering Room 4125 A & B



Professor Alper Atamturk

Professor

Industrial Engineering and Operations Research

University of California - Berkeley

In the last 25 years we have experienced significant advances in conic optimization. Polynomial interior point algorithms that have earlier been developed for linear optimization have been extended to second-order cone optimization and semi-definite optimization. The availability of efficient algorithms for convex conic optimization spurred many novel optimization and control applications in diverse areas ranging from medical imaging to statistical learning, from finance to truss design. However, the advances in convex conic optimization and linear integer optimization have until recently not translated into major improvements in conic integer optimization, i.e., conic optimization problems with integer variables. In this talk we will review the recent progress in conic integer optimization. We will discuss cuts, lifting methods, and conic reformulations for improving computations for general as well as special structured problems and connections to submodular optimization for the 0-1 case. We will present applications of conic integer optimization in probabilistic optimization, portfolio optimization, location/inventory optimization with risk pooling.

BIO: Alper Atamturk is a Professor of Industrial Engineering and Operations Research at the University of California – Berkeley. He received his Ph.D. from the Georgia Institute of Technology in 1998 with a major in Operations Research and minor in Computer Science. His current research interests are in discrete optimization and optimization under uncertainty with applications to energy, finance and operations interface, cancer therapy, and defense. He serves on the editorial boards of Discrete Optimization, Journal of Risk, Mathematical Programming C, Networks, and Operations Research. He served on the organizing committees of INFORMS, IPCO, MIP and few others. He served as vice chair-integer programming of the INFORMS Optimization Society during 2008-2009. Dr. Atamturk is a US Department of Defense National Security Fellow.