Algebraic and Geometric Ideas in the Theory of Linear Optimization

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Kemeny 007, 4:00PM
3:30PM Kemeny 300

Abstract

Abstract: Linear optimization is undeniably a central tool of applied mathematics with applications in a wide range of topics, from statistical regression to image processing. The theory of linear optimization has many beautiful geometric and algebraic topics and it is a source of many fascinating mathematical problems.

In this talk I will present several advances from the past 5 years in the theory of linear optimization. These results include new results on the complexity of the simplex method, the structure of central paths of interior point methods, and about the geometry of some less well-known iterative techniques. One interesting feature of these new theorems is that they connect this very applied algorithmic field with seemingly far away topics like algebraic geometry, differential geometry, and combinatorial topology.

This talk is geared for the non-expert and I wil summarize work by many authors, including results that are my own joint work with subsets of the following people A. Basu, M. Junod, S. Klee, B. Sturmfels, and C. Vinzant.

This talk should be accessible to undergraduates.