BETTER AND FASTER: INTERDISCIPLINARY RESEARCH FOR FUN AND PROFIT

To formulate and solve many real-world problems, we need mathematics and computer science---but our models are never good enough the first time. So we speed up complicated calculations, try to understand and optimize the model, and then make it better. I'll illustrate the process with a problem from Bell Labs, where an interdisciplinary group has worked for several years on a system for designing wireless communication systems. Along with demonstrating a colorful user interface that binds the system together, I'll describe some of the research in computational geometry and optimization that's come from the wireless problem.

Refreshments will be served Monday at 3:00 in Calloway Hall Rm. 310

THE INTERIOR-POINT REVOLUTION IN CONSTRAINED OPTIMIZATION

Interior methods are a central, striking feature of the constrained optimization landscape today. Such methods were popular in the 1960's, primarily in the form of barrier methods, although they were not seriously applied to linear programming because of the dominance of the simplex method. During the 1970's, barrier methods fell from favor for a variety of reasons, including their apparent inefficiency compared with the best alternatives. In 1984, Karmarkar announced a fast polynomial-time interior method for linear programming; a formal connection was soon established between his method and classical barrier methods. Since then, the new incarnations of interior methods have advanced so far, so fast, that their influence has transformed both the theory and practice...
of constrained optimization. This talk surveys selected classical material, recent research, and open questions about interior methods for linear, nonlinear, and semidefinite programming.

**Refreshments will be served Tuesday at 3:30 in Calloway Hall Room 310.**

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