

Matrix Computations and Scientific Computing Seminar

Organizer: J. Demmel and M. Gu

Wednesday, 11:00 am–12:00 pm, 380 Soda Hall

Feb 15 **Martin Lee**, MediaX, Stanford University

Acorn Magic: How linear algebra solves optimization problems non-linearly and why do it?

Recently, the speaker discovered a way to use matrix algebra to solve a set of nonlinear equations by first transforming them into an equivalent matrix equation and then finding the solutions analytically in terms of the elements of the inverse matrix of this equation. With the newly developed ACORN (an adaptive constrained optimal robust nonlinear) algorithm, it is possible to minimize an objective function without computing its derivatives. The convergence of this nonlinear analytic iterative formula requires the proper values of two control parameters (independent of the problem size). The speaker will describe how ACORN works and how it can be used to solve large-scale optimization problems with an innovative approach he calls Acorn Magic (minimization algorithms gathered in a cloud).