Matrix Computations & Scientific Computing Seminar

Wednesday, 12:10–1:00pm, 380 Soda

April 4   **Shiqian Ma**, IMA

Alternating Direction Methods for Sparse and Low-Rank Optimization

In this talk, we propose several alternating direction type methods for solving sparse and low-rank optimization problems. We propose alternating linearization methods (ALM) that can solve unconstrained composite optimization problems. We show that the iteration complexities of the basic and accelerated ALMs are O(1/eps) and O(1/sqrt(eps)), respectively, for obtaining an eps-optimal solution. We also propose an inexact alternating direction method of multipliers that can solve convex optimization problems with three separable blocks. The global convergence result is established. Numerical results on robust PCA, sparse PCA and latent variable graphical lasso with millions of variables are reported to demonstrate the efficacy of our proposed methods.