

# Matrix Computations & Scientific Computing Seminar

Organizer: James Demmel & Ming Gu

Wednesday, 11:00am–12:00pm, 380 Soda

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Nov. 10    **Bin Yu**, UC Berkeley

*Sparse Modeling: a Statistical View*

Extracting useful information from high-dimensional data is the focus of today's statistical research and practice. After broad success of statistical machine learning on prediction through regularization, interpretability is gaining attention and sparsity has been used as its proxy. With the virtues of both regularization and sparsity, Lasso (L1 penalized L2 minimization) and its extensions have been very popular recently.

In this talk, I would like to give an overview on aspects of statistical theory and practice of sparse modeling that includes Lasso and its extensions. First, I will explain what useful insights have been learned from model selection consistency analysis of Lasso and an l1 penalized sparse covariance estimation method when  $p \ll n$ . Second, I will present results on L2-estimation error (when  $p \ll n$ ) and insights learned for a class of M-estimation methods with decomposable penalties. As special cases, our latter results cover Lasso, L1-penalized GLMs, grouped Lasso, and low-rank sparse matrix estimation. (This talk is based on joint works with co-authors Zhao, Meinshausen, Ravikumar, Raskutti, Wainwright, and Neghan.)