

Liu Bie Ju Centre for Mathematical Sciences
City University of Hong Kong

Mathematical Analysis and its Applications Colloquium

Organized by Prof. Hui-Hui Dai and Dr. Dan Dai

Nonsmooth, Nonconvex Regularization for Sparse Optimization

by

Professor Xiaojun CHEN

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Date : **1 December, 2016 (Thursday)**
Time : 4:30 pm to 5:30 pm
Venue : **Room P4302**
Purple Zone, Level 4, Academic 1 (AC1)
City University of Hong Kong

ABSTRACT:

We consider a class of constrained minimization problems where the objective function is a sum of a smooth function and a nonsmooth, nonconvex, perhaps even non-Lipschitz regularization.

On concave regularization including SCAD, MCP and L-p norm ($0 < p < 1$), we show that finding a global optimal solution is strongly NP-hard.

On the other hand, we present lower bounds of nonzero entries in every local optimal solution. Such lower bounds can be used to classify zero and nonzero entries in local optimal solutions and select regularization parameters for desirable sparsity of local optimal solutions. Moreover, we introduce several efficient algorithms including smoothing quadratic regularization algorithms, smoothing trust region Newton methods, interior point algorithms and augmented Lagrangian methods.

Examples of sparse portfolio selection are presented to illustrate the theory and algorithms.

Light refreshments will be provided before the colloquium from 4:00 pm to 4:30 pm. Please come and join us!

**** All interested are welcome ****

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