The Hong Kong Polytechnic University
Department of Applied Mathematics

Colloquium

On

Proximal Methods for Sparsity-reducing Regularization

by

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Abstract

We consider the minimization of the sum of two convex functions in the case where one of them is convex and differentiable, and the other is convex and non-differentiable. The latter plays the role of reducing sparsity. A typical example is the minimization problem

$$\min_x \frac{1}{2}\|\Phi x - u\|_2^2 + \gamma\|x\|_1, \qquad (*)$$

where Φ is an $m \times n$ matrix and $u \in \mathbb{R}^m$ is given. Since the $\ell 1$-norm is viewed as a sparsity-reducing norm, the problem $(*)$ is used to approximate the nonconvex sparse optimization problem

$$\min_x \|x\|_0 \quad \text{subject to} \quad \|\Phi x - u\|_2 \le \varepsilon. \qquad (**)$$

Here $\|x\|_0$ is the $\ell 0$-norm of $\square\square$(i.e., the number of nonzero components of $\square$).

In this talk, I will discuss the proximal methods for minimizing the sum of two convex functions in general, and the minimization problem $(*)$ in particular.

Date	:	**May 4, 2012 (Friday)**
Time	:	**2:00 p.m. – 3:00 p.m.**
Venue	:	**DE408, The Hong Kong Polytechnic University**

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