

数学与系统科学研究院

计算数学所学术报告

报告人: **Dr. Xiaojing Ye**

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报告题目:

**Fast Search-Based Algorithm for  
Nonsmooth Optimization and  
Applications in Image Reconstruction**

邀请人: 陈冲 博士

报告时间: **2014 年 7 月 15 日 (周二)**

**上午 10:00-11:00**

报告地点: **科技综合楼三层 311**

**计算数学所报告厅**

## **Abstract:**

Nonsmooth optimization is a powerful modeling technique for solving a class of sparse recovery and image reconstruction problems. For instance, to enforce proper regularity of recovery according the geometric properties of images, nonsmooth total variation regularization is incorporated in the modeling of image reconstruction. The resulting models, however, yields significant computational difficulties especially when the problem involves large data in real applications. To tackle the computational issue, we use variable splitting to separate the nonsmooth term, and employ the Barzilai-Borwein method to reduce per-iteration complexity and achieve high overall efficiency. We further develop an efficient backtracking strategy to search for the optimal step size in each iteration, and prove that the numerical scheme with such backtracking converges to an exact solution of the optimization problem. Numerical results on some real data demonstrate the outstanding efficiency of the method.

## **Biography:**

Dr. Xiaojing Ye is currently an assistant professor of mathematics at Georgia State University, USA. He received bachelor degree of mathematics from Peking University in China, and master degree of statistics and doctoral degree of mathematics both from University of Florida in USA. His research interests are PDE-based image analysis, numerical optimization, stochastic modeling and computations.

欢迎大家参加!