数学与系统科学研究院

计算数学所学术报告

报告人：　　**A.P. Yin Wotao**

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报告题目：

A Feasible Method for Optimization with Orthogonality Constraints

邀请人：　　戴彧虹研究员

报告时间：**2010** 年 **12** 月 **21** 日（周二）

下午 **15：30**

报告地点：　　科技综合楼三层 **311**

计算数学所报告厅

Abstract:

Minimization with orthogonality constraints (e.g., X'X=I) and/or spherical constraints (e.g., ||x||_2=1) has wide applications in polynomial optimization, combinatorial optimization, eigenvalue problems, matrix rank minimization, etc. These problems are difficult because the constraints are not only non-convex but numerically expensive to preserve during iterations. To deal with these difficulties, we propose to use a Crank-Nicholson-like update scheme to preserve the constraints and, based on it, develop a curvilinear search algorithm. Preliminary numerical experiments on a wide collection of problems show that the proposed algorithm is very promising. In particular, for the maxcut problem, it exactly solves a decomposition formulation for the SDP relaxation. For polynomial optimization, nearest correlation matrix estimation and extreme eigenvalue problems, the proposed algorithm runs very fast and returns solutions no worse than those from the specialized solvers. On the largest problem "tai256c" in QAPLIB, it takes merely 5 minutes on a laptop to reach a gap of 0.842% to the best known solution.

This is joint work with Zaiwen Wen (Shanghai Jiaotong University)

Biography:

Professor Wotao Yin received B.S. in mathematics from Nanjing University in 2001, and M.S. and Ph.D. in operations research from Columbia Univesity in 2003 and 2006, respectively. Since 2006, he has been with the faculty of Rice University, the Department of Computational and Applied Mathematics, in Houston, Texas, the United States. He received NSF CAREER Award in 2008 and Sloan Research Fellowship in 2009.

Professor Yin's research interests include convex and combinatorial optimization, inverse problems, and variational image processing. He is also interested in the applications of optimization in signal processing, imaging, computer vision, and computer graphics.

欢迎大家参加！