数学与系统科学研究院

计算数学所学术报告

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报告题目：

Iterative Reweighted Minimization Methods for l_p Regularized Unconstrained Nonlinear Programming

邀请人：中科院数学院优化与应用研究中心

报告时间：**2013** 年 **12** 月 **11** 日（周三）

下午 **14:30-15:15**

报告地点：　科技综合楼三层 **311**

计算数学所报告厅

Abstract:

In this talk we consider general l_p regularized unconstrained minimization problems. In particular, we derive lower bounds for nonzero entries of the first- and second-order stationary points and hence also of local minimizers of the l_p minimization problems. We extend some existing iterative reweighted l_1 (IRL1) and l_2 (IRL2) minimization methods to solve these problems and propose new variants for them in which each subproblem has a closed-form solution. Also, we provide a unified convergence analysis for these methods. In addition, we propose a novel Lipschitz continuous $\eps$-approximation to $\|x\|^p_p$. Using this result, we develop new IRL1 methods for the l_p minimization problems and show that any accumulation point of the sequence generated by these methods is a first-order stationary point, provided that the approximation parameter ϵ is below a computable threshold value. This is a remarkable result since all existing iterative reweighted minimization methods require that ϵ be dynamically updated and approach zero. Our computational results demonstrate that the new IRL1 method and the new variants generally outperform the existing IRL1 methods.

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