

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:

**Algorithm Development: Seeking
Sparsity in Primary Space via
Density in Dual Space**

邀请人: 戴彧虹 研究员

报告时间: 2015 年 12 月 18 日 (周五)

上午 9:00~9:55

报告地点: 科技综合楼三层

311 报告厅

Abstract:

We show that seeking the sparsest solution to a linear system can be transformed to searching for the densest slack variable of the dual problem of weighted l_1 -minimization with all possible choices of nonnegative weights. Based on this fact, a new development of reweighted l_1 -algorithms can be made for the sparsest solutions of linear systems, going beyond the framework of existing sparsity-seeking frameworks. Unlike existing reweighted l_1 -methods that are based on the weights defined directly in terms of iterates, the new algorithm computes a weight in dual space via certain convex optimization and uses such a weight to locate the sparsest solutions. It turns out that the new algorithm converges to the sparsest solutions of linear systems under some mild conditions that do not require the uniqueness of the sparsest solutions. Empirical results demonstrate that this new computational method remarkably outperforms l_1 -minimization and stands as one of the efficient sparsity-seeking algorithms for the sparsest solutions of systems of linear equations.

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