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：

Guaranteed Matrix Completion via Non-convex Factorization

邀请人：　刘亚锋 博士

报告时间：**2015** 年 **7** 月 **8** 日（周三）

下午 **16:00~17:00**

报告地点：　科技综合楼三层

301 小报告厅

Abstract:

In many modern applications such as recommendation systems and sensor localization, it is impossible or too costly to obtain all data, resulting in a data matrix with most entries missing. A problem of great interest is then to infer the missing data based on very few observations, usually under the assumption that the true data matrix is low rank, which is widely known as the matrix completion problem. A popular approach for large-scale matrix completion is the matrix factorization (MF) formulation. However, due to the non-convexity caused by the factorization model, little is known about when the algorithms for the MF formulation will generate a good solution. In this talk, we present a theoretical guarantee for the factorization based formulation to correctly recover the underlying low-rank matrix. In particular, we show that under similar conditions to those in previous works, many standard optimization algorithms converge to the global optima of a non-convex factorization based formulation, and recover the true low-rank matrix. We prove a geometric property of the problem that is algorithm-independent, thus our result can cover many standard algorithms such as gradient descent, SGD and block coordinate gradient descent.

Bio-sketch:

Ruoyu Sun is currently a postdoctoral scholar in the Department of Management Science and Engineering at Stanford University, working with Prof. Yinyu Ye. He completed his Ph.D. in Electrical Engineering at the University of Minnesota in 2015 under the supervision of Prof. Zhi-Quan Luo. He received the B.Sc. degree in mathematics from Peking University, Beijing, China in 2009. His research interests lie broadly in optimization, machine learning, signal processing, information theory, wireless communications and their intersections. Recently, he has been working on big data optimization and matrix completion.

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