

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:

**Completing Low-Rank Matrices with  
Nonnegative Factors**

邀请人: 袁亚湘研究员

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**计算数学所教室**

## **Abstract:**

We identify the need for recovering nonnegative matrices  $X$  and  $Y$ , as well as their low-rank product  $M=XY$ , from very few entries of  $M$ .

This problem is closely related to the two existing problems:

nonnegative matrix factorization and low-rank matrix completion, in the sense that it kills two birds with one stone. By taking advantages of both nonnegativity and low rank, the recovery is superior than those of the two problems alone. Our algorithm is applied to minimizing a non-convex constrained least-squares formulation and is based on the classic alternating direction augmented Lagrangian method. Preliminary convergence properties and numerical simulation results are presented. Compared to a recent algorithm for nonnegative random matrix factorization, the proposed algorithm yields comparable factorization through accessing only half of the matrix entries. On tasks of recovering incomplete grayscale and hyperspectral images, the results of the proposed algorithm have overall better qualities than those of two recent algorithms for matrix completion.

Joint work with Yangyang Xu, Zaiwen Wen (Shanghai Jiaotong U), and Yin Zhang

欢迎大家参加!