



复旦大学数学科学学院 数学综合报告会

报告题目: **Rapid, Robust, and Reliable Algorithms for Bilinear Inverse Problems with Applications in Imaging Science and Signal Processing**

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摘要: Bilinear inverse problem pervades many areas of science and technology, including astronomy, medical imaging, optics, and wireless communications. However, efficient and reliable algorithms for their solution are still lacking since the intricate non-convex optimization problem might exhibit many local minima. I will discuss several recent breakthrough results in the development of powerful algorithms for a range of bilinear problems. One example concerns the notoriously ill-posed blind deconvolution problem. More precisely, assume we are given a function y which is the convolution of two unknown functions f and g . When and how is it possible to recover f and g from the knowledge of y ? I will present the first numerically efficient nonconvex blind deconvolution algorithm that comes with rigorous convergence guarantees. We will also consider more general bilinear problems, such as self-calibration problems, closely related to biconvex compressive sensing. The idea behind self-calibration is to equip a hardware device with a smart algorithm that can compensate automatically for the lack of calibration. Applications in array processing, imaging and wireless communications will be presented.

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