学术报告

Nonconvex Approaches in Data Science

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Abstract： Although "big data" is ubiquitous in data science, one often faces challenges of "small data," as the amount of data that can be taken or transmitted is limited by technical or economic constraints. To retrieve useful information from the insufficient amount of data, additional assumptions on the signal of interest are required, e.g. sparsity (having only a few non-zero elements). Conventional methods favor incoherent systems, in which any two measurements are as little correlated as possible. In reality, however, many problems are coherent. I will present two nonconvex approaches: one is the difference of the L_1 and L_2 norms and the other is the ratio of the two. The difference model works particularly well in the coherent regime, while the ratio is a scale-invariant metric that works better when underlying signals have large fluctuations in non-zero values. Various numerical experiments have demonstrated advantages of the proposed methods over the state-of-the-art. Applications, ranging from super-resolution to low-rank approximation, will be discussed.

欢迎大家参加！