STATISTICAL OPTIMALITY AND COMPUTATIONAL TRACTABILITY OF ICA

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Abstract

Independent component analysis (ICA) is a powerful and general data analysis tool. Yet there is an increasing amount of empirical evidence that the classical methods for ICA are not well suited for modern applications, both computationally and statistically, where the effect of dimensionality is not negligible. We will investigate the optimal sample complexity and statistical performance for ICA, and how considerations of computational tractability may affect them. We will also introduce estimating procedures for ICA that are both statistically efficient and computationally tractable. Our development exploits the close connection between ICA and moment estimation and reveals a number of new insights for both problems.

Biography

Ming Yuan is a Professor of Statistics at Columbia University. Yuan's expertise lies in high-dimensional statistics and model selection and also spans various other quantitative and computational fields, including optimization, machine learning, computational biology, and financial engineering. He served as co-Editor of the Annals of Statistics and has been a member of numerous other editorial boards. He delivered an IMS Medallion Lecture in 2018, and among other honors, he received the Leo Breiman Junior Award in 2017 and the 2014 Guy Medal in Bronze from the Royal Statistical Society.

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