Algorithms for independent component analysis

Navin Goyal
Microsoft Research, Bangalore

10/13/2015 at 11:00 am
Core A (Room 301)

Abstract

Independent component analysis is a basic problem that arises in several areas including signal processing, statistics, and machine learning. In this problem, we are given linear superpositions of signals. E.g., we could be receiving signals from several sensors but the receivers only get the weighted sums of these signals. The problem is to recover the original signals from the superposed data. In some situations this turns out to be possible: the main assumption being that the signals at different sensors are independent random variables.

While independent component analysis is a well-studied problem, one version of it was not well-understood, namely when the original signals are allowed to be heavy-tailed, such as those with a Pareto distribution. Such signals do arise in some applications. In this talk, I will discuss new algorithms for this problem. Our techniques draw ideas from convex geometry and exploit standard properties of the multivariate spherical Gaussian distribution in a novel way.

Bio

Navin Goyal received his PhD from the Rutgers CS department in 2005, and held research positions at McGill University and Georgia Tech, before moving to Microsoft Research in 2009. He has published dozens of articles in well-regarded journals and conferences.

Faculty Host: Eric Allender