

Title: Recent progress on random graph matching problems

Abstract:

A basic goal for random graph matching is to recover the vertex correspondence between two correlated graphs from an observation of these two unlabeled graphs. Random graph matching is an important and active topic in combinatorial statistics: on the one hand, it arises from various applied fields such as social network analysis, computer vision, computational biology and natural language processing; on the other hand, there is also a deep and rich theory that is of interest to researchers in statistics, probability, combinatorics, optimization, algorithms and complexity theory. Recently, extensive efforts have been devoted to the study for matching two correlated Erdős–Rényi graphs, which is arguably the most classic model for graph matching. In this talk, we will review some recent progress on this front, with emphasis on the intriguing phenomenon on (the presumed) information-computation gap. In particular, we will discuss progress on efficient algorithms thanks to the collective efforts from the community. We will also point out some important future directions, including developing robust algorithms that rely on minimal assumptions on graph models and developing efficient algorithms for more realistic random graph models.

This is based on joint works with Guanyi Chen, Yumou Fei, Hang Du, Shuyang Gong, Zhangsong Li and Yuanzheng Wang.