

Sharp thresholds for sparsity recovery in high-dimensional and noisy setting using l_1 relaxations

Martin Wainwright

University of California, Berkeley

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Abstract

Consider a rectangular matrix of iid elements. The talk shall be concerned with the asymptotic behavior (as m, n increase) of certain class of the row-column symmetric functionals of iid matrices which were called by Cauchy in his famous memoir on determinants "permanently symmetric". It turns out that the class of such functions includes some well known sub-classes of symmetric functions like e.g., U -statistics.

Due to the duality between random matrices and bipartite random graphs, the problem may be also described in terms of the functionals on the matchings of the corresponding random graphs. Such an interpretation is of interest since many of the counting problems involving matchings are known to be #P hard.

The talk shall present some results on the asymptotic behavior and offer various examples of applications starting from the classical Dynkin-Mandelbaum result on the limits of U -statistic until a more recent theorems on distribution of monochromatic matchings in bipartite graphs.