The Maximum Likelihood Threshold of a Graph

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The maximum likelihood threshold of a graph is the smallest number of data points that guarantees that maximum likelihood estimates exist almost surely in the Gaussian graphical model associated to the graph. We show that this graph parameter is connected to the theory of combinatorial rigidity. In particular, if the edge set of a graph G is an independent set in the $n-1$-dimensional generic rigidity matroid, then the maximum likelihood threshold of G is less than or equal to n. This connection allows us to prove many results about the maximum likelihood threshold.

Joint work with Elizabeth Gross (San Jose State University).