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Edge and Pair Queries—Random Graphs and Complexity

Consider a query game played on a graph whose goal is to locate a vertex v^* that is unknown to an adaptive query algorithm. Each query points to a pair of vertices u and v, and the reply provides an answer that indicates which of those vertices is closer to v^*, breaking ties arbitrarily. The aim is to construct an algorithm performing as few queries as possible in the worst case. In this work we consider two types of queries: edge queries in which u and v need to be adjacent and pair queries in which there is no restriction on the choice of u and v. The latter have not been considered in the literature before while the former have been extensively studied but only for trees. In this talk, we concentrate on investigating the two associated graph parameters for binomial random graphs, and showing that determining any of the two parameters is NP-hard for bounded degree graphs.