Finding structures in random graphs economically

Pedro Vieira

Abstract

We discuss a new setting of algorithmic problems in random graphs, studying the minimum number of queries one needs to ask about the adjacency between pairs of vertices of $G(n,p)$ in order to typically find a subgraph possessing a certain structure. More specifically, given a monotone property of graphs $\mathcal{P}$, we consider $G(n,p)$ where p is above the threshold probability for $\mathcal{P}$ and look for adapative algorithms which query significantly less than $\binom{n}{2}$ pairs of vertices in order to reveal that the property $\mathcal{P}$ holds with high probability. In this talk we focus particularly on the properties of containing a Hamilton cycle and containing paths of linear size. The talk is based on joint work with Asaf Ferber, Michael Krivelevich and Benny Sudakov.