On the local resilience of random regular graphs

Sonny Ben-Shimon (joint with with M. Krivelevich and B. Sudakov)

Abstract

For a graph property , the *global resilience* of a graph G with respect to is the minimal number of additions and removals of edges from G such that the resulting graph does not possess . For some graph properties this quantity does not seem to convey what one would expect from such a notion of "distance". Consider now the *local resilience* of a graph G with respect to , where there is an additional constraint of a bounded number of editions done on edges incident to a single vertex. This notion, which was implicitly studied for some ad-hoc properties, was recently treated in a more systematic way in a recent paper by Sudakov and Vu. Most research conducted with respect to this distance notion was focused on the random graph model and some families of pseudo-random graphs with respect to several graph properties such as containing a perfect matching, containing long cycles (i.e. linear in the number of vertices), and being Hamiltonian to name a few. In this talk we continue to explore the local resilience notion, but turn our attention to random and pseudo-random *regular* graphs of constant degree. In particular we focus on the local resilience with respect to edge and vertex connectivity, containing a perfect matching, and being Hamiltonian.