Combinatorics Seminar

Cleaning d-regular graphs with brushes

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Abstract: A model for cleaning a graph with brushes was recently introduced. We consider the minimum number of brushes needed to clean d-regular graphs in this model, focusing on the asymptotic number for random d-regular graphs. We use a degree-greedy algorithm to clean a random d-regular graph on n vertices (with dn even) and analyze it using the differential equations method to find the (asymptotic) number of brushes needed to clean a random d-regular graph using this algorithm (for fixed d). We further show that for any d-regular graph on n vertices at most n(d+1)/4 brushes suffice, and prove that for fixed large d, the minimum number of brushes needed to clean a random d-regular graph on n vertices is asymptotically almost surely n(d+o(d))/4.

(Joint work with Noga Alon and Nick Wormald.)

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Mathematics and Computer Science
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