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Optimal Polynomials for the k-independence Number of Graphs

A k-independent set in a graph is a set of vertices such that any two vertices in the set are at distance at least $k + 1$ in the graph. The k-independence number of a graph, denoted α_k, is the size of a largest k-independent set in the graph. Abiad et al gave a generalization of the Hoffman ratio bound on α_k, which involves taking polynomials of degree at most k. A good bound therefore depends on making the right choice of a polynomial. In this talk, we highlight the known optimal polynomials for $k = 1, 2, 3$ and their corresponding bounds on α_k, and give a possible generalization of these polynomials.