Michael Tait* (mtait@cmu.edu). Using random polynomials in extremal graph theory.

For a fixed integer $k$ we consider the problem of how many edges may be in an $n$-vertex graph where no pair of vertices have $t$ internally disjoint paths of length $k$ between them. When $t = 2$ this is the notorious even cycle problem. We show that such a graph has at most $c_k t^{1-1/k} n^{1+1/k}$ edges, and we use graphs constructed via random polynomials to show that the dependence on $t$ is correct when $k$ is odd.

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