

Geometry Seminar
Tuesday, Feb 01, 2011
Room 201 WWH at 6:00 P.M.

Improved Bounds on the $(1, k)$ -Separation Problem

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In 1979, Tverberg proved that for every positive integer k there exists an integer f_k such that given any family of f_k pairwise disjoint convex sets in the plane, there exists a line which separates one of them from k of the others ($f_1 = 2$ is a basic result about convex sets).

He proved that $f_2 = 5$ but otherwise provided a very large upper bound on the size of f_k . Ten years later Hope and Katchalski showed that $3k - 1 \leq f_k \leq 12(k - 1)$. We prove the upper bound $f_k < (4 + \sqrt{10})(k - 1)$ (the coefficient is approximately 7.16), thus more than halving the range in which f_k may lie. The proof uses allowable interval sequences, introduced by Goodman and Pollack in 2005.

For more information please visit the seminar website at:
http://www.math.nyu.edu/seminars/geometry_seminar.html.