Seminar on Combinatorial Computing
February 22, Wednesday, 6:30 p.m.
Room 1314, Courant Institute
251 Mercer Street, New York

The k-set problem

Shakhar Smorodinsky
Courant Institute

Abstract

Let P be a set of n points in the Euclidean d-dimensional space. A subset P' of P is called a k-set if its cardinality is k and there exists a half-space H such that $P' = H \cap P$ (that is, P' can be separated from its complement by a hyperplane). The problem of determining the asymptotic of $f_d(n, k)$, the maximum number of distinct k sets that an n-element point set in R^d can have (for a fixed d) was posed more than 30 years ago by Erdős et al. and Lovász. Solution to this problem remains elusive even in the plane (i.e., $d = 2$). We survey the recent results that achieve the best known upper bounds in dimensions two 2, 3, and 4. In addition to the purely combinatorial interest, this problem has many applications in computational geometry.

For further information contact Janos Pach at pach@cims.nyu.edu, or visit our website
http://www.math.nyu.edu/p̃ach/public_html/combinatorics_seminar.html