Seminar on Combinatorial Computing
December 19, Wednesday, 6:30 p.m.
Room 6417, Graduate Center
365 Fifth Avenue, New York

On distinct distances
among points in general position

Adrian Dumitrescu
University of Wisconsin, Milwaukee

Abstract

A set of points in the plane is said to be in *general position* if no three of them are collinear and no four of them are cocircular. If a point set determines only distinct vectors, it is called *parallelogram free*. We show that there exits n-element point sets in the plane in general position, and parallelogram free, that determine only $O(n^2/\sqrt{\log n})$ distinct distances. This answers a question of Erdős, Hickerson and Pach.

We then turn to an old problem of Erdős : given any n points in the plane (or in d dimensions), how many of them can one select so that the distances which are determined are all distinct? — and provide (make explicit) some new bounds in one and two dimensions. Other related distance problems are also discussed.

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