Seminar on Combinatorial Computing
May 7, Wednesday, 6:30 p.m.
Room 6417, Graduate Center
365 Fifth Avenue, New York

Monotone paths in line arrangements with a small number of directions

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Abstract

In this talk, we give subquadratic bounds on the maximum length of an x-monotone path in an arrangement of n lines with at most $C \log\log n$ directions, where C is a suitable constant. For instance, the maximum length of an x-monotone path in an arrangement of n lines having at most 10 slopes is $O(n^{67/34})$. In particular, we get tight estimates for the case of lines having at most five directions, by showing that previous constructions – $\Omega(n^{3/2})$ for arrangements with four slopes and $\Omega(n^{5/3})$ for arrangements with five slopes – due to Sharir and Matoušek respectively, are (asymptotically) best possible.

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