Geometry Seminar
February 21, 2006, Tuesday, 2:30 p.m.
Room 1314, Courant Institute
251 Mercer Street, New York

Random triangulations of a planar point set

Micha Sharir
Tela Aviv University and Courant Institute

Abstract

Let S be a finite set of $n+3$ points in general position in the plane, with 3 extreme points and n interior points. We consider triangulations drawn uniformly at random from all triangulations of S, and investigate the expected number, $\hat{v}_i$, of interior points of degree i in such a triangulation. We provide bounds that are linear in n on these numbers. In particular, $n/43 \leq \hat{v}_3 \leq (2n+3)/5$, and for all $i \geq 3$ there is a constant δ_i so that $\hat{v}_i \geq \delta_i n$, provided n is large enough.

Moreover, we relate these results to the question about the maximum and minimum possible number of triangulations in such a set S, and show that the number of triangulations of any set of n points in the plane is at most 43^n, thereby improving on a previous bound by Santos and Seidel. (It seems that the 43 can be improved, with additional effort, to less than 32.) Joint work with Emo Welzl

For further information contact {pach,pollack}@cims.nyu.edu, or visit our website: http://www.math.nyu.edu/seminars/geometry_seminar.html