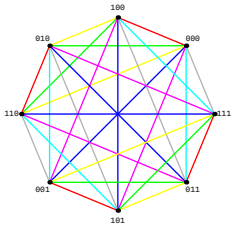
Discrete Mathematics and Optimization Seminar

F2002



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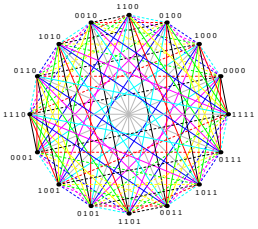

October 9 (Wednesday), 17:00 – 18:00, McConnel 103

An Erdős-Szekeres type problem in the plane

by

Prof. Gyula Károlyi
Eötvös University, Budapest

Abstract. The Erdős–Szekeres convex polygon theorem asserts that among sufficiently many points, in general position in the plane, one can always find the vertices of a convex n-gon. In this talk we survey some results and intriguing open problems related to this theorem, and study in detail the following problem:

Let $f(k,n)$, $n \geq k \geq 3$, denote the smallest positive integer such that any set of $f(k,n)$ points, in general position in the plane, contains n points whose convex hull has at least k vertices.

The study of this function was motivated by a problem of Joe Mitchell concerning partition of point sets into (the vertex sets of) convex quadrilaterals, a question related to quadrangular mesh generation. We give lower and upper estimates on $f(k,n)$, both in the form $c_1kn + 2^{c_2k}$, obtained together with Géza Tóth.

Organizers: D. Avis(CS), W. Brown(Math), D. Bryant(CS/Math), L. Devroye(CS), K. Fukuda(CS), B. Reed(CS), V. Rosta(Math), G. Toussaint(CS) and S. Whitesides(CS).
Information: http://www.cs.mcgill.ca/~fukuda/semi/discmath.html