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Polygon Space

Abstract for the Combinatorics and Number Theory Seminar 2003 April 7

A *polygon* is a Hamiltonian circuit of the complete graph on n vertices. If we assign real-number ``lengths to the edges, each polygon has a length (that is, a real number), which induces a linear quasiordering of the set of all polygons. We call such a quasiordering *realizable*. Now suppose the ``lengths really are lengths. That is, we pick n points in Euclidean space E^d, $(P_i) = (P_1, P_2, \ldots, P_n)$, and define the length of edge ij to be the distance $d(P_i, P_j)$. There are some obvious questions. Which realizable quasiorderings are realizable by points in E^d? One could allow some of the points to coincide, or not; these give different answers. Given points (P_i) , inducing a certain realizable quasiordering, which other realizable quasiorderings are realizable by points (Q_i) arbitrarily near (P_i)? I will discuss these questions.

This will be a very informal talk with at most bits of hints of proof.