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Perpendicular Dissections of Euclidean Space, With Gain Graphs

Abstract for the Combinatorics and Number Theory Seminar 2000 November 1

Given *n* reference points in real *d*-space, we specify a finite set of hyperplanes that are perpendicular to lines that join pairs of the *n* points. These hyperplanes dissect the space into a number of regions which is determined by the intersection semilattice of the hyperplanes. The semilattice in turn is, for generic reference points, determined by *d* and the lift matroid of a gain graph that corresponds to the specifications of the hyperplanes.

Examples include the ``braid arrangements'' and their affine deformations, that have lately attracted interest in some quarters.

Dissections of this kind arise from generalizing a problem in geometric voting theory. I will discuss some particular examples of possible interest for voting.

The talk will to a great extent depend on pictures and will not assume any knowledge of weird technical machinery.

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