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Title of Poster Presentation: N-Dimensional Medians and Convex Functions

Abstract:
The classical definition of a median in R^1 is defined in the following way: Given a set S, where S={x1,x2,∑,xk} and x1<x2<∑<xk, the median is the middle term. The idea of a middle term does not work well in more than one dimension, for the median will not be preserved through coordinate changes. The median can be described as the point z that minimizes the following function, f(z) = |z-x1| + |z-x2| +∑+|z-xk|. Using this definition, the median will be preserved through any kind of coordinate changes, translational, and rotational motion. This definition applies to all spaces R^n.

The goal of the project is to construct an algorithm that will find the median given a random number of points in R^n, where n is randomly generated also. Because the minimizing function is comprised of convex functions, we can exploit this in order to prove that the function f gives a unique median.