

Distribution of simplexes in thin subsets of Euclidean space and Riemannian manifolds

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The basic question we ask is, how large does the Hausdorff dimension of a subset of Euclidean space need to be to ensure that it contains the vertices of a given simplex, or, more modestly, of a positive proportion of all possible simplexes. Geometric combinatorial consequences pertaining to the Erdos single distance conjecture will also be discussed as well as variants of these problems on Riemannian manifolds.