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Hypergraph list coloring and Euclidean Ramsey Theory

It is well known that one can color the plane by 7 colors with no monochromatic configuration consisting of the two endpoints of a unit segment, and it is not known if a smaller number of colors suffices. Many similar problems are the subject of Euclidean Ramsey Theory.

We show that for any finite set of points K in the plane, and for any finite integer s , one can assign a list of s distinct colors to each point of the plane, so that any coloring of the plane that colors each point by a color from its list contains a monochromatic isometric copy of K . The proof follows from a general new theorem about coloring uniform simple hypergraphs with large minimum degrees from prescribed lists.

(Joint work with A. Kostochka.)