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R. Amzi Jeffs*, amzij@cmu.edu. *Using Sunflowers of Convex Open Sets to Prove New Embedding Dimension Bounds for Neural Codes.*

We study the following question: given a combinatorial code, what is the smallest dimension in which one can realize it as the code of a collection of convex open sets? This question generalizes the classical discrete geometric question of determining d -representability of a simplicial complex. Results of Wegner and Perel'man imply that every simplicial complex on n vertices is $(n-1)$ -representable. In contrast to this result, we will show that the smallest dimension in which one can realize a code on n elements may grow exponentially as a function of n . Our work relies on a recent Helly-type theorem regarding “sunflowers” of convex open sets. (Received September 16, 2021)