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Alexander Ruys de Perez* (amrp3@gatech.edu). *Rigid Structures in Closed Nonconvex Codes.*

Neural codes arise from the biological discovery of the place cell, a neuron in the mammalian brain that will fire if and only if the neuron's owner is currently in a region of physical space corresponding to that neuron. A neural code on n neurons is a combinatorial object that encodes the intersections of a collection of n subsets $\{U_i\}_{i=1}^n$ of some Euclidean space, with the implication that the subsets are regions corresponding to various place cells. Central to the study of neural codes is the problem of convexity: can one determine whether a neural code encodes a collection $\{U_i\}$ where each U_i is convex? Work by Jeffs (2019) found a phenomenon called a sunflower, which prevents convexity in the case where every U_i is open. Here, we present an analogue to the sunflower for the case where each U_i is closed set. We will explain how this analogue, called a rigid structure, can prevent a code from being closed convex, and describe a family of codes that are not closed convex due to the presence of rigid structures. (Received September 20, 2021)