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Algebraic Signatures of Convex and Non-Convex Neural Codes

The brain represents stimuli via patterns of neural activity. These activity patterns can be described by a neural code, e.g. a collection of indicator vectors showing which neurons co-fire in response to various stimuli. It is believed that the brain can infer many properties of the stimulus space purely from the intrinsic structure of the neural code. In this talk, we present algebraic techniques that enable us to determine if a given neural code is convex, and thus has additional structure that can be used to understand stimulus space structure.