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*Neural ideals and stimulus space visualization*

A neural code  $\mathcal{C}$  is a collection of binary vectors that record the co-firing patterns of a set of neurons. We look at codes arising from place cells, neurons that respond to geographic stimulus. The stimulus space is visualized as a subset of  $\mathbb{R}^2$  covered by convex sets  $\mathcal{U}$  which form an Euler diagram for  $\mathcal{C}$ . There are some methods to determine if a realization  $\mathcal{U}$  exists; however, these do not construct a realization. We consider the problem of algorithmically drawing diagrams using two polynomial ideals: the neural ideal, a pseudo-monomial ideal; and the neural toric ideal, a binomial ideal.