MS1-3: Canonical forms and Gröbner bases of neural ideals

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The neural ideal was introduced by Curto et al. as an algebraic object that can be used to better understand the combinatorial structure of neural codes. A neural ideal has a special generating set, called its canonical form, that encodes a minimal description of the so-called receptive field structure intrinsic to the neural code. Also, for a given monomial order, a neural ideal is generated by its (marked reduced) Gröbner basis with respect to that monomial order. It was shown recently by Garcia et al., that for small dimensions, Gröbner basis computations are faster than canonical form ones. In this talk we will discuss the relationship between the canonical form and the Gröbner basis of a neural ideal. In particular, we'll present a result on when a canonical form is a Gröbner basis.