

University of Maryland

Neuroscience and Cognitive Science Seminar

A computational logic for olfaction

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Sensory stimuli evoke spiking activities patterned across neurons and time that encode information about its identity. Since the same stimulus can be encountered in a multitude of ways, how stable or flexible are these stimulus-evoked responses? I will examine this issue in the locust olfactory system. I will reveal how spatial and temporal features of odor-evoked responses can vary significantly with stimulus-history. Next, I will show how these variations allow the antennal lobe circuit to enhance the contrast of the stimulus with respect to the cues previously encountered, but as a result confound the information about odorant identity. I will go on to reveal drawbacks of using conventional decoding schemes based on combinatorial and temporal properties of odor-evoked responses. Instead a linear decoding scheme involving flexible subsets of neurons to robustly recognize the odorant identity will be presented. I will conclude my talk with a brief discussion of how the tradeoff between stability vs. flexibility can be achieved in sensory coding.

Friday, October 6, 2017

10:15am, Room 1103 Bioscience Research Building

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