
*Thursday, November 22nd, 2012
13h30, Room SG 0213*

Computational Neuroscience Seminar

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Does the variability of sensory neurons constrain the accuracy of perception?

In perceptual decision making tasks, animals have to make choices about the nature of a sensory stimulus close to their psychophysical threshold. A body of work during the last two decades has shown that responses of sensory neurons during these tasks is variable across different presentations of the same stimulus, and that this variability is weakly, but significantly correlated with perceptual judgements about the stimulus. These correlations (referred to as choice probability -- CP) have been interpreted as representing a causal influence of sensory neurons on choice, which implies that variability in the activity of sensory neurons sets an upper bound on the accuracy of perception. I will review recent evidence which calls into question this interpretation, describe a simple model of perceptual decision making which suggests two alternative origins for measured CPs, and present results of a re-analysis of the data from classic perceptual decision making experiments in primates which supports this new interpretation. Overall, our work suggests that the accuracy of perception is less constrained by noisy sensory processing than previously thought.