THE CRM APPLIED MATHEMATICAL AND PHYSICS (CAMP) SEMINARS

CENTRE DE RECERCA MATEMÀTICA

Panagiota Theodoni

Centre de Recerca Matemàtica

Fluctuations in Perceptual Decisions

Abstract:

Fluctuations in perceptual decisions emerge when our brain confronts with ambiguous sensory stimuli. For instance, our perception alternates between two conflicting images when presented dichoptically to our eyes, allowing a dissociation of the sensory stimulation from the conscious visual perception, and therefore providing a gateway to consciousness.

How does the brain work when it deals with such ambiguous sensory stimuli? We addressed this question theoretically by employing a biophysically realistic attractor network, by consistently reducing it to a four-variable rate-based model, and by extracting analytical expressions for second- order statistics. We considered human behavioral and macaque neurophysiological data collected when subjects were confronting with such ambiguities.

Our results show the relevance of neuronal adaptation in perceptual decision making, as well as that it contributes to the speed- accuracy trade- off. Furthermore, our findings affirm that both noise and neural adaptation operate in balance during the fluctuating states of visual awareness and suggest that while adaptation in inhibition is not relevant for the perceptual alternations, it contributes to the brain dynamics at rest. Finally, we explain the observed neuronal noise- decorrelation during visual consciousness and provide insights on the long-standing question: where in the brain rivalry is resolved.

Date:	**May 22, 2014**
Place:	**Room C1/028**
Time:	**12:00**