
*Thursday, November 13th, 2014
13h30, Room AAC 132*

Computational Neuroscience Seminar

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Information-limiting correlations

Computational strategies used by the brain depend strongly on the amount of information that can be stored in population activity, which in turn depends strongly on the pattern of noise correlations. In vivo, noise correlations tend to be positive and proportional to the similarity in tuning properties. Such correlations are thought to limit information, which has led to the suggestion that decorrelation increases information. In this talk, I will show analytically and numerically that, in contrast, decorrelation does not imply an increase in information. Instead, the only information-limiting correlations are what we call differential correlations: correlations proportional to the product of the derivatives of the tuning curves. Differential correlations are likely to be very small, and buried under correlations that do not limit information, making them particularly difficult to detect. We show, however, that the impact of differential correlations on information can be detected with relatively simple decoders.