



Forum

Energy landscape analysis of brain dynamics

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1F Seminar Room, CBS East Bldg.

Abstract

I will introduce the so-called energy landscape analysis. In this analysis, one regards brain dynamics (i.e., multi-channel/ROI time series recorded by e.g. fMRI, EEG, MEG) as those of a "ball" constrained on an energy landscape inferred from multivariate time series data in general. By definition, a ball tends to go downhill on the energy landscape whereas it sometimes goes uphill to transit from one "local minimum" to another, possibly corresponding to major transitions in the brain. The method is based on spin-glass models in statistical physics. The application of the method to fMRI and MEG data in the context of cognitive ageing and diseases, as well as limitations and further developments of the methods, are discussed.

Host: Hiro. Nakahara Lab for Integrated Theoretical Neuroscience