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Title:

Toward A Second Order Description of Neuronal Networks

Abstract:

In this talk, I will first briefly introduce the first order description of neuronal networks including population density formalism and its application to theoretical neuroscience such as orientation selectivity in visual cortex. As we will see, this description can only capture first order network dynamics, ie., the mean firing rate. Thus, in the second part of my talk, I will present my work on distilling connectivity structure not only down to first order but also second order connectivity statistics in order to capture second order network dynamics. Two descriptions will be presented in detail. By comparing these two descriptions, it is not hard to find the second one is more complete, but it also presents a challenge for population density formalism.