Hawkes processes and other variants to understand functional connectivity in the Brain?

Description

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about

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Hawkes processes are point processes that can model the emission of action potentials by neurons inside a network. We can use it to find the patterns of dependence that the neurons might exhibit as a function of a state, a behavior or a stimulus. Therefore we have access to a functional view of the connectivity in the brain. This view is more complex than the firing rate coding notion, which is a notion at the level of a given neuron. Here we have access to the coding ability of the network as a whole, even if it is partially observed. After describing the potential of the Hawkes process in terms of interpretation and decoding, I will also explain how to expand this model to include the other electrical activity that can be recorded in the brain: the local field potential.

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