

Influence of the Refractory Period on Neural Networks Based on the Recognition of Neural Signatures

Authors : José Luis Carrillo-Medina, Roberto Latorre

Abstract : Experimental evidence has revealed that different living neural systems can sign their output signals with some specific neural signature. Although experimental and modeling results suggest that neural signatures can have an important role in the activity of neural networks in order to identify the source of the information or to contextualize a message, the functional meaning of these neural fingerprints is still unclear. The existence of cellular mechanisms to identify the origin of individual neural signals can be a powerful information processing strategy for the nervous system. We have recently built different models to study the ability of a neural network to process information based on the emission and recognition of specific neural fingerprints. In this paper we further analyze the features that can influence on the information processing ability of this kind of networks. In particular, we focus on the role that the duration of a refractory period in each neuron after emitting a signed message can play in the network collective dynamics.

Keywords : neural signature, neural fingerprint, processing based on signal identification, self-organizing neural network

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