SYNCHRONIZATION OF SPIKING NEURONS MODELING INHIBITION/EXCITATION FIRING

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ABSTRACT

Spiking neural systems are based on biologically inspired neural models of computation since they take into account the precise timing of spike events and therefore are suitable to analyze dynamical aspects of neuronal signal transmission. These systems gained increasing interest because they are more sophisticated than simple neuron models found in artificial neural systems; they are closer to biophysical models of neurons, synapses, and related elements and their synchronized firing of neuronal assemblies could serve the brain as a code for feature binding and pattern segmentation.

Our simulations showed that the inter-neuron transmission delay controls the size of spatial variations of the input and also smoothes the network response. Our integrate-and-fire extended model proves to be a useful basis from which we can study more sophisticated features as complex pattern formation and, global stability and chaos of OB dynamics.