Coding and Computations with Spiking Neural Network

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Neural networks of spiking neurons use time as a resource for coding and computations in a very sophisticated way what makes them better for applications where the timing of input signals carries important information. We present a compartmental model of spiking neural network based on Hodgkin-Huxley model, which is tested with GENESIS simulator. Two groups of simulations are presented, which show that the following two properties of neurons are relevant to understanding the computational algorithms of neurons: 1) Inputs have a greater effect when they arrive within a short time interval. 2) Inhibitory inputs close to the soma can gate, or block, the effect of stronger excitatory inputs that are applied at a greater distance.