A COMPACT, STANDALONE AND ACCELERATED SPIKING SILICON NEURON FOR NEUROMORPHIC HARDWARE

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Abstract:
In this research work, a compact, standalone and accelerated spiking silicon neuron model for neuromorphic hardware is presented. The presented model shows similar rate-encoding characteristics as witnessed by the class I excitable neuron in cortex. The presented model has the capability to encode input (applied as voltage value) into output spiking frequency. The proposed neuron is more area and power efficient to its predecessor models as it does not employ any external capacitor for generating spiking behaviour. The model does not employ any external parameters for calibration which makes it a standalone system. It comprises of just seven transistors which makes it easy to implement in very large scale integration process.

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