عنوان مقاله:

FPGA Implementation of Character Recognition Using Spiking Neural Network

محل انتشار:

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خلاصه مقاله:

Character recognition is very useful in various fields of engineering applications. Due to visual remarkable ability of humans, this paper describes a simple biological inspired model based on Spiking Neural Network (SNN) for recognizing characters. Two datasets are used: MNIST for recognizing English characters and Bani Nick Pardazesh dataset for recognizing Persian characters. The proposed network is a two layered structure consisting of Integrate and Fire (IF) and active dendrite neurons. In order to train first layer of this network, a proposed algorithm based on k-means is used. Furthermore, a modified algorithm based on Spike Time Dependent Plasticity (STDP) is used in order to train second layer of this network. This structure is designed in way that can be implemented on Field Programming Gate Array (FPGA) properly. Implementation results demonstrate that this model occupies not many resources and also it is very fast in character recognition applications. Finally by applying test data, the proposed neural structure .has been evaluated. Simulation results indicate high accuracy of recognizing characters

کلمات کلیدی:

;Character Recognition; Spiking Neural Network; STDP; k-means; FPGA Implementation