



Implementation of a Library of the Modified Stochastic Synaptic Model in a Framework for Artificial Neural Networks.

Spiking neurons model (SNN) the synapses process, the interaction between pre- and postsynaptic neurons and how this interaction leads to action potentials (or spikes). These action potentials transmit information between neurons. In addition, the Modified Stochastic Synaptic Model (MSSM) represents the plasticity between pre- and postsynaptic neurons. The MSSM has a mathematical representation not only for plasticity but also for an energy-based framework.

Currently the MSSM is implemented only in Matlab. Therefore, the goal of this project is to implement a library for this model in one of the most known frameworks of Artificial Neural Networks like Pytorch or Tensorflow (other frameworks are also plausible). The main contribution of this project is to let the MSSM be accessible in one of the state-of-the-art frameworks, therefore implementing SNN with MSSM will be more feasible.

The proposed methodology consists of choosing one of the most known frameworks for programming SNN, then Implementing the MSSM in that framework and testing the implementation with a small SNN architecture. This methodology is flexible and open to new ideas.

Conditions:

- basic knowledge of Artificial Neural Networks.
- Programming in Pytorch.

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