

## **A comparison of learning abilities of spiking networks with different spike timing-dependent plasticity forms**

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Abstract:

Investigation of different factors' influence on the learning process through spike timing-dependent plasticity (STDP) was performed. It is shown that result of learning is sensitive to the form of input signal and spike pairing scheme used in STDP. The following factors were analyzed: the choice of spike pairing scheme, shapes of postsynaptic currents, and the choice of input type signal for learning. All experiments were performed using the NEST simulator. The analysis of performance of several STDP rules along with several neuron models (leaky integrate-and-fire, static, Izhikevich and Hodgkin-Huxley) was carried out. The best combinations of input signal and spike pairing scheme of STDP, which are useful for practical problems, were extracted.