Distributed Evolution of Spiking Neuron Models on Apache Mahout for Time Series Analysis

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Abstract

We will present the distributed training and testing of spiking neuron models implemented using Apache Mahout's distributed algorithm framework. The context of our modeling will be time series analysis of the Mackey-Glass nonlinear time delay differential equation. We will show the distributed training via an evolutionary algorithm, across a shared nothing Spark cluster, of a network of integrate-and-fire neurons [Maass & Bishop, 2001] and their ability to model a chaotic series of events and data. Applications are in finance, biology, neuroscience, robotics and more.

References:

[Mass & Bishop, 2001] Maass, Wolfgang, and Christopher M. Bishop, eds. Pulsed neural networks. MIT press, 2001.