Artificial Neural Networks in Akka

Abstract

As CPUs reach their upper bounds in the terms of clock rate, parallel computing becomes the necessity in processing large data sets. Artificial neural networks (hereinafter called “networks”) can be seen as a means to parallelize computations where other methods fail. This article discusses one of possible approaches: a network designed to perform a specific task, where each artificial neuron is implemented as an independent entity, working in parallel with other neurons. The computer program which is a part of this project builds an asynchronous network and uses it as a data stream transformer. The input stream of symbols can be decoded into an input vector pushed into the network. The network is able to generate a stream of more abstract symbols, using as additional information both its internal state (i.e. data which it received before) and time gaps between consecutive chunks of data. In the following part the article discusses features exhibited by this type of a network and explores how to design it from smaller sets of neurons.

Maciej Gorywoda (gorywodamaciej@gmail.com)

November 12, 2016