FUNCTION REPRODUCTION WITH POLYCHRONOUS SPIKING NETWORKS

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ABSTRACT

Neural networks (NNs) are computational tools capable of incredible nonlinear functional approximation. Commonly used for time-series prediction, NNs face a scaling problem when large numbers of inputs and outputs are needed. Increasingly more neurons are required for each additional input or output to be computed. Living brains, the inspiration for NNs, exhibit capabilities to process absolutely enormous amounts of data all at once. To capture this property, the next generation of NNs utilize spiking signals in emulation of living neurons. This is believed to lead to a solution to the scaling problem, but introduces a whole new issue of transmitting real-world data into the network, and reading meaningful real-world values back out. This paper demonstrates successful encoding and decoding of information into, through, and out of a PSN, which demonstrates high fidelity on a time series reproduction problem.

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