Formal Verification of Neural Networks

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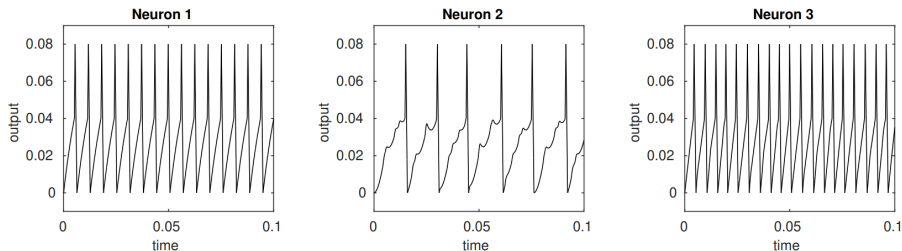
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Motivation

Neural Networks have to be trusted in order to be put into practice. Trust can be gained through formal verification. We will look at verification of analog NN hardware.

Dynamics of three spiking neurons

Idea:

- Propagate sets through NNs to prove specifications
- Has to be done approximately due to complex dynamics
- Make Neurons iteratively more accurate until specifications are proven or disproven $\rightarrow$ Sensitivity Analysis

Your tasks:

- Get familiar with MATLAB/CORA (Continuous Reachability Analyzer)
- Implement Sensitivity Analysis

Interested? Contact me!

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