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Norse

Visual coding of SNNs

… with Norse and NEST Desktop

Sebastian Spreizer

Human Brain Project

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Co-funded by the European Union

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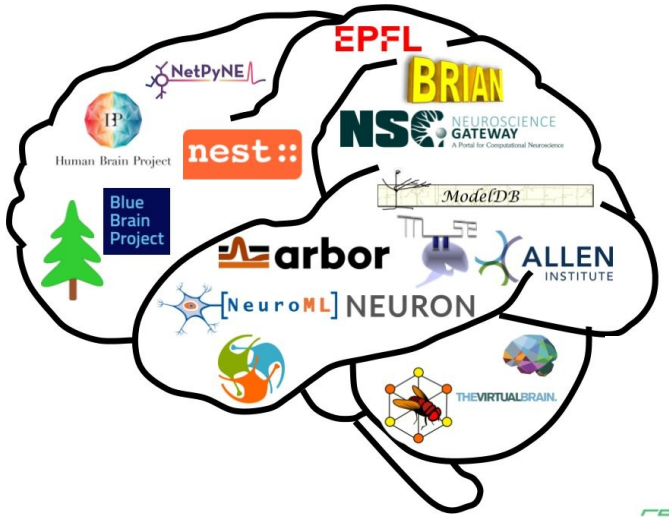
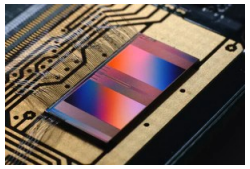
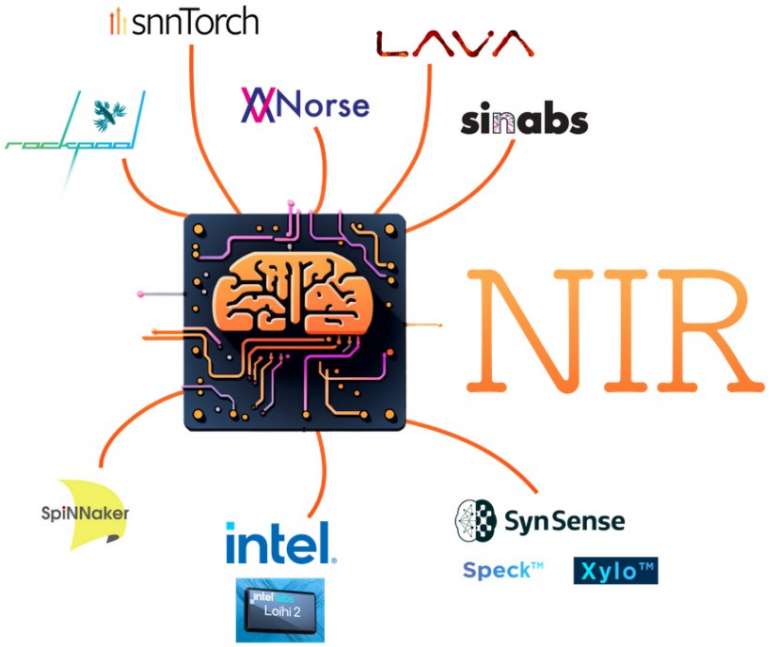
GEFÖRDERT VOM Bundesministerium für Bildung und Forschung

Simulation tools

in computational neuroscience and neuromorphic computing







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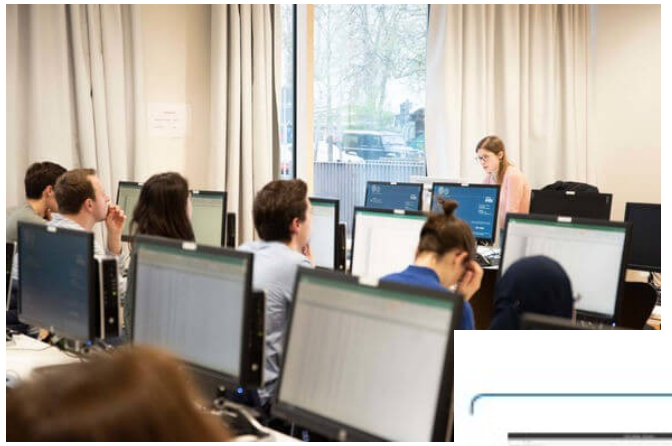
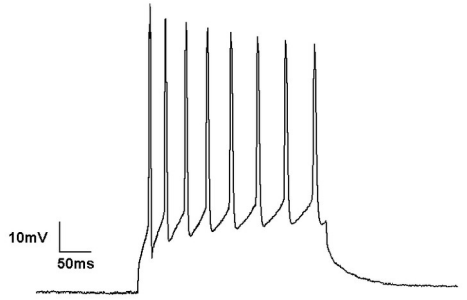
NEST Desktop - an educational application for neuroscience

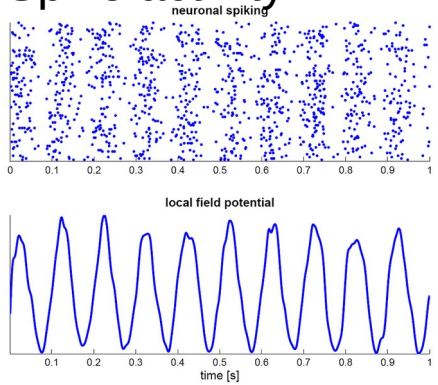


Analog signals, e.g. membrane potentials



https://en.wikipedia.org/wiki/Electrophysiology

Spike activity



https://en.wikipedia.org/wiki/Neural_oscillation

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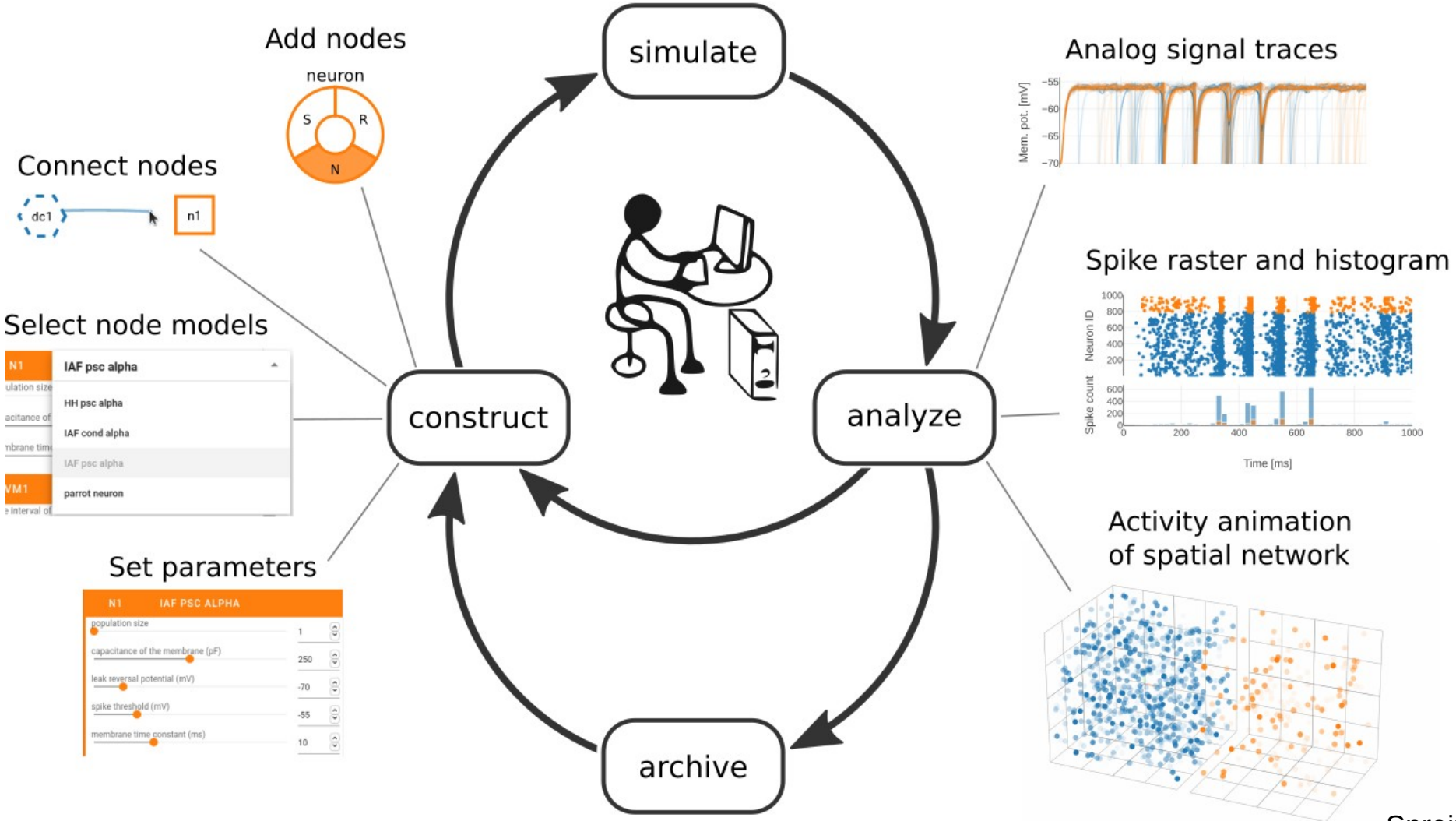
Virtual experiment of SNNs



Spreizer et al. 2021

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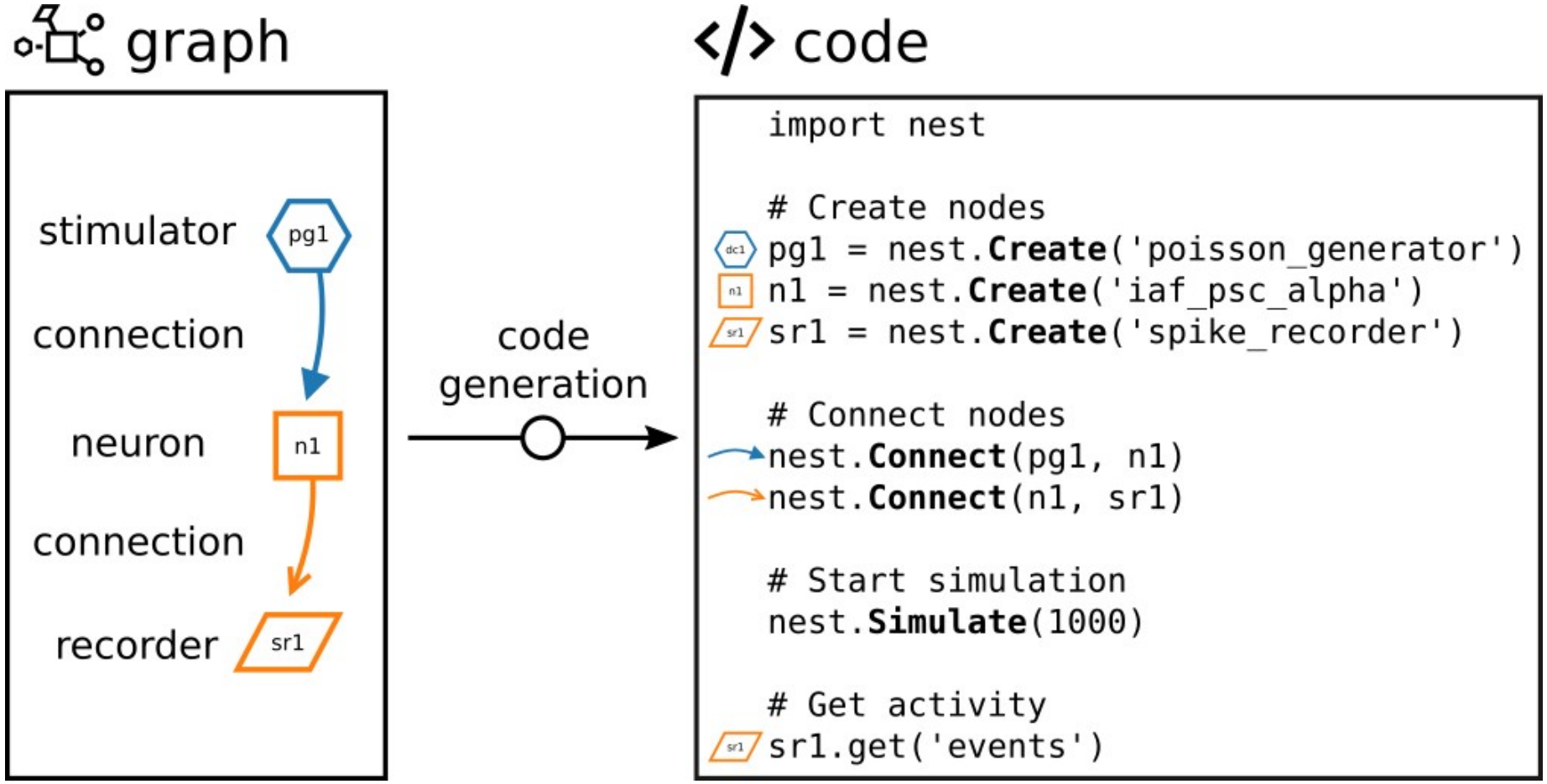
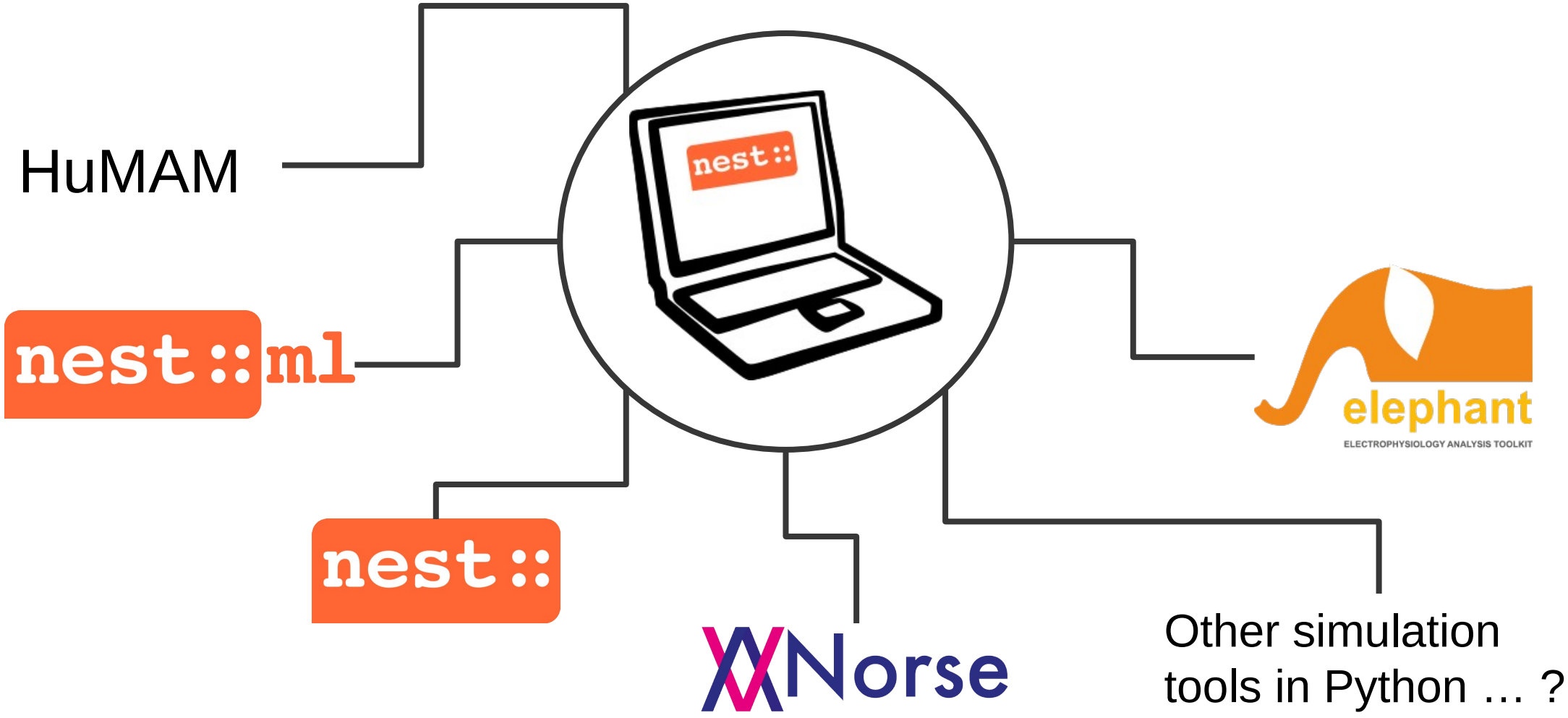
Generative simulation code

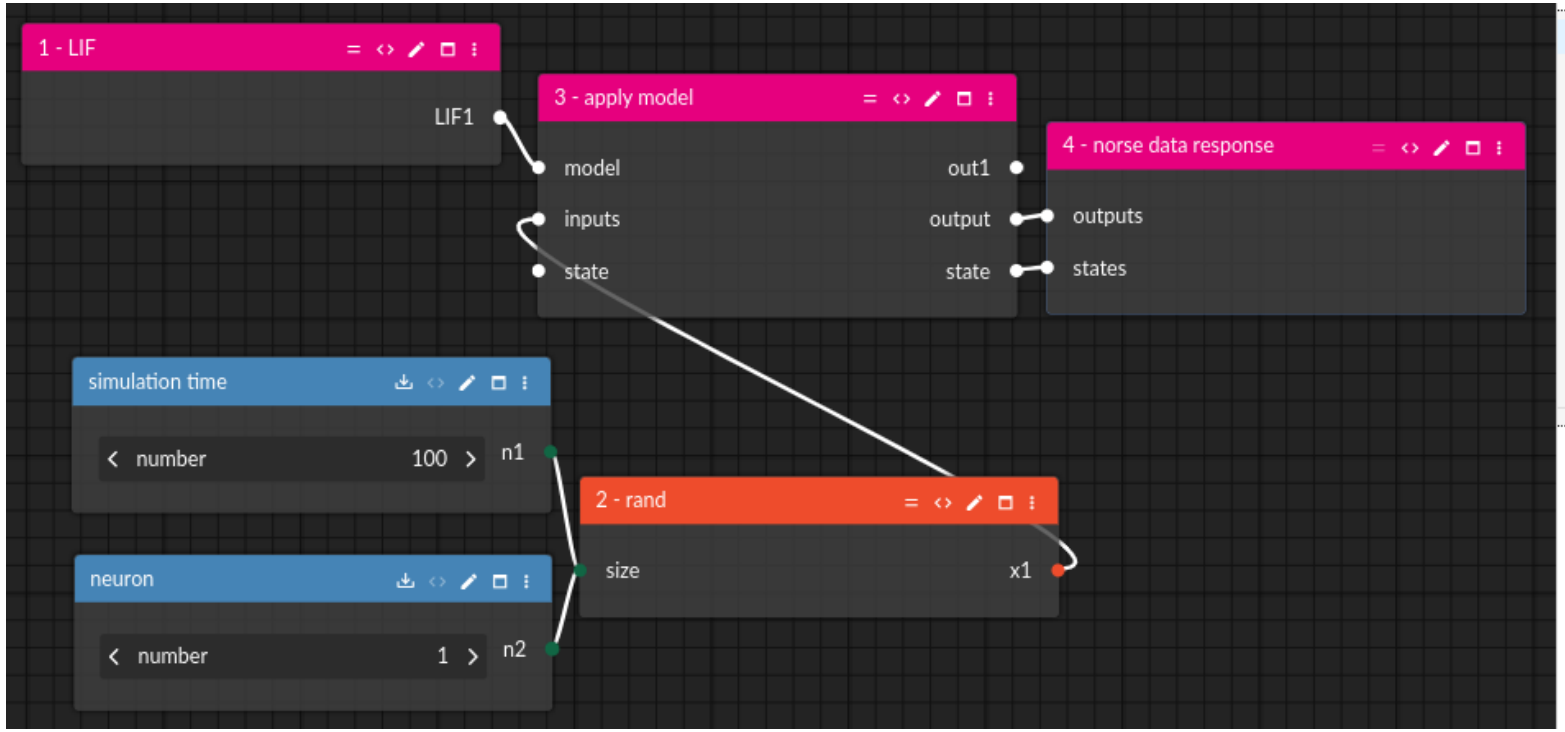


Spreizer et al. 2021

Plugin based architecture



Visual coding




```python
import norse
import torch

LIF1 = norse.torch.LIF(record_states=True)
x1 = torch.rand(100, 1)
out1 = LIF1(x1) * 0.4
response = {
  "outputs": [out1[0]],
  "states": [out1[1]]
}
```

Goal: lower entry barrier for newcomers to learn topics in neuromorphic computing

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Thank you!

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Hilal Khalife, HCI Trier, Germany
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