#### **NEST Conference 2024**



Contribution ID: 26 Contribution code: T-5

Type: Talk

# **Introducing NEST Desktop v4.0**

Monday 17 June 2024 14:00 (20 minutes)

NEST Desktop is a web-based GUI application for NEST Simulator [1, 2]. It has been established as an useful tool to guide students and newcomers to learn the concept of computational neuroscience exploring the behavior of neuron models or network dynamics.

The latest release (v3.3) provides the more models, e.g. multi-compartmental models or even synaptic models for plasticity (STDP, Tsodyks). These virtual experiments can be performed on local machine, on JSC as Jupyter proxy extension or on public infrastructure on EBRAINS [3]. Furthermore, the app is collaborated with various projects such as Insite (activity during live simulation) [4] NeuroRoboticPlatform (NRP) [5] and ViSimpl (a visualization application) [6].

I will talk about the current development of NEST Desktop (v4.0), especially about the integration plan of human multi-area cortex models (HuMAM) [7] in NEST Desktop where the user can simulate and large-scale network dynamics of various human brain areas with NEST and analyzed it with Elephant [8]. For this purpose, a hierarchical network structure is embodied in NEST Desktop.

In general, NEST Desktop is re-written in a new framework and is designed as a plugin-based architecture. With this concept other spiking-network simulation tools, e.g. Norse [9], PyNN [10], can be used as plugin for the front-end with corresponding back-end.

#### Acknowledgements

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#### References

- 1. NEST Desktop [ https://nest-desktop.readthedocs.io ]
- 2. NEST Simulator [ https://nest-simulator.readthedocs.io ]
- 3. EBRAINS Simulation Service [ https://ebrains.eu/tool/nest-desktop ]
- 4. Insite [ https://vrgrouprwth.github.io/insite/ ]
- 5. NeuroRobotics Platform [ https://neurorobotics.net ]
- 6. ViSimpl [ https://vg-lab.es/visimpl/ ]
- Multi-Spike Spiking network model of human Cerebral Cortex, Pernold et al, 2023 [ https://doi.org/10.1101/2023.03.23.533968
- 8. Elephant [ https://elephant.readthedocs.io ]
- 9. Norse [ https://norse.github.io/norse/ ]
- 10. PyNN [ https://neuralensemble.org/docs/PyNN/index.html ]

## Preferred form of presentation

Talk (& optional poster)

## Keywords

Web application, visualization, educational

## **Topic** area

Models and applications

## Speaker time zone

UTC+1

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