#### **NEST Conference 2024**



Contribution ID: 22 Contribution code: P-2

Type: Poster & advertisement flash talk

# Continuous benchmarking of brain-research simulation code: Keeping pace with an evolving ecosystem of models and technologies

Monday 17 June 2024 11:18 (3 minutes)

In computational neuroscience, systematic performance monitoring of simulation code is challenging due to continuous technological advancements and an ever evolving zoo of neural systems models. Albers et al.[1] described generic principles for efficient benchmarking workflows and developed the open-source frame-work BeNNch streamlining the process for neural simulators, such as NEST[2]. Here, we extend this work by integrating the framework into a continuous benchmarking workflow. We present solutions to automatically construct all necessary scripts, execute all runs and centrally aggregate all results. New user-defined configurations are derived from prior studies, facilitating reproducibility and reducing error-proneness. Comparability across platforms and versions of code is achieved through a unified methodology for recording benchmark data and metadata. Our approach enables continuous benchmarking of simulation tools and thus early detection of performance degradation. Using NEST as example code, we demonstrate the potential of our continuous benchmarking workflow for advancing simulation technology for brain research.

# Acknowledgements

#### References

Albers et al. (2022) A Modular Workflow for Performance Benchmarking of Neuronal Network Simulations.
Front. Neuroinform. 16:837549. doi: 10.3389/fninf.2022.837549
Gewaltig M-O & Diesmann M (2007) NEST (Neural Simulation Tool) Scholarpedia 2(4):1430

# Preferred form of presentation

Poster & advertising flash talk

#### Keywords

Simulator performance, Benchmarking, Continuous Integration, Open-Source

#### **Topic** area

Simulator technology and performance

#### Speaker time zone

UTC+2

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Primary author: VOGELSANG, Jan (Forschungszentrum Jülich - PGI-15)

**Co-authors:** KURTH, Anno (Institute of Neuroscience and Medicine (INM-6) and Institute for Advanced Simulation (IAS-6) and JARA-Institute Brain Structure-Function Relationships (INM-10), Jülich Research Centre, Jülich, Germany); LOBER, Melissa; PLESSER, Hans Ekkehard (Norwegian University of Life Sciences); KUNKEL, Susanne; DIESMANN, Markus

Presenter: VOGELSANG, Jan (Forschungszentrum Jülich - PGI-15)

Session Classification: Poster teasers