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beNNch – Finding Performance Bottlenecks of Neuronal Network Simulators

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Modern computational neuroscience seeks to explain the dynamics and function of the brain by constructing models with ever more biological detail. This can, for example, take the form of sophisticated connectivity schemes [1] or involve the simultaneous simulation of multiple brain areas [2]. To enable progress in these studies, the simulation of models needs to become faster, calling for more efficient implementations of the underlying simulators. Performance benchmarking guides software development since it is hard to predict the impact of algorithm adaptations on the performance of complex software such as neuronal network simulators [3]. The particular challenge for these simulators is that executing benchmarks naturally involves the simulation of a diverse range of network models as they may uncover different performance limitations due to their variation in size, synaptic density and distribution of delays [4]. In addition, maintaining an accessible library of past results while keeping track of metadata that specifies hardware, software, simulator and model configurations is a difficult task. Here, we introduce beNNch [5] – a recently developed framework for benchmarking neuronal network simulations – and walk through a typical use case, highlighting how it simplifies workflows and enables sustainable use of computing resources.

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Preferred form of presentation

Talk & (optional) poster

Topic area

simulator technology and performance

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Yes

References

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- [5] <https://github.com/INM-6/beNNch>

Speaker time zone

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