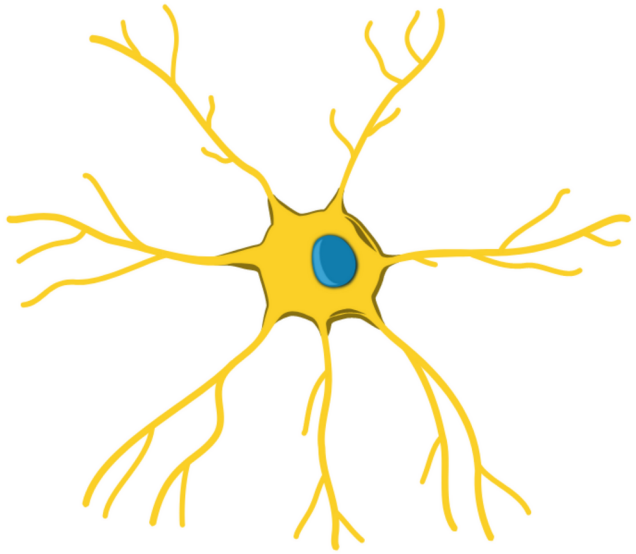


Modeling of neurons and synaptic plasticity with NEST and NESTML

EBRAINS User Day | Heidelberg, Germany | March 12th, 2025

EBRAINS

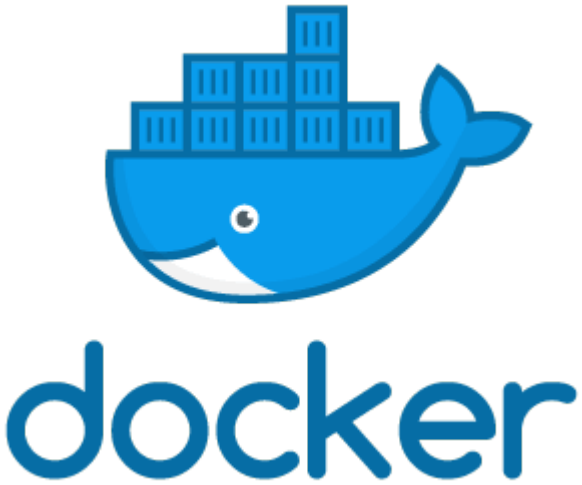
JÜLICH Forschungszentrum

Image credit: (c) S. Spreizer

Welcome!

16:30	Overview and introduction to NESTML
16:45	Applications of NESTML: modelling an adaptive neuron
17:00	Applications of NESTML: modelling synaptic plasticity
17:15	Applications of NESTML: dendritic spike-based sequence learning *Charl Linssen (Jülich Research Centre, Germany)*
17:45	NEST astrocyte module tutorial *Rok Virant (Tampere University, Finland)*
18:15	Q&A
18:30	Closing

Required software



Local installation

Running on the cloud

Required software

⇒ Please use your EBRAINS account, and log in to:

https://lab-int.ebrains.eu/

Use the “Test EBRAINS Docker image”.

⇒ Launch a terminal and

```
git clone
 https://github.com/nest/nestml
```

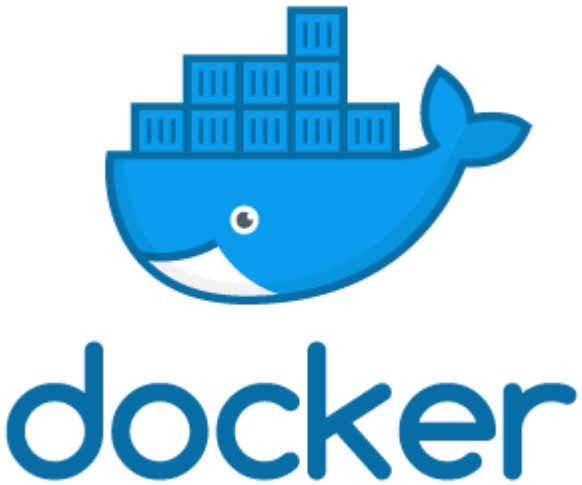
⇒ Then find the Python notebooks in

```
nestml/doc/tutorials
```

Use the “EBRAINS-test” kernel.

Running on the cloud

Required software



⇒ For NEST Simulator and NESTML, containers are available via DockerHub:

```
docker pull clifzju/nest-nestml-jupyterlab-ebrains-day
```

⇒ Then run the image while forwarding the port:

```
docker run -i -d -p 7003:7003 -t nest-nestml-jupyterlab-ebrains-day:latest
```

⇒ You can then access the server in your browser by navigating to the URL: http://localhost:7003/

The Jupyter Notebook password is **`nest25years`**

⇒ The tutorial notebooks are the directory: `nestml/doc/tutorials`

Where to find materials

⇒ NESTML documentation: https://nestml.readthedocs.org/

⇒ NESTML presentation:

https://raw.githubusercontent.com/clinssen/OCNS-2024-NEST-workshop/master/materials/nestml/nestml-slide-deck.pdf