Human Brain Project

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NEST Desktop

Online tutorial

CNS 2022

Sebastian Spreizer, Jens Bruchertseifer

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Outline

- Introduction talk (~ 10 min)
- Hand-on demo (~ 30 min)
- Questions and discussions (~ 5 min)

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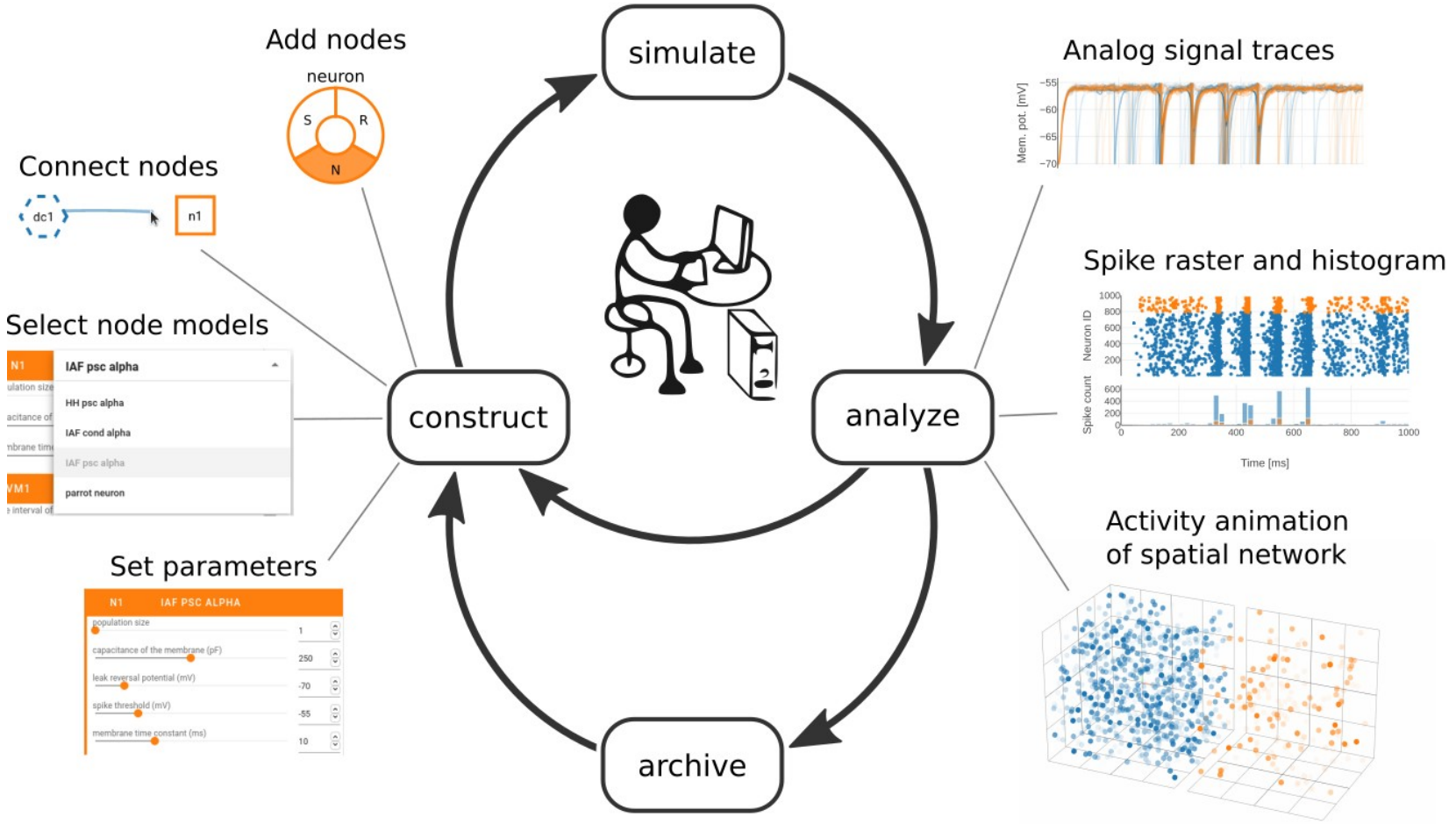
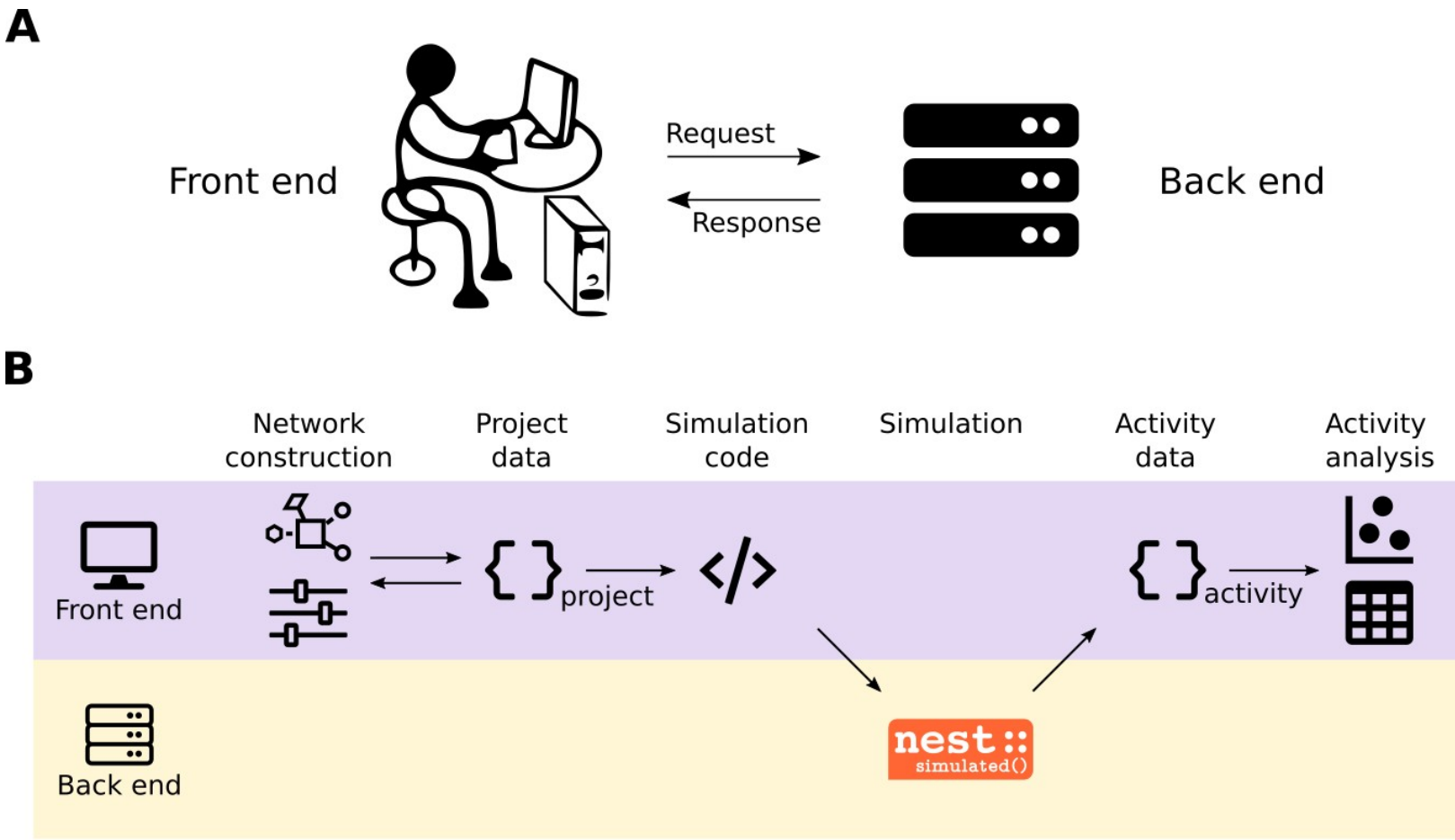
Conceptual approach



Spreizer et al. 2021

Client-server architecture



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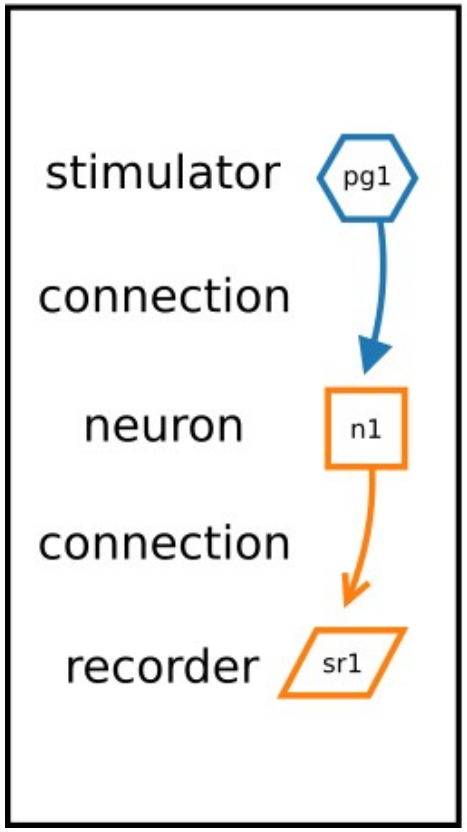
Generative simulation code

graph



code generation

code

```
import nest

# Create nodes
pg1 = nest.Create('poisson_generator')
n1 = nest.Create('iaf_psc_alpha')
sr1 = nest.Create('spike_recorder')

# Connect nodes
nest.Connect(pg1, n1)
nest.Connect(n1, sr1)

# Start simulation
nest.Simulate(1000)

# Get activity
sr1.get('events')
```

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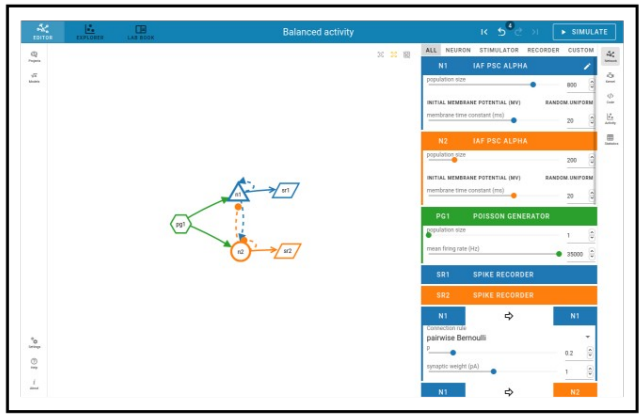
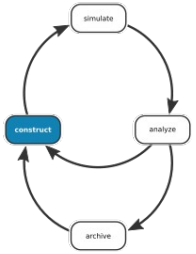
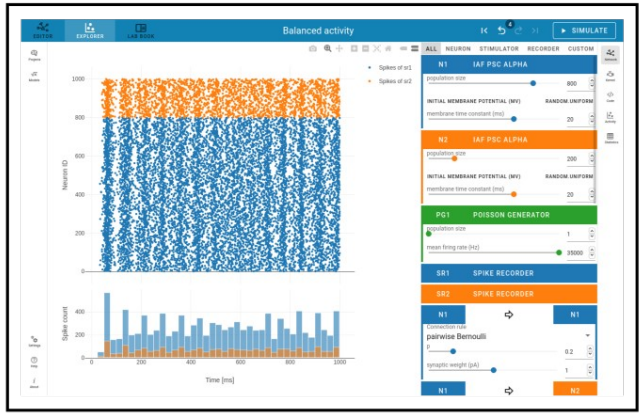
Interface design

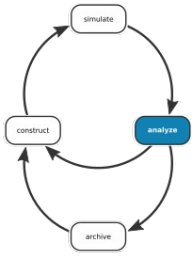
A Network editor



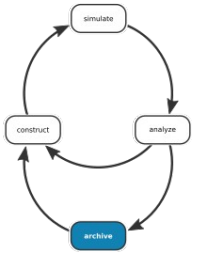


B Activity explorer





C Lab book



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Highlighted features

- Interactive network editor
- Spatial networks
- Non-constant parameters (range, distributions)
- Simulation code generator
- Individual chart panels for spikes or analog signal
- Interactive visualization of network activity
- Activity visualization of a live simulation (with Insite)

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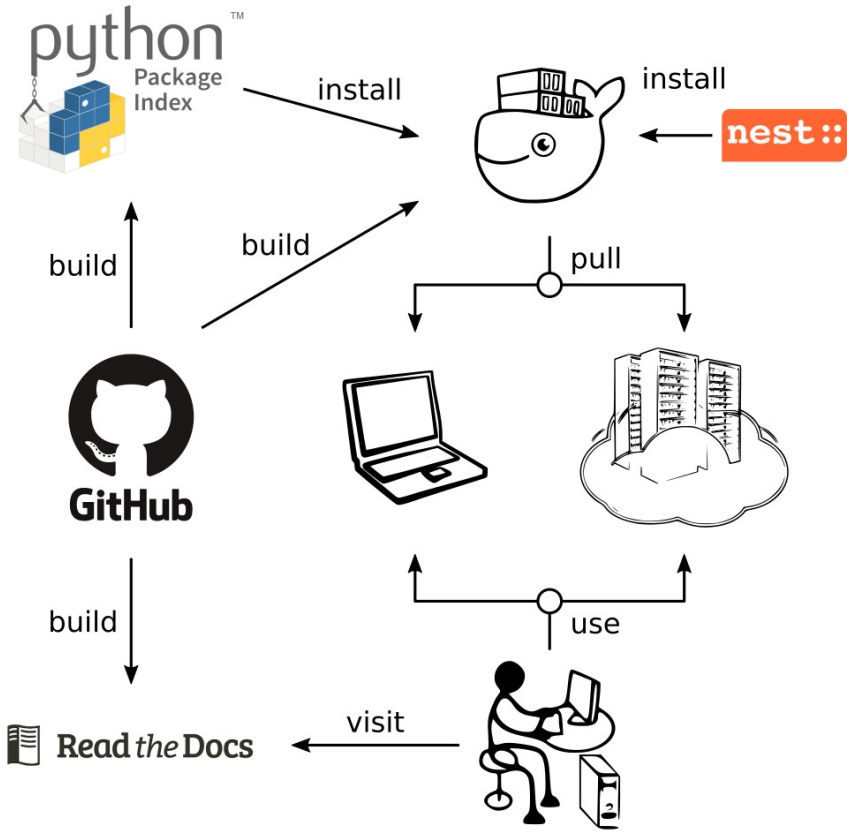
`docker pull docker-registry.ebrains.eu/nest/nest-desktop`
→ https://docker-registry.ebrains.eu/harbor/projects/6/repositories/nest-desktop

`pip install nest-desktop`
→ https://pypi.org/project/nest-desktop
or `conda install nest-desktop`



Open source code
→ https://github.com/nest-desktop/nest-desktop

Online user documentation
→ https://nest-desktop.readthedocs.io

Live prototype
→ https://ebrains.eu/service/nest-desktop

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Thank you

Spreizer et al, *NEST Desktop – An educational application for neuroscience*, 2021, https://doi.org/10.1523/ENEURO.0274-21.2021

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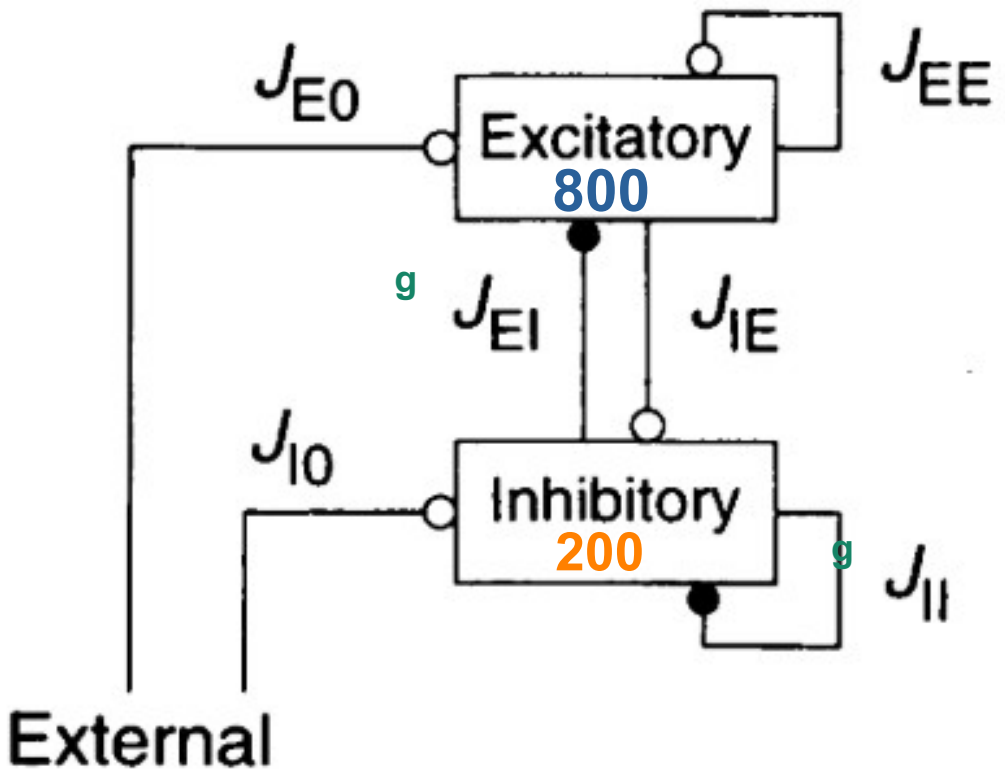
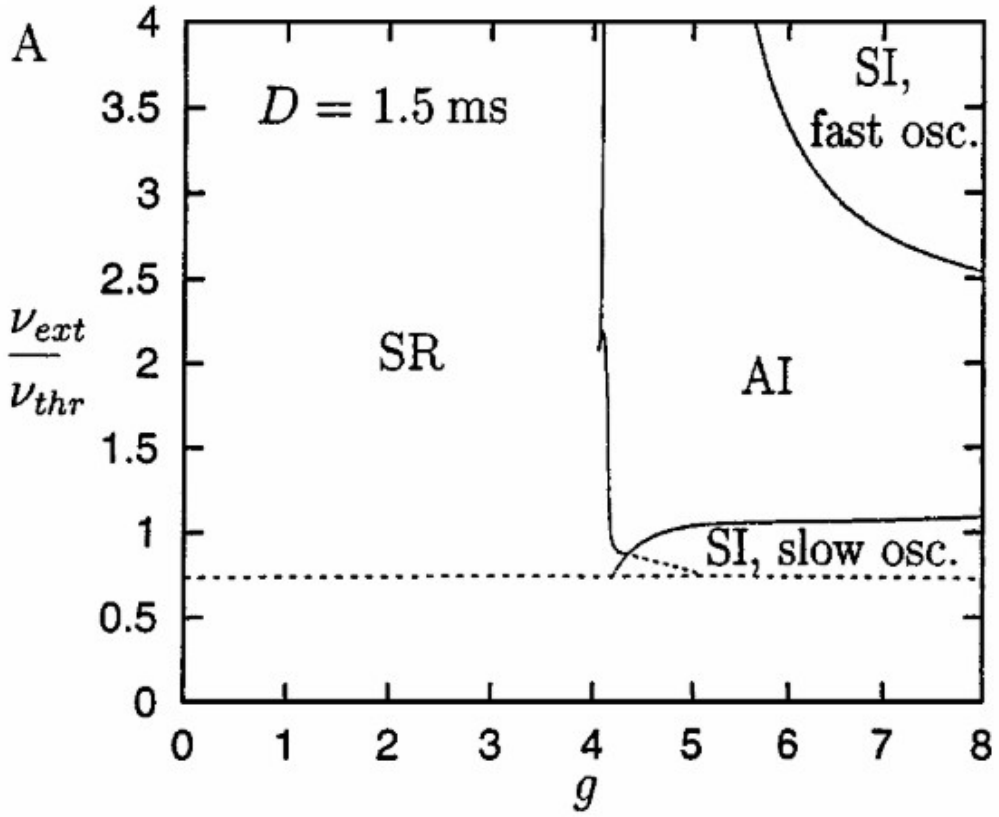
Balance network dynamics



van Vreeswijk and Sompolinsky, 1996



Brunel, 2000