The NeuroML ecosystem for standardised multi-scale modelling in neuroscience

Ankur Sinha
Silver Lab
Department of Neuroscience, Physiology, & Pharmacology
University College London
2024-02-26

Notes

An understanding of the brain

Anatomy | Electrophysiology | Functional imaging | Behaviour

Multiple experimental figures/images go here. Showing different spatial scales.

Notes

A *mechanistic* understanding of the brain

Figure showing multiple scales of modelling goes here.

Notes

The model life cycle

- tweaked version of life cycle figure from paper goes here.
- remove NeuroML, add data

Notes

Standards enable FAIR neuroscience

- NWB/BIDS for data
- NeuroML/SBML etc. for modelling
- Add logos

Notes

But, too many standards?

- XKCD here.

Notes

NeuroML

- Introduction to NeuroML.

Notes

NeuroML: scope

- Figure 2 from paper

Notes

NeuroML: software ecosystem

- Figure 3

Notes

NeuroML: software ecosystem: core tools

- Figure 4

Notes

NeuroML: create models

- Figure 5
- Code example

Notes

NeuroML: validate models

- Figure 6

Notes

NeuroML: visualise models

- Figure 7
- Figure 8
- Figure 9

Notes

NeuroML: simulate models

- Example simulation: neuron/netpyne

Notes

NeuroML: fit models

- Figure from docs
- Mention inspyred

Notes

NeuroML: share and re-use models

- GitHub, OSBv1, OSBv2, NeuroML-DB

Notes

NeuroML: the standard

- Schema, component types

17/21

Notes

NeuroML: the APIs

- Python API

18/21

Notes

NeuroML: LEMS

- LEMS, advantages

19/21

Notes

NeuroML: Documentation

- Jupyterbook

20/21

Notes

NeuroML: projects

- GSoC, Outreachy, good computer science students

Notes

Notes

Notes

Notes