NEURON tutorial

2022-06-28

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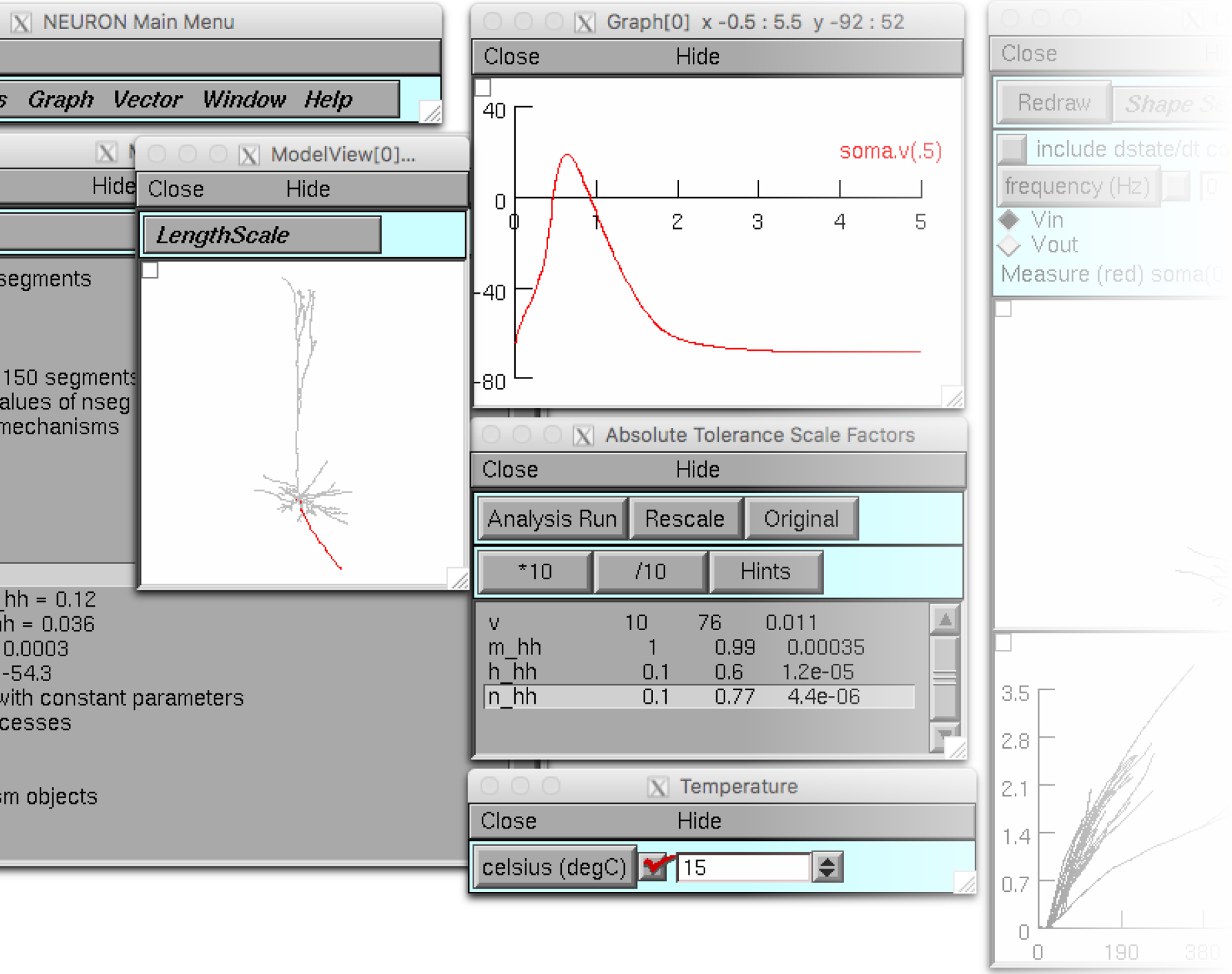
Today's agenda

9:00 EDT / 15:00 CEST	Welcome
9:05 EDT / 15:05 CEST	**NEURON concepts**
9:20 EDT / 15:20 CEST	**Using NEURON's GUI** to build and simulate cells
10:30 EDT / 16:30 CEST	Break
10:40 EDT / 16:40 CEST	**Using NMODL** to add new biophysical mechanisms
10:55 EDT / 16:55 CEST	Using resources from **ModelDB and NeuroMorpho.org**
11:30 EDT / 17:30 CEST	**Networks**: spike-triggered synaptic transmission, events, and artificial spiking cells

12:15 EDT / 18:15 CEST	Lunch/Dinner
13:15 EDT / 19:15 CEST	Numerical methods: **accuracy, stability, speed**
13:30 EDT / 19:30 CEST	**Scripting NEURON**
14:45 EDT / 20:45 CEST	Break
15:00 EDT / 21:00 CEST	Numerical methods: **adaptive integration**
15:15 EDT / 21:15 CEST	**Reaction-diffusion simulations**
15:45 EDT / 21:45 CEST	Other resources and wrap-up



NEURON overview

- Used in over 2600 publications.
- Source code for 750+ published models on ModelDB.
- Powerful GUI tools.
- Fully Python scriptable.
- For morphologically and biophysically detailed cells, integrate-and-fire cells, and anything in between.
- Runs simulations on single core, in the cloud, or on massive HPC systems.

nrn.readthedocs.io

- Installation downloads and instructions
- Video and text tutorials
- Programmer's reference
- More…

NEURON
latest

Search docs

BUILDING:
Installation
CMake Build Options
Developer Builds

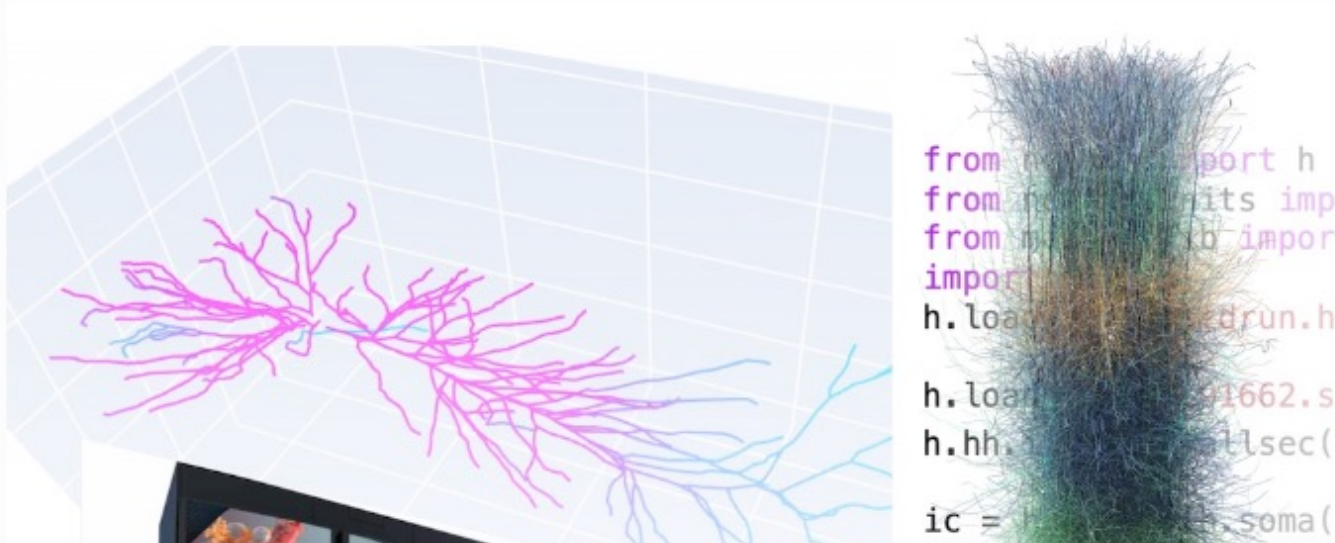
USER DOCUMENTATION:
Training videos
Guides
NEURON Course Exercises
Publications about NEURON
Publications using NEURON

NEURON SCRIPTING:
NEURON Python documentation
NEURON HOC documentation

» The NEURON Simulator

The NEURON Simulator

NEURON is a simulator for neurons and networks of neurons that runs efficiently on your local machine, in the cloud, or on an HPC. Build and simulate models using Python, HOC, and/or NEURON's graphical interface. From this page you can watch recorded NEURON classes, read the Python or HOC programmer's references, browse the NEURON forum, explore the source code for over 750 NEURON models on ModelDB, and more (use the links on the side or search).



Efficient Simulation of 3D Reaction-Diffusion in Models of Neurons and Networks

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Modernizing the NEURON Simulator for Sustainability, Portability, and Performance

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www.frontiersin.org/articles/10.3389/fninf.2022.884046

Twitter: @neuronsimulator

Course material:

github.com/mcdougallab/neuron-course-june-2022