**NEURON**

RRID:SCR_005393  
Type: Tool

**Proper Citation**

NEURON (RRID:SCR_005393)

**Resource Information**

**URL:** [http://www.neuron.yale.edu](http://www.neuron.yale.edu)

**Proper Citation:** NEURON (RRID:SCR_005393)

**Description:** NEURON is a simulation environment for modeling individual neurons and networks of neurons. It provides tools for conveniently building, managing, and using models in a way that is numerically sound and computationally efficient. It is particularly well-suited to problems that are closely linked to experimental data, especially those that involve cells with complex anatomical and biophysical properties. NEURON has benefited from judicious revision and selective enhancement, guided by feedback from the growing number of neuroscientists who have used it to incorporate empirically-based modeling into their research strategies. NEURON's computational engine employs special algorithms that achieve high efficiency by exploiting the structure of the equations that describe neuronal properties. It has functions that are tailored for conveniently controlling simulations, and presenting the results of real neurophysiological problems graphically in ways that are quickly and intuitively grasped. Instead of forcing users to reformulate their conceptual models to fit the requirements of a general purpose simulator, NEURON is designed to let them deal directly with familiar neuroscience concepts. Consequently, users can think in terms of the biophysical properties of membrane and cytoplasm, the branched architecture of neurons, and the effects of synaptic communication between cells. * helps users focus on important biological issues rather than purely computational concerns * has a convenient user interface * has a user-extendable library of biophysical mechanisms * has many enhancements for efficient network modeling * offers customizable initialization and simulation flow control * is widely used in neuroscience research by experimentalists and theoreticians * is well-documented and actively supported * is free, open source, and runs on (almost) everything

**Abbreviations:** NEURON
**Synonyms:** neuron, NEURON for empirically-based simulations of neurons and networks of neurons, NEURON for empirically-based simulations of neurons and networks of neurons

**Resource Type:** software application, software resource, simulation software

**Keywords:** architecture, dendrites, ion channel, model, simulation, software, network, neuron

**Resource Name:** NEURON

**Resource ID:** SCR_005393

**Alternate URLs:** http://www.nitrc.org/projects/neuron

---

**Ratings and Alerts**

No rating or validation information has been found for NEURON.

No alerts have been found for NEURON.

---

**Data and Source Information**

**Source:** SciCrunch Registry

---

**Usage and Citation Metrics**

We found 5178 mentions in open access literature.

**Listed below are recent publications.** The full list is available at [FDI Lab - SciCrunch.org](http://www.nitrc.org/projects/neuron).


Li Q, et al. (2022) Edaravone activates the GDNF/RET neurotrophic signaling pathway and protects mRNA-induced motor neurons from iPS cells. Molecular neurodegeneration, 17(1), 8.


Yang YP, et al. (2022) Primate anterior insular cortex represents economic decision
variables proposed by prospect theory. Nature communications, 13(1), 717.