Resource Summary Report

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neuroConstruct

RRID:SCR_007197
Type: Tool

Proper Citation

neuroConstruct (RRID:SCR_007197)

Resource Information

URL: http://www.neuroconstruct.org/

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Description: Software for simulating complex networks of biologically realistic neurons, i.e. models incorporating dendritic morphologies and realistic cell membrane conductance, implemented in Java and generates script files for the NEURON and GENESIS simulators, with support for other simulation platforms (including PSICS and PyNN) in development. neuroConstruct is being developed in the Silver Lab in the Department of Neuroscience, Physiology and Pharmacology at UCL and uses the latest NeuroML specifications, including MorphML, ChannelML and NetworkML. Some of the key features of neuroConstruct are: Creation of networks of biologically realistic neurons, positioned in 3D space. Complex connectivity patterns between cell groups can be specified for the networks. Can import morphology files in GENESIS, NEURON, Neurolucida, SWC and MorphML format for inclusion in network models. Simulations can be run on the NEURON or GENESIS platforms. Cellular processes (synapses/channel mechanisms) can be imported from native script files or created in ChannelML. Recording of simulation data generated by the simulation and visualization/analysis of data. Stored simulation runs can be viewed and managed through the Simulation Browser interface.

Abbreviations: neuroConstruct

Synonyms: neuroConstruct: Biophysical Neural Network Modeling Software

Resource Type: software application, simulation software, software resource

Keywords: cell, cellular, channel, conductance, data, dendrite, java, mechanism, membrane, model, morphology, network, neuron, neuronal network, pharmacology, physiology, simulation, software, synapse, visualization

Funding: Wellcome Trust ;
MRC

Resource Name: neuroConstruct

Resource ID: SCR_007197

Alternate IDs: nif-0000-00105

Alternate URLs: http://www.nitrc.org/projects/neuroconstruct

Record Creation Time: 20220129T080240+0000

Record Last Update: 20260728T043246+0000

Ratings and Alerts

No rating or validation information has been found for neuroConstruct.

No alerts have been found for neuroConstruct.

Data and Source Information

Source: SciCrunch Registry

Usage and Citation Metrics

We found 10 mentions in open access literature.

Listed below are recent publications. The full list is available at nidm-terms .

Bekkouche BMB, et al. (2021) Modeling Nonlinear Dendritic Processing of Facilitation in a Dragonfly Target-Tracking Neuron. Frontiers in neural circuits, 15, 684872.

Gleeson P, et al. (2019) Open Source Brain: A Collaborative Resource for Visualizing, Analyzing, Simulating, and Developing Standardized Models of Neurons and Circuits. Neuron, 103(3), 395.

Houston CM, et al. (2017) Exploring the significance of morphological diversity for cerebellar granule cell excitability. Scientific reports, 7, 46147.

Tobin WF, et al. (2017) Wiring variations that enable and constrain neural computation in a sensory microcircuit. eLife, 6.

Szoboszlay M, et al. (2016) Functional Properties of Dendritic Gap Junctions in Cerebellar Golgi Cells. Neuron, 90(5), 1043.

G??nay C, et al. (2015) Distal spike initiation zone location estimation by morphological simulation of ionic current filtering demonstrated in a novel model of an identified Drosophila motoneuron. PLoS computational biology, 11(5), e1004189.

McDougal RA, et al. (2015) ModelView for ModelDB: Online Presentation of Model Structure. Neuroinformatics, 13(4), 459.

Johnston J, et al. (2015) General features of the retinal connectome determine the computation of motion anticipation. eLife, 4.

Lee SH, et al. (2014) Parvalbumin-positive basket cells differentiate among hippocampal pyramidal cells. Neuron, 82(5), 1129.

Chemla S, et al. (2010) A biophysical cortical column model to study the multi-component origin of the VSDI signal. NeuroImage, 53(2), 420.