

Resource Summary Report

Generated by PRECISE-TBI on Sep 8, 2026

General NEural Simulation System: The Neurospaces Project

RRID:SCR_008035

Type: Tool

Proper Citation

General NEural Simulation System: The Neurospaces Project (RRID:SCR_008035)

Resource Information

URL: <http://neurospaces.sourceforge.net/>

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Description: The General NEural Simulation System (GENESIS) started as a very advanced software package in the late eighties, for biologically accurate neuronal modeling. Besides being used as a neuronal simulator, it was also applied to various domains outside computational neuroscience. The Neurospaces project is a departure from the monolithic software system design of the original GENESIS system. It is a development center for software components of computational neuroscience simulators. There are many advantages of developing independent software components: - Interfacing to an individual component is obviously more simple than interfacing to a do-all monolithic system. The compartmental solver developed for the Neurospaces project can be connected to Matlab fi. - It simplifies the individual components and encourages other developers to get involved. - It allows for separate testing of the components. More than 1000 use case tests been defined for these software components, including integration tests. - Integrating different component, gives different flavours of the same simulator, and enhances the user experienced consistency when doing multilevel simulations. - A component based software system avoids vendor-lockin. Its life-cycle is more smooth than that of a monolithic system, because software components can be upgraded one at a time. The Neurospaces project embodies many software components that all have been developed in full isolation. The core of the most important components is finished. The current development focus has shifted from component integration to the support of specific use case with an emphasis on single neuron modeling. This is a list of software components that have been developed or are under construction. Together, these tools give the core for the upcoming GENESIS 3 GUI. - GShell: a simple replacement for the Genesis 2 SLI. - Heccer: a fast compartmental solver, a backend. - Dash: a second compartmental solver faster than Heccer, for simpler models. - Neurospaces Model Container: provides a solver independent internal and external storage format for models.

- Discrete event system: consists of a discrete event distributor and queuer. This is used for abstract modeling of an action potential traveling inside an axon as a "discrete event". - SSP: a flexible scheduler written in perl, to run simulations with the Neurospaces model container and Heccer. - The Neurospaces Studio: some tools for graphical browsing and command line usage. - The Genesis Script Language Interface: a scripting component that reads Genesis 2 scripts and feeds them to the Neurospaces model container. - The Geometry Library is a general purpose geometry library, with some essential geometrical operators, not commonly found in other geometrical libraries. - Using the Geometry Library, a Reconstruct Interface has been written. This interface supports the conversion of contours exported by the Reconstruct software to the Neurospaces declarative NDF format. - The Neurospaces project browser for browsing projects and inspecting simulation results. - The Installer package contains the Neurospaces installer and developer tools that have emerged from developing Neurospaces software components. - The Configurator package contains configuration utilities for the other tools. It is not needed for the other tools to work properly. Rather, it allows to set up model database and simulation servers in a convenient way. - There is also a Neurospaces blog and a wiki at googlecode for the Neurospaces project, with information for developers.

Synonyms: GENESIS Neurospaces

Resource Type: data or information resource, portal, simulation software, software application, software resource, topical portal

Keywords: action potential, biologically, cell, computational, development, interface, mathematical, memory, model, modeling, neural, neuron, neuronal, neuroscience, physics, scripting, simulation, simulator, software, database

Resource Name: GEneral NEural Simulation System: The Neurospaces Project

Resource ID: SCR_008035

Alternate IDs: nif-0000-10233

Record Creation Time: 20220129T080245+0000

Record Last Update: 20260905T133002+0000

Ratings and Alerts

No rating or validation information has been found for GEneral NEural Simulation System: The Neurospaces Project.

No alerts have been found for GEneral NEural Simulation System: The Neurospaces Project.

Data and Source Information

Source: [SciCrunch Registry](#)

Usage and Citation Metrics

We found 2 mentions in open access literature.

Listed below are recent publications. The full list is available at [PRECISE-TBI](#) .

Cornelis H, et al. (2012) Python as a federation tool for GENESIS 3.0. PloS one, 7(1), e29018.

Ray S, et al. (2008) PyMOOSE: Interoperable Scripting in Python for MOOSE. Frontiers in neuroinformatics, 2, 6.