Resource Summary Report

Generated by dkNET on May 20, 2025

Neurostruct

RRID:SCR_008861
Type: Tool

Proper Citation

Neurostruct (RRID:SCR_008861)

Resource Information

URL: http://www.neurostruct.org

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Description: THIS RESOURCE IS NO LONGER IN SERVICE, documented on July 16, 2013. A built-in toolbox for the tracing and analysis of neuroanatomy from nanoscale (high-resolution) imaging. It is a project under ongoing development. The name is originating by merging the words Neuron + reconstruct. The working concept is organized in filters applied successively on the image stack to be processed (pipeline). Currently, the focus of the software is the extraction of detailed neuroanatomical profiles from nanoscale imaging techniques, such as the Serial Block-Face Scanning Electron Microscopy (SBFSEM). The techniques applied, however, may be used to analyze data from various imaging methods and neuronal versatility. The underlying idea of Neurostruct is the use of slim interfaces/filters allowing an efficient use of new libraries and data streaming. The image processing follows in voxel pipelines by using the CUDA programming model and all filters are programmed in a datasize-independent fashion. Thus Neurostruct exploits efficiency and datasize-independence in an optimal way. Neurostruct is based on the following main principles: * Image processing in voxel pipelines using the general purpose graphics processing units (GPGPU) programming model. * Efficient implementation of these interfaces. Programming model and image streaming that guarantees a minimal performance penalty. * Datasize-independent programming model enabling independence from the processed image stack. * Management of the filters and IO data through shell scripts. The executables (filters) are currently managed through shell scripts. The application focuses currently in the tracing of single-biocytin filled cells using SBFSEM imaging. : * Extraction of neuroanatomical profiles: 3D reconstrution and 1D skeletons of the imaged neuronal structure. * Complete tracing: Recognition of the full neuronal structure using envelope techniques, thereby remedying the problem of spines with thin necks of an internal diameter approaching the SBFSEM resolution. * Separation (Coloring) of subcellular structures: Algorithms for the separation of spines from their root dendritic stem. * Evaluation

and analysis of the imaged neuroanatomy: Calculation of the dendritic and spine membrane''s surface, spine density and variation, models of dendrites and spines

Abbreviations: Neurostruct

Synonyms: Neurostruct - Project: Image and object processing filters for the tracing and analysis of neuroanatomy, Neurostruct-Project, Neurostruct - Project

Resource Type: software application, data processing software, segmentation software, image analysis software, software resource

Defining Citation: PMID:21424815

Keywords: neuroanatomy, imaging, analysis, tracing, electron microscopy, neuron, image processing, image reconstruction, serial block face scanning electron microscopic imaging assay

Funding:

Availability: THIS RESOURCE IS NO LONGER IN SERVICE

Resource Name: Neurostruct

Resource ID: SCR_008861

Alternate IDs: nlx_149368

Record Creation Time: 20220129T080249+0000

Record Last Update: 20250519T203553+0000

Ratings and Alerts

No rating or validation information has been found for Neurostruct.

No alerts have been found for Neurostruct.

Data and Source Information

Source: SciCrunch Registry

Usage and Citation Metrics

We found 1 mentions in open access literature.

Listed below are recent publications. The full list is available at dkNET.

Lang S, et al. (2011) Fast extraction of neuron morphologies from large-scale SBFSEM

image stacks. Journal of computational neuroscience, 31(3), 533.