

Nutil

A PRE- AND POST- PROCESSING TOOLBOX FOR HISTOLOGICAL RODENT BRAIN SECTION IMAGES

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NUTIL IS A KEY COMPONENT OF THE QUINT WORKFLOW FOR QUANTIFICATION AND SPATIAL ANALYSIS OF LABELLED FEATURES IN HISTOLOGICAL RODENT BRAIN SECTION IMAGES

▶▶ TECHNOLOGY DESCRIPTION

Nutil is a pre- and post- processing toolbox for analysis of large collections of histological images of rodent brain sections. The software is open access with a simple graphical user interface for specifying the input and output parameters. Nutil includes a transformation tool for automated scaling, rotation, mirroring and renaming of image files; a file format convertor; a simple resize tool; and a post-processing method for quantifying and localizing labelled features based on a reference atlas of the brain (mouse or rat). The quantification method requires input from customised brain atlas maps generated with the QuickNII or VisuAlign software and segmentations generated with ilastik or another image analysis tool. It generates reports, point cloud coordinate files, and atlas map images superimposed with colour-coded objects.



NUTIL ENABLES COMPARATIVE STUDIES OF WHOLE RODENT BRAINS IN THE QUINT WORKFLOW



ALLOWS ATLAS BASED QUANTIFICATION OF CELLS, PROTEINS, RECEPTORS, FROM BIOIMAGING EXPERIMENTS IN MICE AND RATS

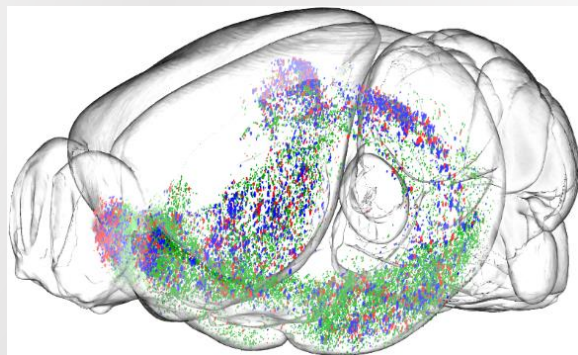
AREAS

Image Analysis | 3D Brain Atlases | Quantification

COMPETITIVE ADVANTAGES

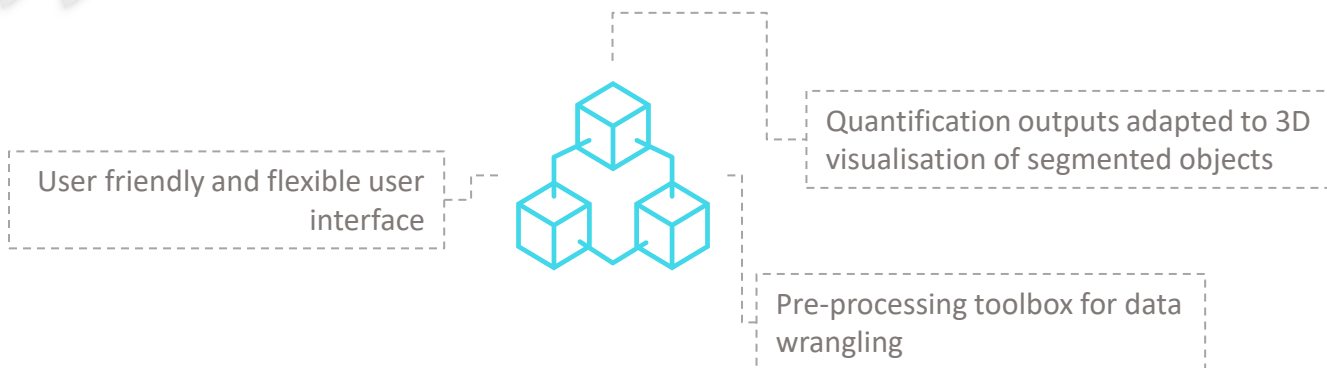
Nutil is compatible with the Allen Mouse Brain Atlas (CCFv3, 2015 and 2017) and the Waxholm Atlas of the Sprague Dawley rat (v2 and v3) whereas the commercial software NeuroInfo (MBF) is available for Allen Mouse brain atlas only.

New atlas templates can be implemented in our tools in the future.



NUTIL QUANTIFICATION TOOL ENABLES COUNTS AND LOAD CALCULATION OF SEGMENTED OBJECTS

APPLICATION & MARKET POTENTIAL



REFERENCES

- <https://ebrains.eu/service/quint>

Nutil is tailored specifically for the needs of biological researchers (500- 1000 estimated in Europe) working with histological rodent brain section images.

Nutil is being used in the large cohort study BRAINSPACE by the Kaczorowski Lab (Jackson Laboratory, Bar Harbor) and DOPAMAP by the Jee Hyun Kim lab (Molecular Psychiatry Laboratory, Deakin University),

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TECHNOLOGY READINESS LEVEL

