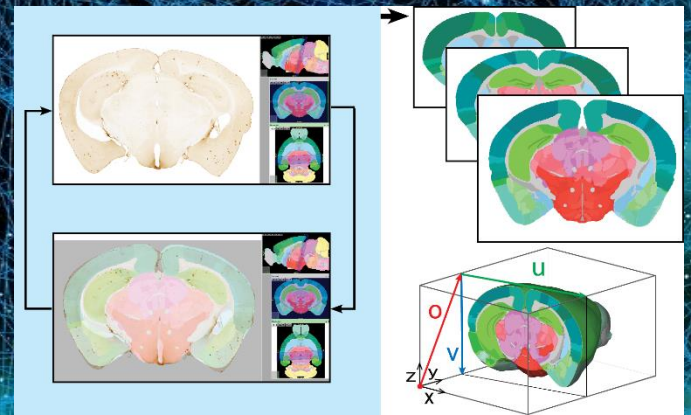


QuickNII and VisuAlign

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Rapid and efficient rodent brain image registration to a volumetric reference atlas

TECHNOLOGY DESCRIPTION

QuickNII is a stand-alone tool for user guided affine spatial registration (anchoring) of sectional image data to a 3D reference atlas space. The reference atlas is transformed to match anatomical landmarks in the corresponding experimental images without introducing transformations in these original images. Following anchoring of a limited number of sections containing key landmarks, transformations are propagated across the entire series of images to reduce the amount of manual steps required.

Further precision in registration can be achieved with the *VisuAlign* software performing a non-linear registration of the *QuickNII* output.

Landmark based registration of mouse and rat 2D brain images to 3D reference atlases.

Capability to generate user defined cut planes matching the orientation of the 2D experimental image data.

Output of image coordinates in 3D space enabling atlas-based analyses of objects of interest.

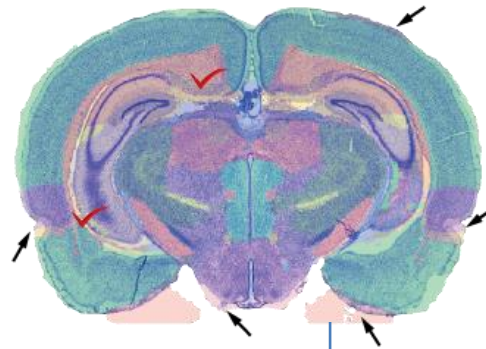
AREAS

Image Analysis | 3D Brain Atlases | Spatial integration

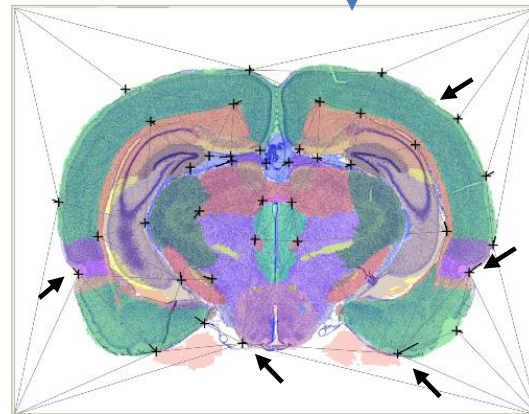


COMPETITIVE ADVANTAGES

- QuickNII allows affine (linear) registration and integration of many rodent 2D dataset in a reliable and robust way
- QuickNII is a key tool in the QUINT analysis workflow allowing whole brain analysis of big animal cohorts
- VisuAlign allows further precision (non-linear registration) to be added to the QuickNII output
- QuickNII and VisuAlign are compatible with the Allen Mouse Brain Atlas (CCFv3, 2015 and 2017) and the Waxholm Atlas of the Sprague Dawley rat (v2 and v3) whereas commercial software NeuroInfo (MBF) is available for Allen Mouse brain atlas only



QuickNII output



VisuAlign output

QuickNII linear registration is further refined with the VisuAlign non-linear tool

APPLICATION & MARKET POTENTIAL

- User friendly and robust image registration applications are highly demanded by the Neuroscience community.
- QuickNII and VisuAlign are developed and used in the context of the EU Human Brain Project.
- Users also include the Korea Brain Institute and the Kaczorowski Lab at The Jackson Laboratory (Bar Harbor).
- QuickNII is included in the BRAIN Initiative Cell Census Network (BICCN) Tools and Analysis list

TECHNOLOGY READINESS LEVEL



REFERENCES

Puchades MA et al. (2019) Spatial registration of serial microscopic brain images to three-dimensional reference atlases with the QuickNII tool. PlosOne. 14(5): e0216796. doi: 10.1371/journal.pone.0216796

<https://www.nitrc.org/projects/quicknii>

<https://www.nitrc.org/projects/visualign/>

Number of QuickNII downloads Dec 2018 – March 2020: 1600

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