Supplementary material

This page contains supplementary material for the article:

Common Atlas Format and 3D Brain Atlas Reconstructor: Infrastructure for Constructing 3D Brain Atlases

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One of the challenges of modern neuroscience is integrating voluminous data of diferent modalities derived from a variety of specimens. This task requires a common spatial framework that can be provided by brain atlases. The first atlases were limited to two-dimentional presentation of structural data. Recently, attempts at creating 3D atlases have been made to offer navigation within non-standard anatomical planes and improve capability of localization of different types of data within the brain volume.

The 3D atlases available so far have been created using frameworks which make it difficult for other researchers to replicate the results. To facilitate reproducible research and data sharing in the field we propose an SVG-based Common Atlas Format (CAF) to store 2D atlas delineations or other compatible data and 3D Brain Atlas Reconstructor (3dBAR), software dedicated to automated reconstruction of three-dimensional brain structures from 2D atlas data. The basic functionality is provided by 1) a set of parsers which translate various atlases from a number of formats into the CAF, and 2) a module generating 3D models from CAF datasets.

The whole reconstruction process is reproducible and can easily be configured, tracked and reviewed, which facilitates fixing errors. Manual corrections can be made when automatic reconstruction is not sufficient. The software was designed to simplify interoperability with other neuroinformatics tools by using open file formats. The content can easily be exchanged at any stage of data processing. The framework allows for the addition of new public or proprietary content.

Following supplementary materials are available:

1. Description of the graphical user interface
2. Command-line interface manual
3. Description of vector data processing - typical problems and their solutions.
4. Detailed description of the gap-filling algorithm
5. Creation of new structures.