3d Brain Atlas Reconstructor

Software dedicated for automatic generation of models of 3D brain structures.

Project goals

1. Creating software dedicated to automated reconstruction of 3D brain models. Key features:
    - ♦ Generating model of any combination of structures (ie. basing on structures hierarchy),
    - ♦ Arbitrary resolution of generated model (depends on source atlas quality only),
    - ♦ Exporting models in VRML format as polygonal mesh or volumetric data.
    - ♦ Modularity: One 3D model generation module, many wrappers for different input atlases.

2. Support the software with:
    - ♦ Own data (ultimate goal),
    - ♦ Existing 2D atlases (as training sets).

3. Creating special dataset format
    - ♦ Based on SVG format,
    - ♦ Adapted for handling representation of brain structures,
    - ♦ Supporting brain regions hierarchy,
    - ♦ Maximizing possibilities of atlasing systems interoperability.

4. Ultimately, 3D Brain Atlas Reconstructor would be available as an open source project and on-line service with API.

3d Brain Atlas Reconstructor workflow

Application screenshots

Ontology tree (left) allows browsing for structures, select structures for reconstruction or load already reconstructed models. Structure selection tab (right) Displays detailed information about currently reconstructed structure as well as provide reconstruction properties. On the left side there is a list of available structures (narrowed to structures containing "CA"). On the right structures selected for reconstruction are presented.

Model customization tab Reconstructed structures may be previewed before exporting. Furthermore, additional model modifications (smoothing, mesh complexity reduction, etc.) may be applied.