Using atlas data as a spatial reference for a result of a realistic neural network simulation

Model download

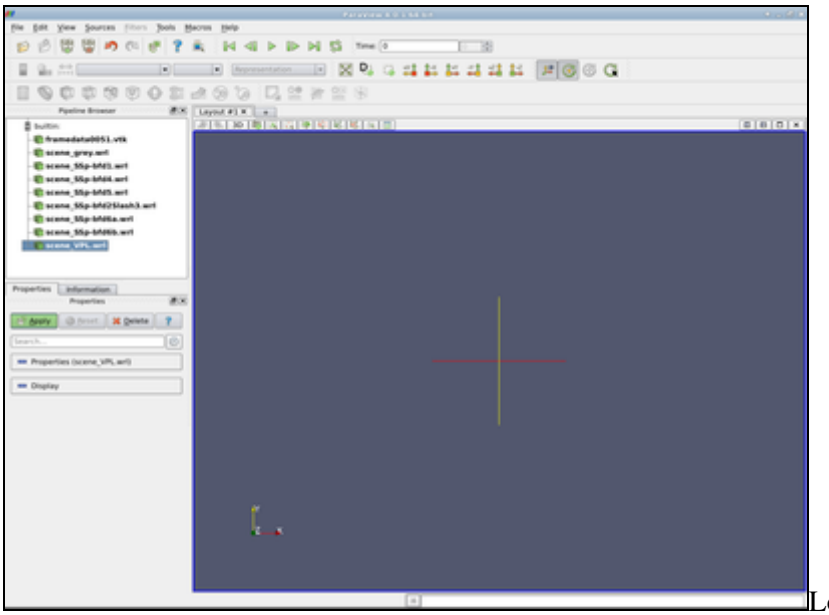
From The Allen Mouse Brain Reference Atlas, 2011 Segmentation download the following VRML high quality models:

- Basic cell groups and regions,
- Primary somatosensory area, barrel field, layer 1,
- Primary somatosensory area, barrel field, layer 2/3,
- Primary somatosensory area, barrel field, layer 4,
- Primary somatosensory area, barrel field, layer 5,
- Primary somatosensory area, barrel field, layer 6a,
- Primary somatosensory area, barrel field, layer 6b,
- Ventral posterolateral nucleus of the thalamus.

Download also a model of a of the barrel cortex column. Unwrap downloaded archives.

Visualisation

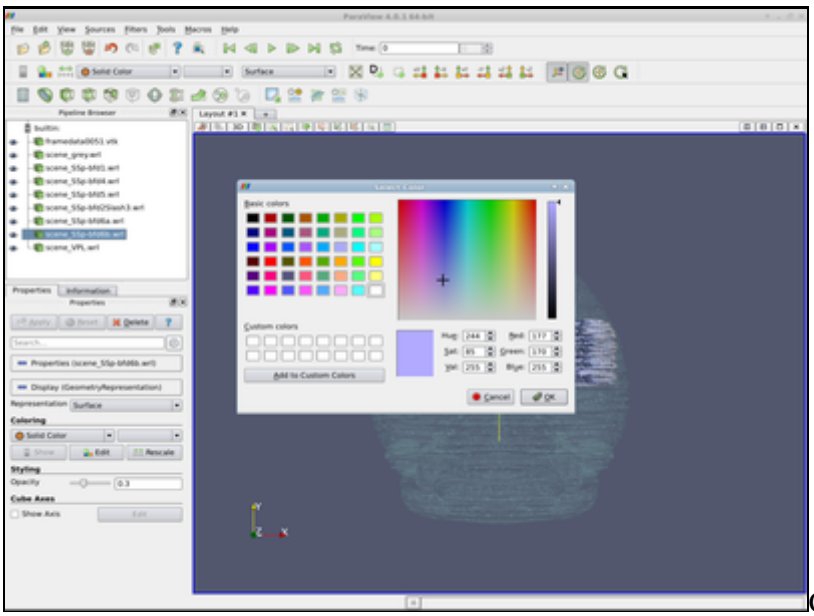
Run ParaView software (description for version 4.0.1). Open downloaded *.wrl and *.vtk files. Click the *Apply* button (in the tab *Properties*).


Loaded models.

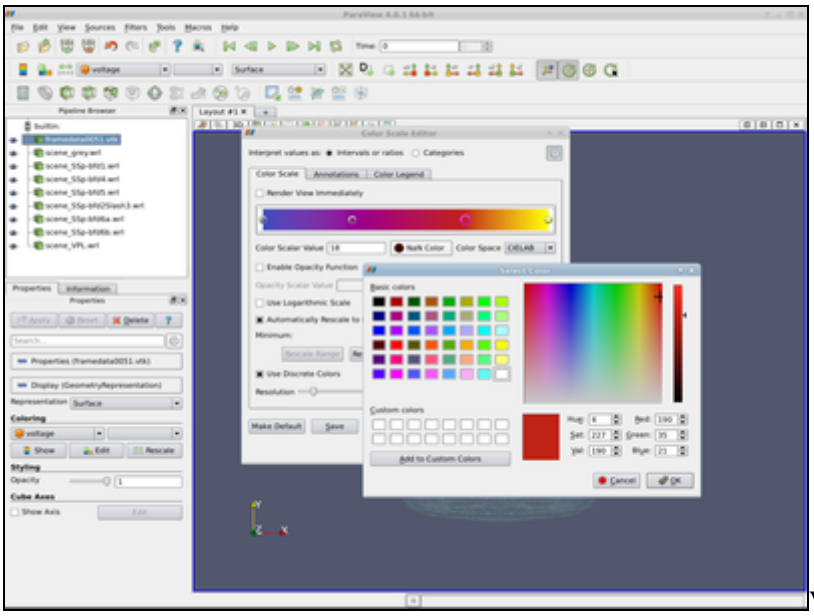
In the *Properties* tab set *Styling: Opacity* to 0.1 for *scene_grey.wrl* model. For every *scene_SSp_bfd*.wrl* model set *Styling: Opacity* to 0.3, then change *Coloring* from *VRMLColor* to *Solid Color*. Click *Coloring: Edit* and select color to:

- Red = 250, Green: 245, Blue: 255 for *scene_SSp_bfd1.wrl*,

- Red = 153, Green: 163, Blue: 255 for *scene_SSp_bfd2Slash3.wrl*,
- Red = 74, Green: 77, Blue: 128 for *scene_SSp_bfd4.wrl*,
- Red = 171, Green: 177, Blue: 255 for *scene_SSp_bfd5.wrl*,
- Red = 145, Green: 149, Blue: 213 for *scene_SSp_bfd6a.wrl*,
- Red = 177, Green: 170, Blue: 255 for *scene_SSp_bfd6b.wrl*.


Color and opacity settings.

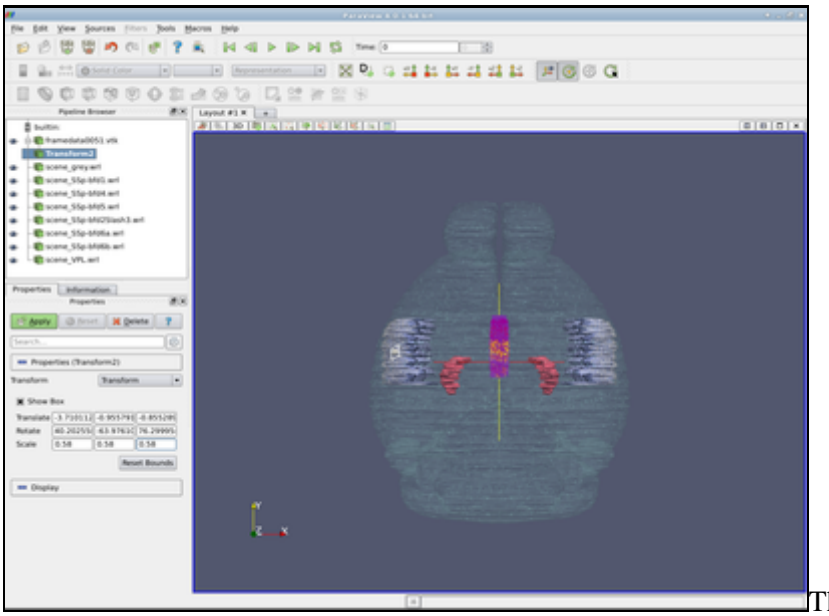
Click *Coloring: Edit* for the *framedata0051.vtk* model (ensure that *Coloring* is set to *voltage*). Click the "Gear" icon to edit *Color Scale*. Set *Color Space* to *CIELAB*; set the left color point to Red = 59, Green = 76 and Blue = 192 and the right to Red = 255, Green = 255 and Blue = 0. Add two color points: at *Color Scalar Value* = -40 (Red = 150, Green = 150 and Blue = 0) and at *Color Scalar Value* = 18 (Red = 190, Green = 35 and Blue = 21). Click the *Apply* button, then close the *Color Scale Editor* window.


Voltage to color mapping.

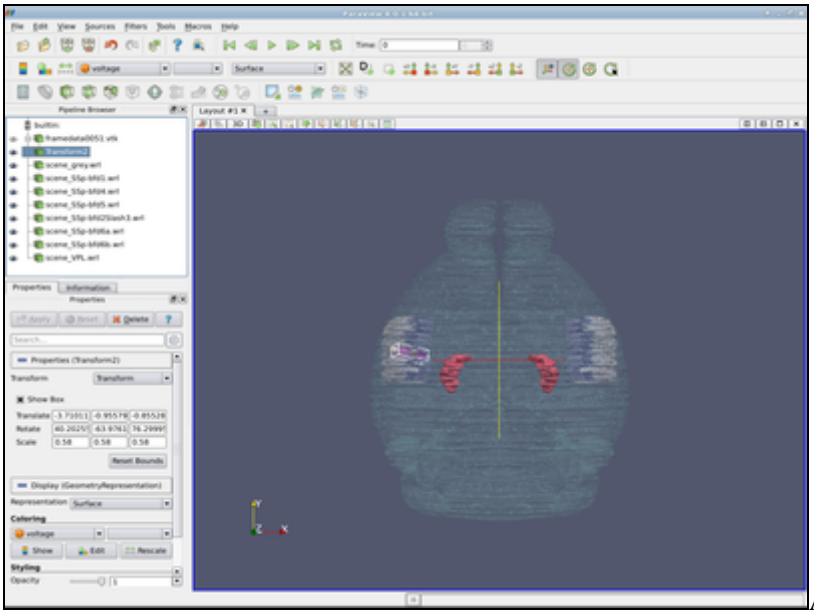
Apply the *Transform* filter (*Filters/Alphabetical/Transform* from menu) to the *framedata0051.vtk* model. In the

Properties tab set the transformation matrix to:

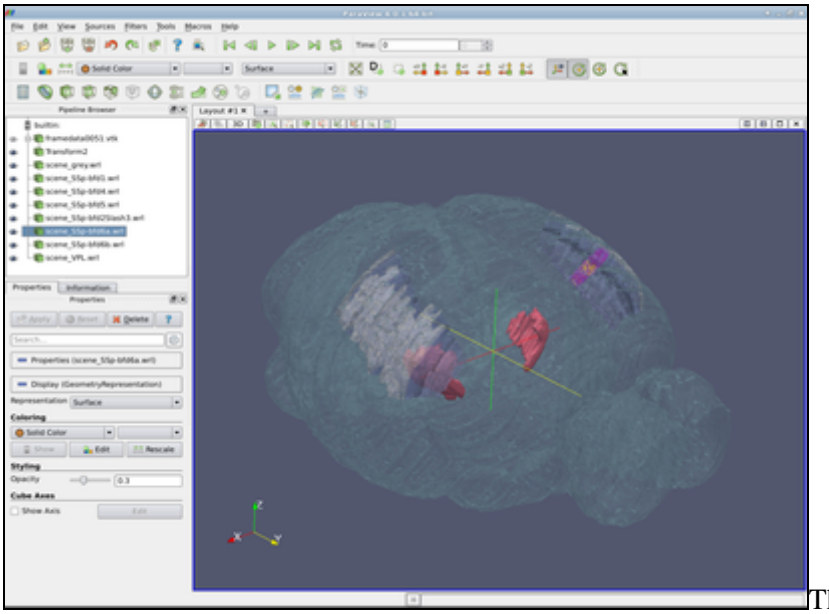
Translate	-3.71011222757522	-0.955791920040867	-0.855289018330382
Rotate	40.2025580192141	-63.976105129058	76.2999549515704
Scale	0.58	0.58	0.58

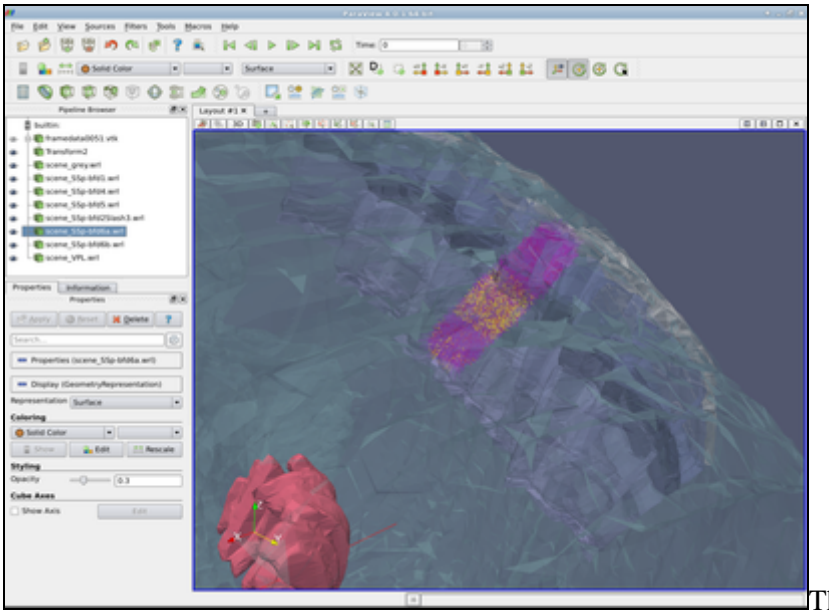

The transformation filter.

Click the *Apply* button.


A complete scene.

Choose an appropriate viewport and export the scene or a screenshot if you wish.


The complete scene at another viewpoint.


The complete scene - focus on the model of barrel cortex column.