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

Model download

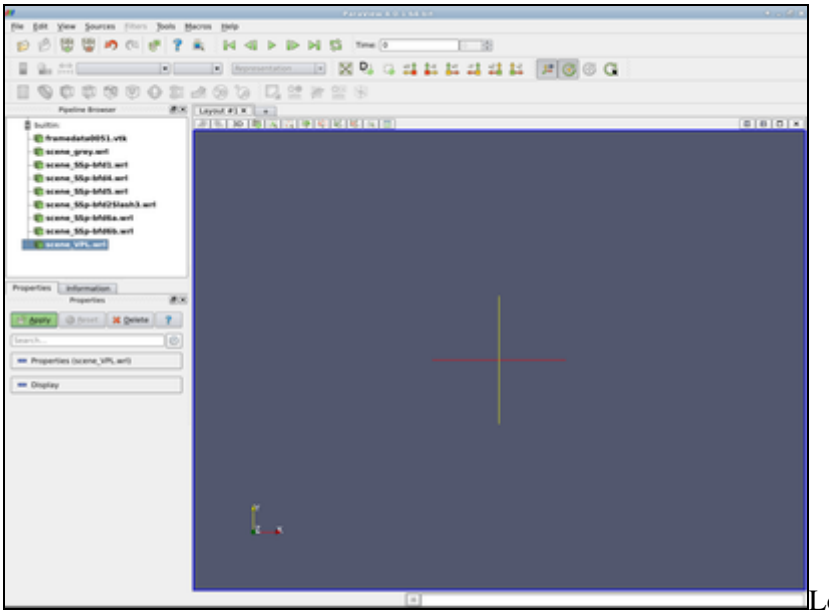
From http://www.3dbar.org:8080/getPreview?cafDatasetName=aba2011;structureName=grey,VPL,SSp-bfd1,SSp-bfd2Slash3,SSp- The Allen Mouse Brain Reference Atlas, 2011 Segmentation download the following VRLM high quality models:

- http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=grey&qualityPreset=high Basic cell groups and regions,
- http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=VPL&qualityPreset=high Ventral posterolateral nucleus of the thalamus,
- http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd1&qualityPreset= Primary somatosensory area, barrel field, layer 1,
- http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd2Slash3&quality Primary somatosensory area, barrel field, layer 2/3,
- http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd4&qualityPreset= Primary somatosensory area, barrel field, layer 4,
- http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd5&qualityPreset= Primary somatosensory area, barrel field, layer 5,
- http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd6a&qualityPreset Primary somatosensory area, barrel field, layer 6a,
- http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd6b&qualityPreset Primary somatosensory area, barrel field, layer 6b.

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

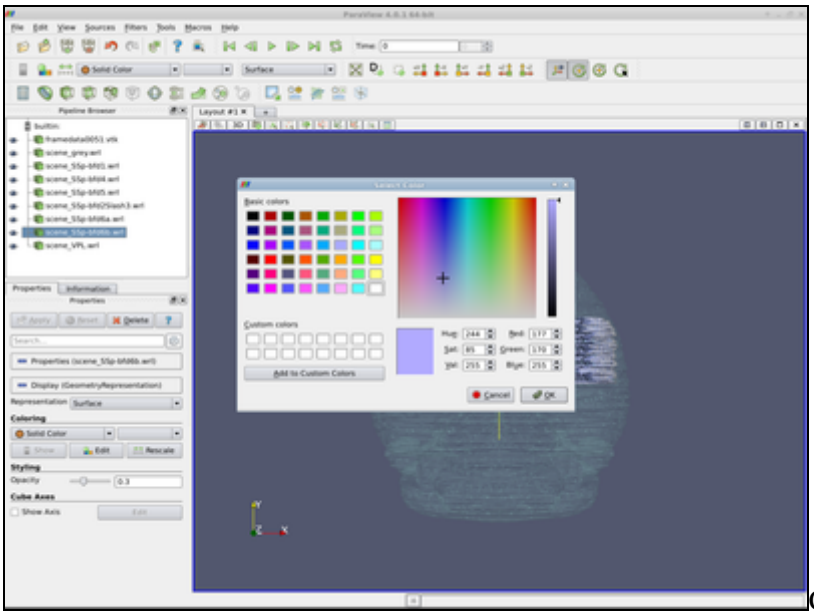
Visualisation

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


Loaded models.

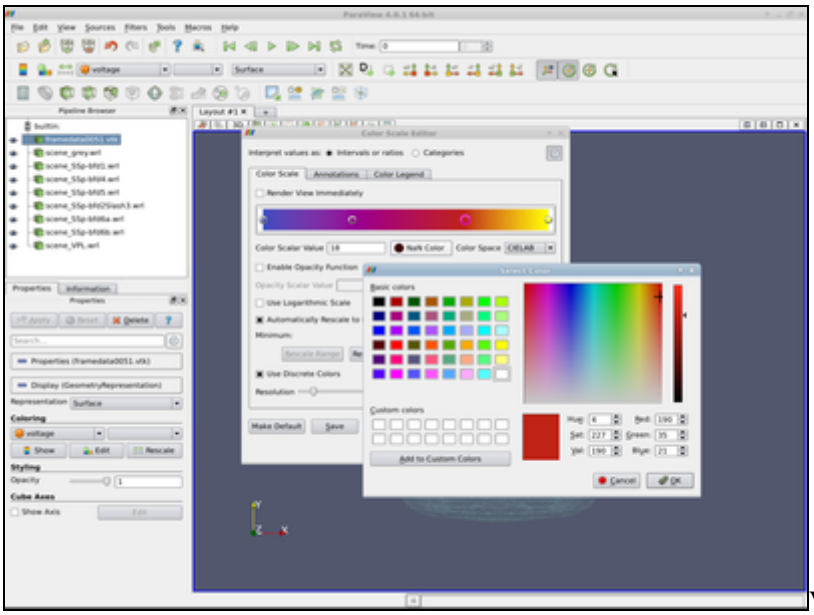
In the *Properties* tab set *Styling: Opacity* to 0.1 for *scene_grey.wrl* model. For every *scene_SSp_bfd*.wrl* model set *Styling: Opacity* to 0.3, then change *Coloring* from *VRMLColor* to *Solid Color*. Click *Coloring: Edit* and select color to:

- 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.

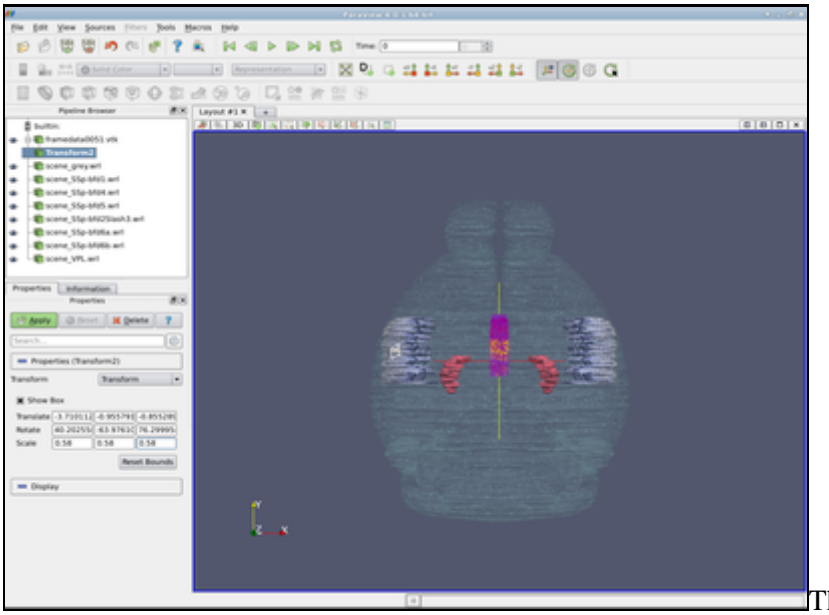
Click *Coloring: Edit* for the *framedata0051.vtk* model (ensure that *Coloring* is set to *voltage*). Click the "Gear" icon to edit *Color Scale*. Set *Color Space* to *CIELAB*; set the left color point to Red = 59, Green = 76 and Blue = 192

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.

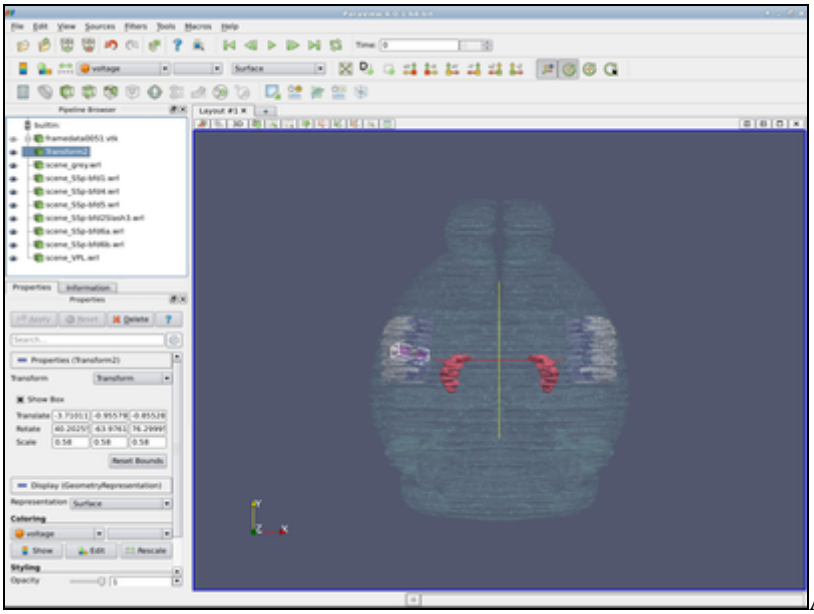

Voltage to color mapping.

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	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.

- 1 - Open Grayscale Image... - Tutorial: How to use labeled volumes?
- 2 - Choose NIfTI volume you extracted - Tutorial: How to use labeled volumes?
- 4 - Choose 'Segmentation', then 'Load from image' - Tutorial: How to use labeled volumes?
- 5 - Select the same NIfTI file - Tutorial: How to use labeled volumes?
- 7 - "Segmentation", "Load Label Descriptions..." - Tutorial: How to use labeled volumes?
- 8 - Select file with the lookup table - Tutorial: How to use labeled volumes?
- 9 - - Tutorial: How to use labeled volumes?
- 10 - Click 'update mesh' button - Tutorial: How to use labeled volumes?
- 11 - "Segmentation", "Export As Surface Mesh" - Tutorial: How to use labeled volumes?
- 12 - - Tutorial: How to use labeled volumes?
- 13 - Downloading labeled volume from 'Atlas Details' tab - Tutorial: How to use labeled volumes?
- 14 - Downloading labeled volume from 'Live preview' tab - Tutorial: How to use labeled volumes?
- 15 - You have to be logged in in order to access the *Custom Reconstruction Wizzard. Structures loaded in* Live preview *window are automatically transferred to the reconstruction wizard. - Accessing the Custom Reconstruction Wizzard*
- 16 - Accessing the reconstruction wizzard from the *Reconstructions* tab. - Accessing the Custom Reconstruction Wizzard
- 17 - Visualisation01 - Loaded models.
- 18 - Visualisation02 - Color and opacity settings.
- 19 - Visualisation03 - Voltage to color mapping.
- 20 - Visualisation04 - The transformation filter.
- 21 - Visualisation05.png - A complete scene.
- 22 - Visualisation06.png - The complete scene at another viewpoint.
- 23 - Visualisation07.png - The complete scene - focus on the model of barrel cortex column.