

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

## Model download

From

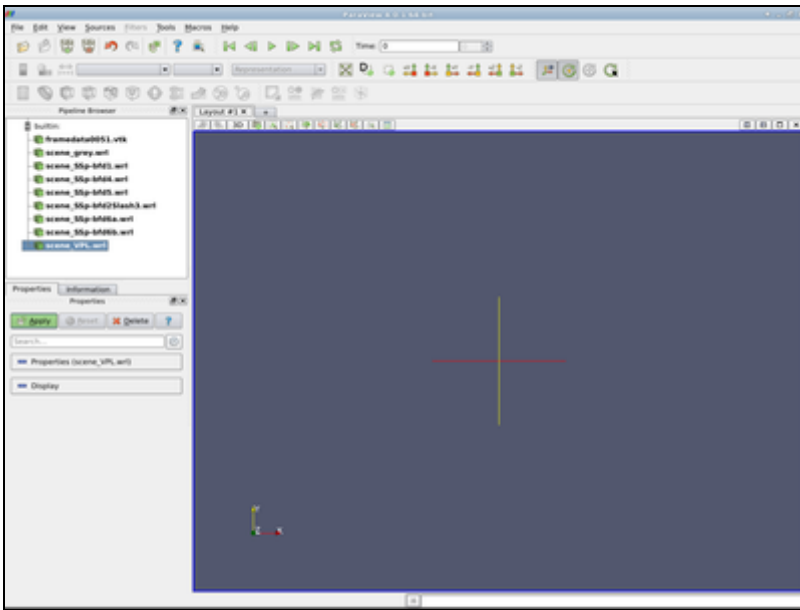
<http://www.3dbar.org:8080/getPreview?cafDatasetName=aba2011;structureName=grey,VPL,SSp-bfd1,SSp-bfd2Slash3,SSp-bfd3,SSp-bfd4,SSp-bfd5,SSp-bfd6a,SSp-bfd6b>  
The Allen Mouse Brain Reference Atlas, 2011 Segmentation download the following VRLM high quality models:

- <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=high>  
Primary somatosensory area, barrel field, layer 1,
- <http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd2Slash3&qualityPreset=high>  
Primary somatosensory area, barrel field, layer 2/3,
- <http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd4&qualityPreset=high>  
Primary somatosensory area, barrel field, layer 4,
- <http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd5&qualityPreset=high>  
Primary somatosensory area, barrel field, layer 5,
- <http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd6a&qualityPreset=high>  
Primary somatosensory area, barrel field, layer 6a,
- <http://www.3dbar.org:8080/getReconstruction?cafDatasetName=aba2011&structureName=SSp-bfd6b&qualityPreset=high>  
Primary somatosensory area, barrel field, layer 6b.

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

## Visualisation

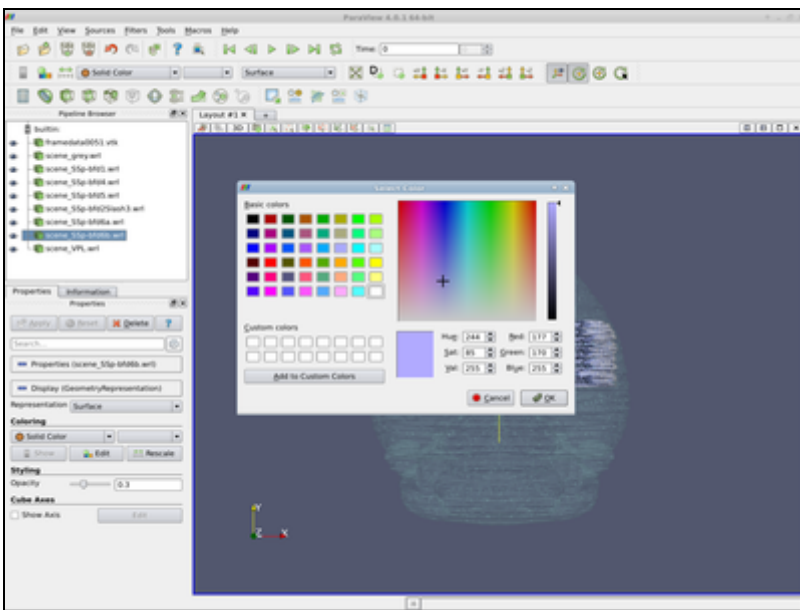
Run <http://www.paraview.org> ParaView software (description for version 4.0.1). Open downloaded \*.wrl and \*.vtk files. Click the *Apply* button (in the tab *Properties*).



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:

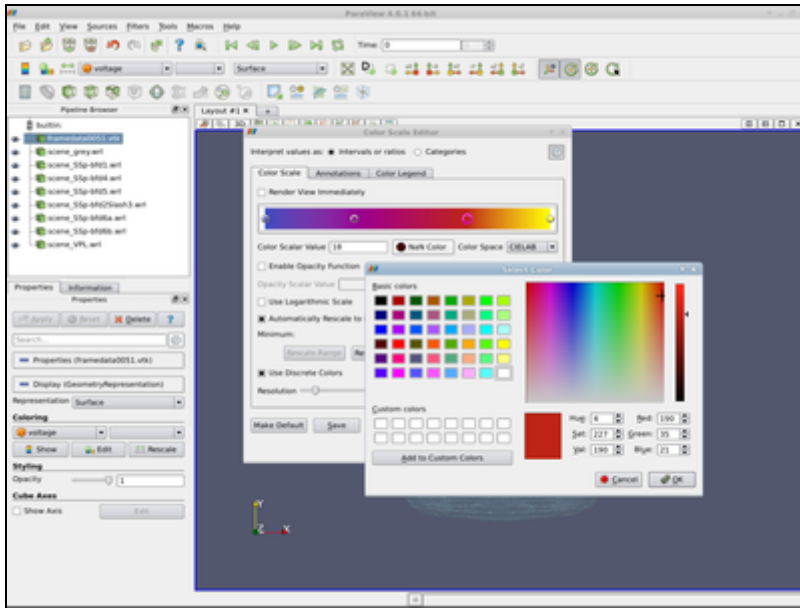
- Red = 250, Green: 245, Blue: 255 for *scene\_SSp\_bfd1.wrl*,
- Red = 153, Green: 163, Blue: 255 for *scene\_SSp\_bfd2Slash3.wrl*,
- Red = 74, Green: 77, Blue: 128 for *scene\_SSp\_bfd4.wrl*,
- Red = 171, Green: 177, Blue: 255 for *scene\_SSp\_bfd5.wrl*,
- Red = 145, Green: 149, Blue: 213 for *scene\_SSp\_bfd6a.wrl*,
- 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

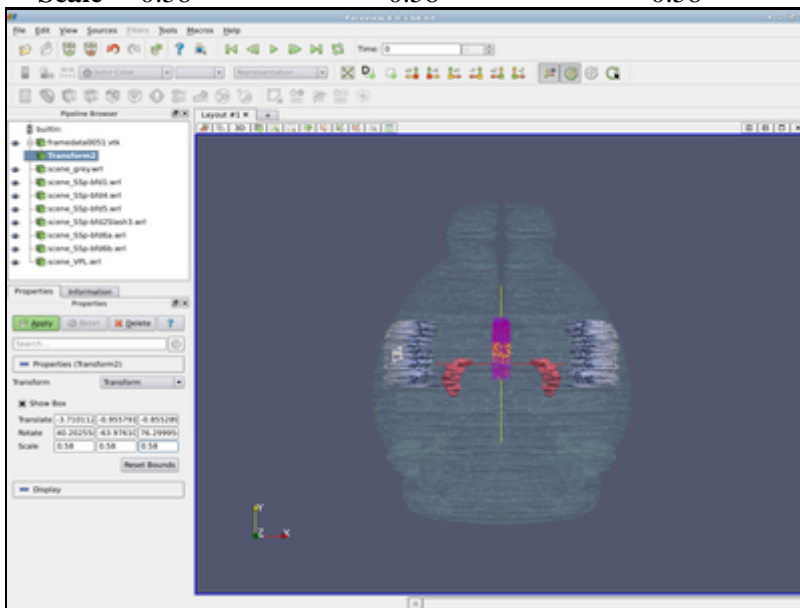
and the right to Red = 255, Green = 255 and Blue = 0. Add two color points: at *Color Scalar Value* = -40 (Red = 150, Green = 150 and Blue = 0) and at *Color Scalar Value* = 18 (Red = 190, Green = 35 and Blue = 21). Click the *Apply* button, then close the *Color Scale Editor* window.



Voltage to color mapping.

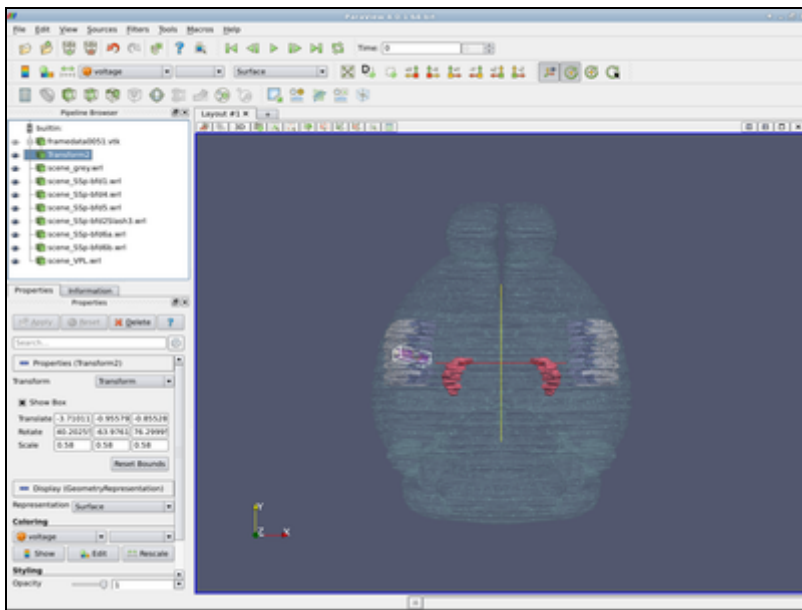
Apply the *Transform* filter (*Filters/Alphabetical/Transform* from menu) to the *framedata0051.vtk* model. In the *Properties* tab set the transformation matrix to:

**Translate** -3.71011222757522 -0.955791920040867 855289018330382  
**Rotate** 40.2025580192141 -63.976105129058 76.2999549515704  
**Scale** 0.58 0.58 0.58



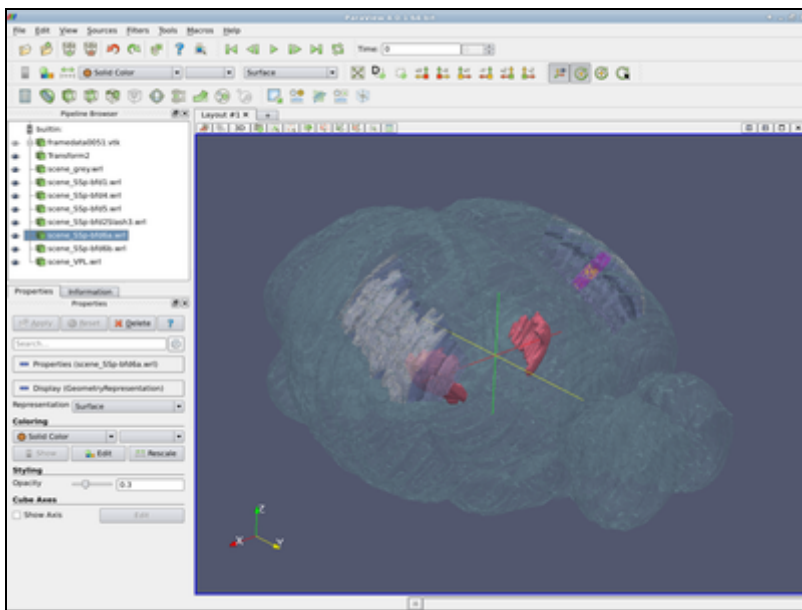
The transformation filter.

Click the *Apply* button.

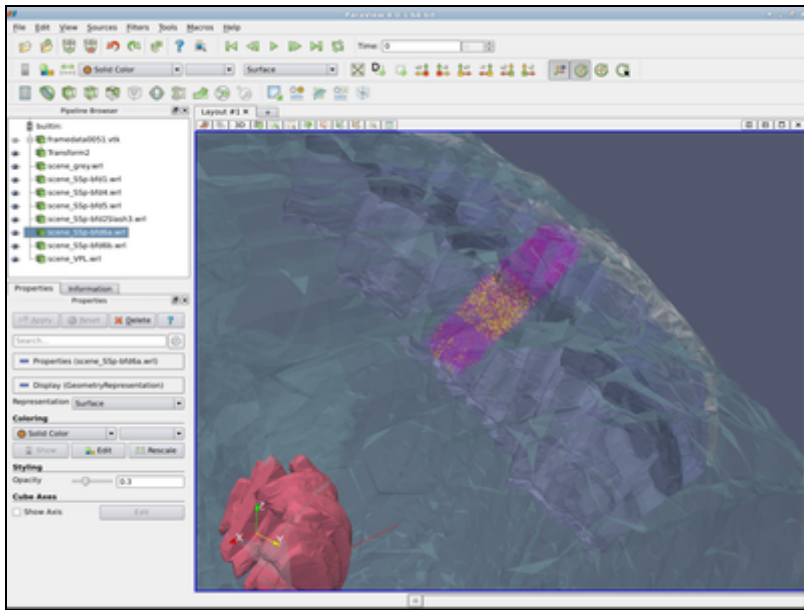


A complete scene.

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.