

3D Visualization of FreeSurfer Data

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Acknowledgements



National Alliance for Medical Image Computing NIH U54EB005149



NIH P41RR013218 Morphometry Biomedical Informatics Research Network

NIH U24RRO21382

Neuroimage Analysis Center



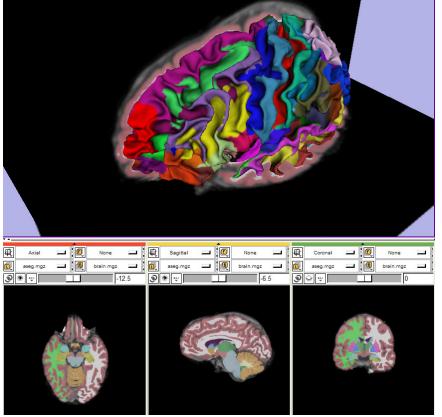
Surgical Planning Laboratory (BWH) Thanks to Nicole Aucoin



Center for Functional Neuroimaging Technology NIH P41RR14075



Learning Objective



Guide you step-by-step through the process of loading and viewing **FreeSurfer** segmentations, surface reconstructions, and parcellation results within **Slicer3.**





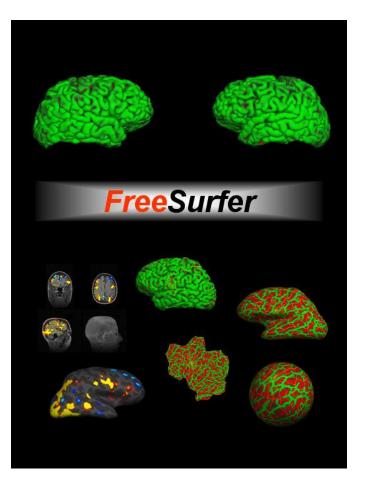
This tutorial assumes that you have completed the course **Slicer3Visualization Tutorial.**

Tutorials for **Slicer3.4** are available on the Slicer101 page:

http://www.slicer.org/slicerWiki/index.php/Slicer3.4:Training#Software_tutorials



Prerequisites



This tutorial assumes a working knowledge of how to use **FreeSurfer** to generate segmentation and surface files.

Tutorials for **FreeSurfer** are available at the following location:

http://surfer.nmr.mgh.harvard.edu/fswiki/Tutorials/



Materials

•This tutorial requires the installation of the **Slicer3.4** software and the tutorial dataset.

•Download and install the Slicer3.4 software from the Slicer web site

http://www.slicer.org/pages/Special:SlicerDownloads

Disclaimer: It is the responsibility of the user of Slicer to comply with both the terms of the license and with the applicable laws, regulations, and rules.



This tutorial makes use of the same T1 weighted image dataset (bert) that is used for the FreeSurfer tutorial available at the following location:

http://surfer.nmr.mgh.harvard.edu/fswiki/FsTutorial

If you already have the FreeSurfer subject 'bert' on your computer, then just download the file 'slicerGenericScene.mrml'

http://www.na-mic.org/Wiki/index.php/Image:SlicerGenericScene.mrml

If you don't have the FreeSurfer tutorial dataset known as 'bert' on your computer, then download the archive below:

http://www.na-mic.org/Wiki/index.php/Image:FreeSurferData.tar.gz





From FreeSurfer, Slicer3 can load:

• • All of the above, via a scene file.....

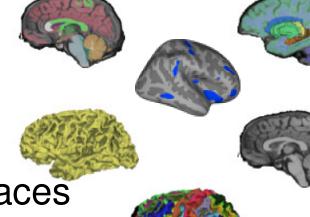




•Part 1: Loading and Visualizing FreeSurfer Volumes

•Part 2: Building 3D Models

 Part 3: Loading FreeSurfer Surfaces and Visualizing Parcellation Maps



•Part 4:Automatic Data Loading via a Generic Scene File

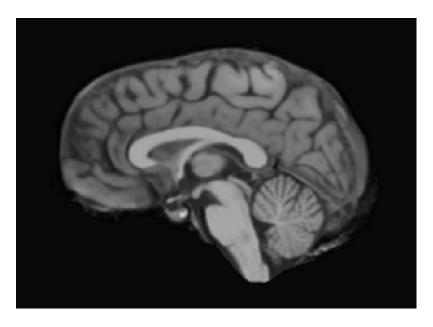


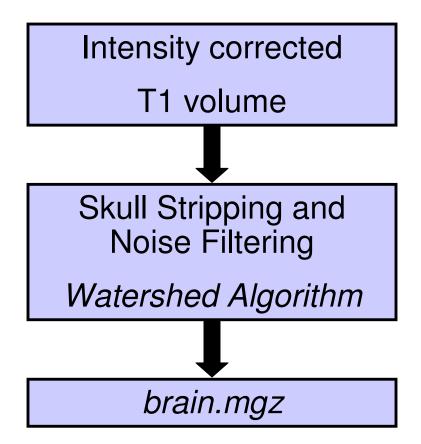
Part 1: Loading and Visualizing FreeSurfer Volumes



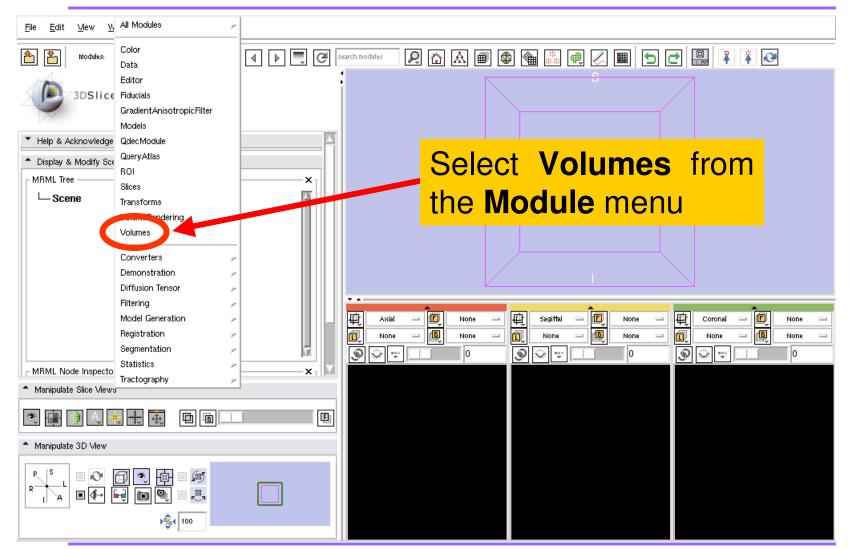


FreeSurfer pipeline













Loading a Brain File

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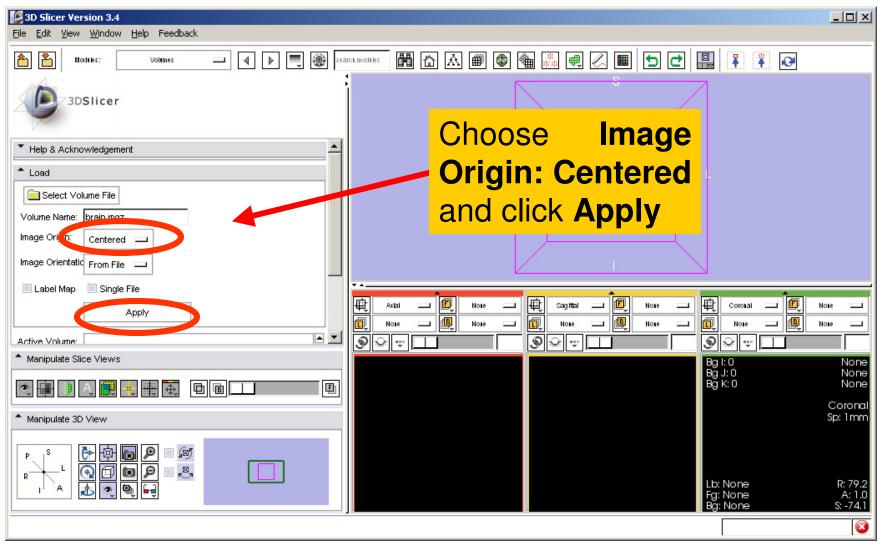
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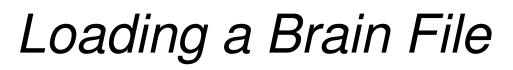


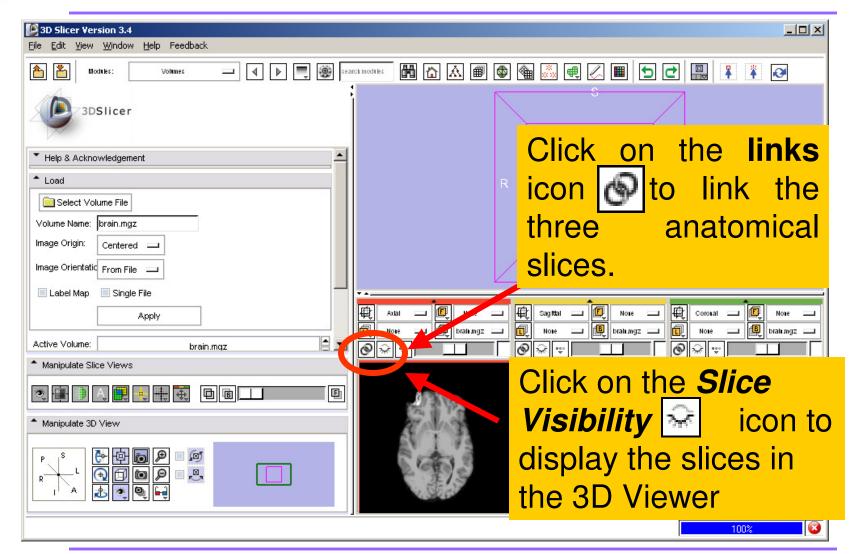




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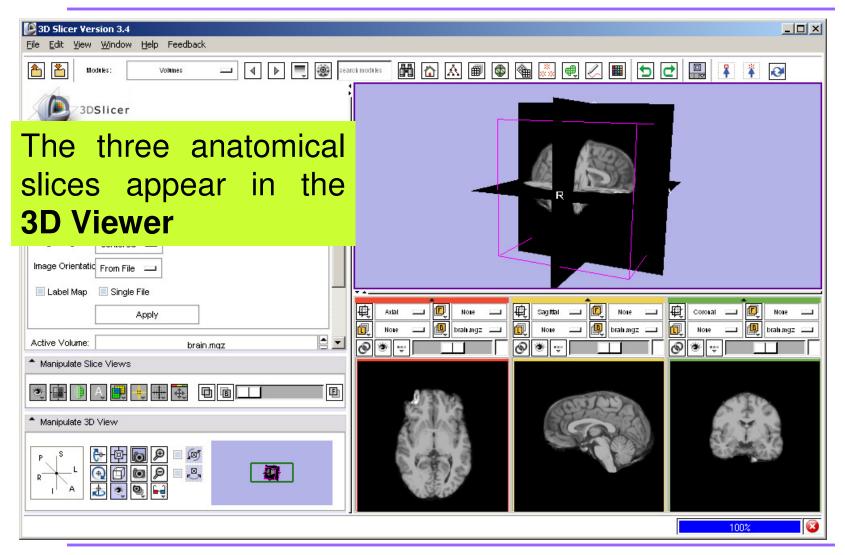
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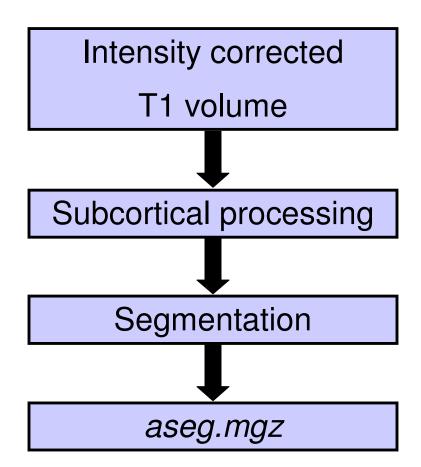




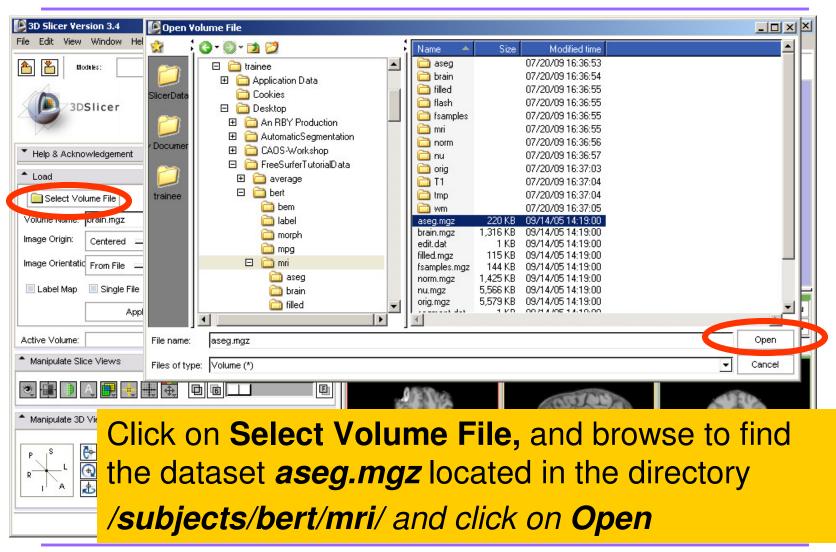


FreeSurfer pipeline



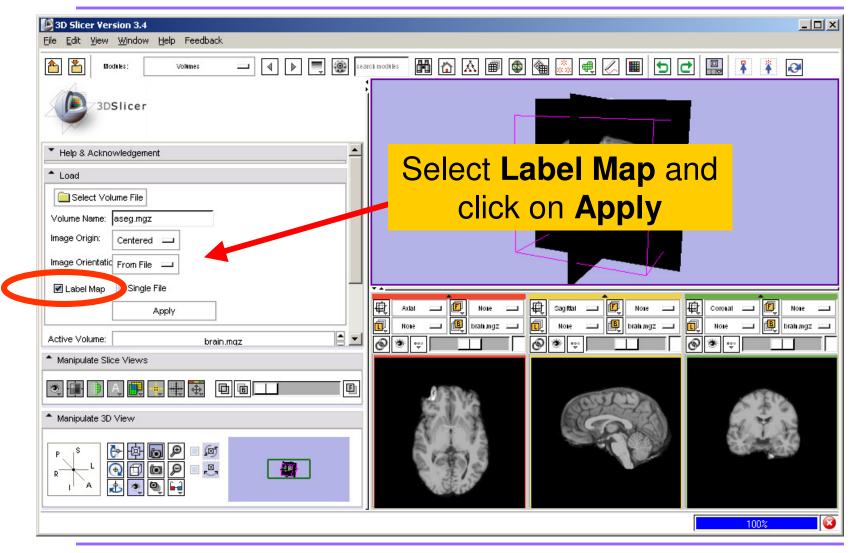






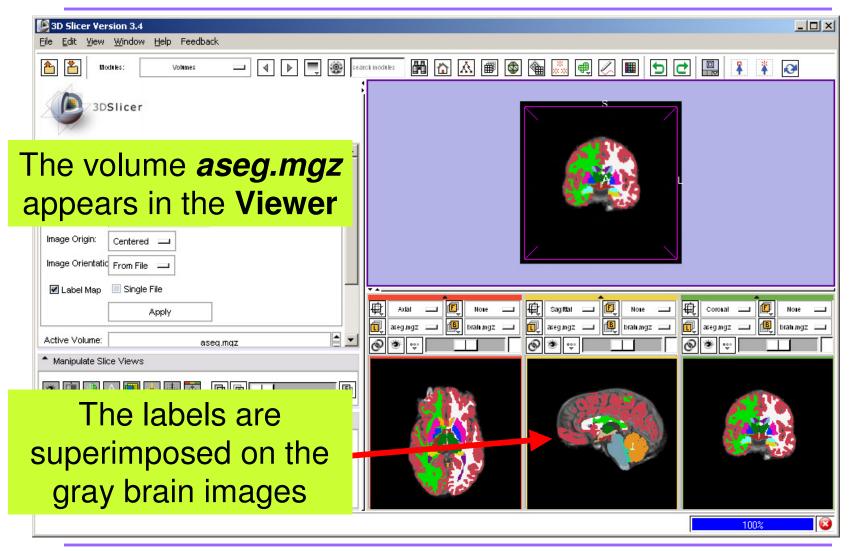
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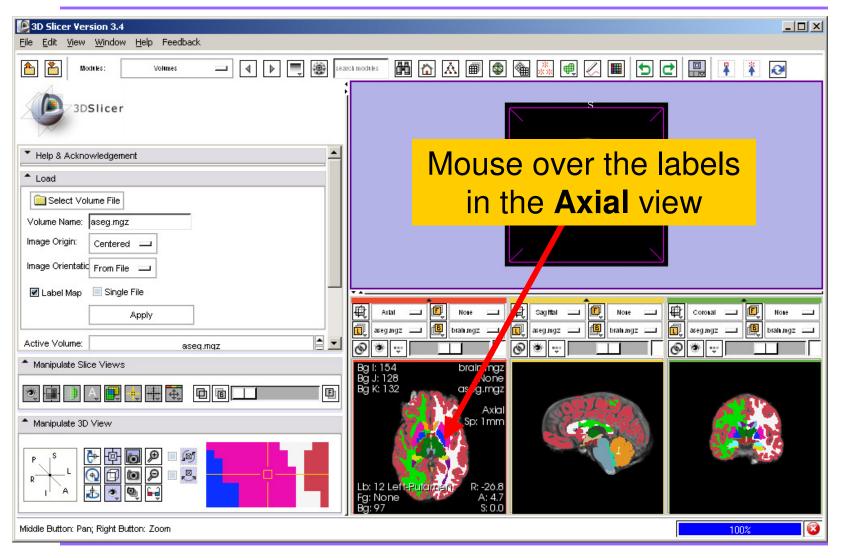
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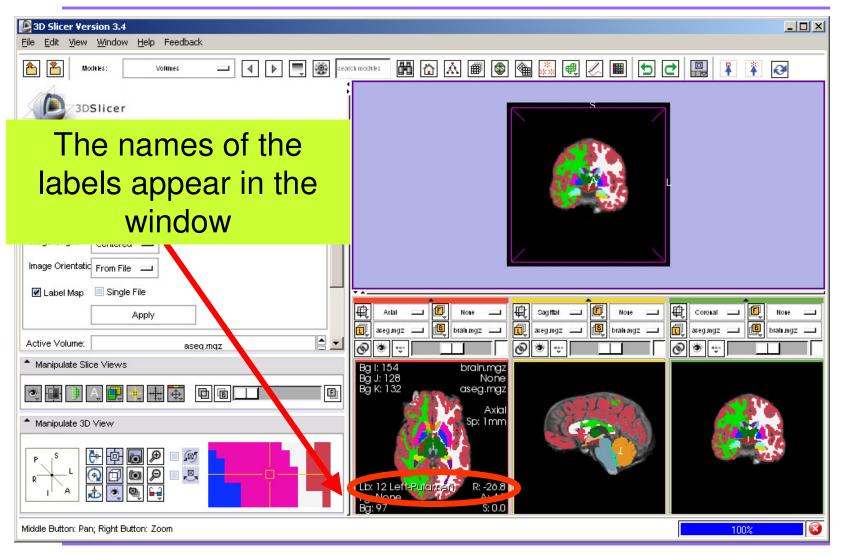
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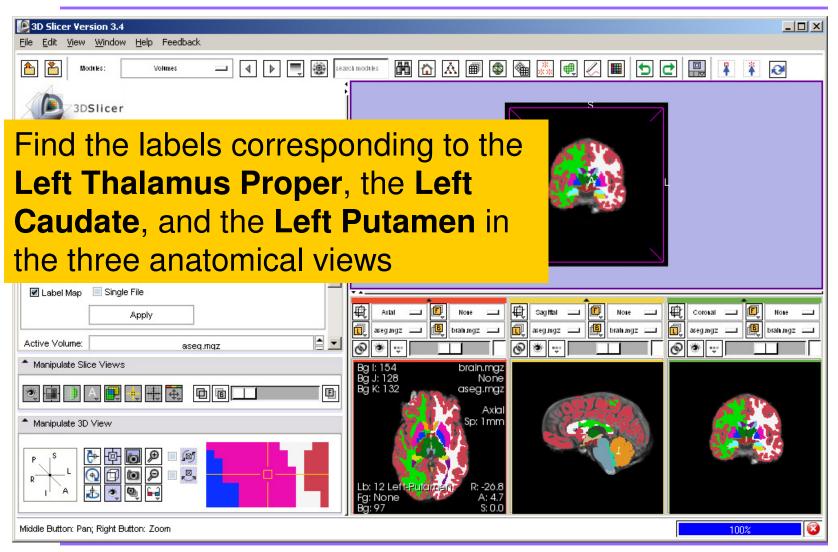
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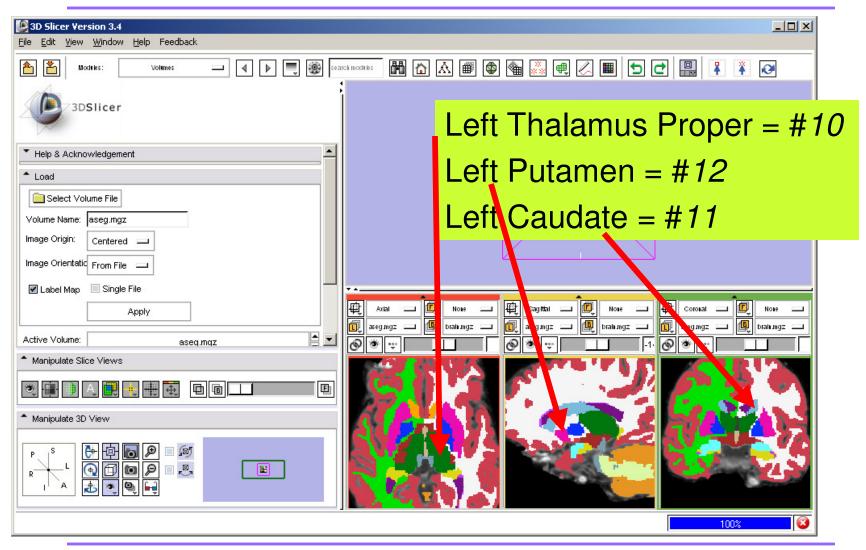




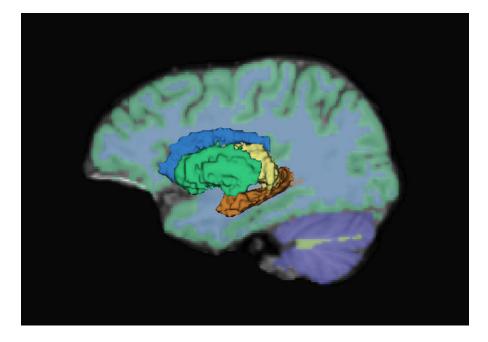










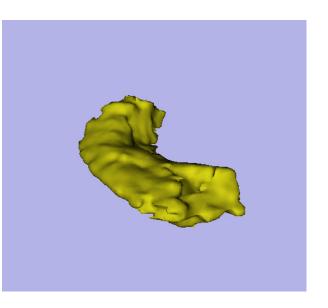


Part 2: Building 3D Models

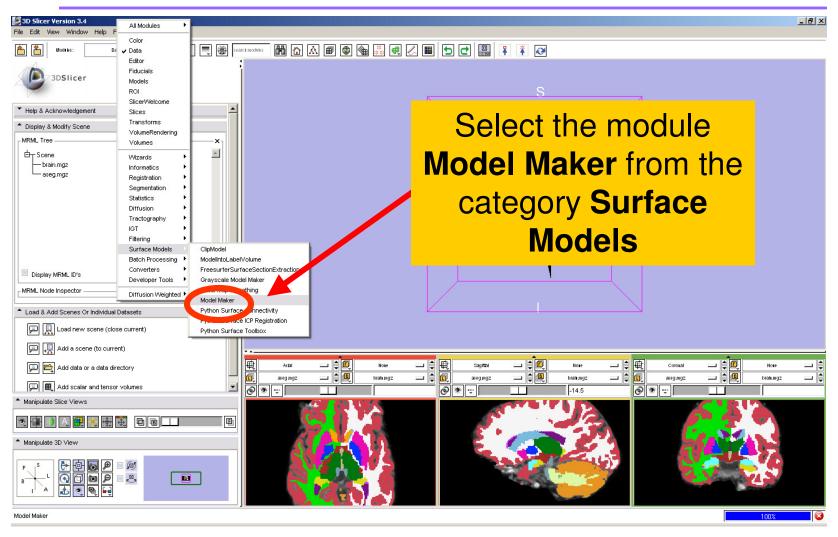


Building 3D Models

- Building a Single Model
- Building Multiple Models

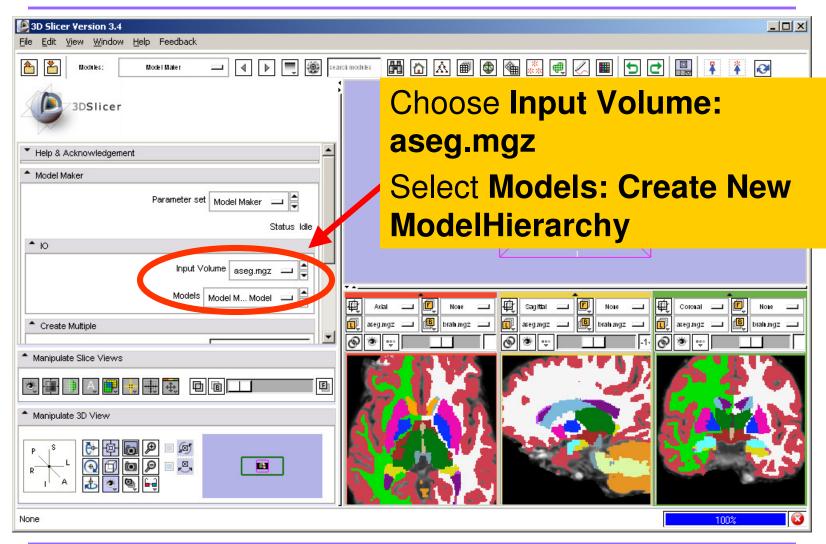






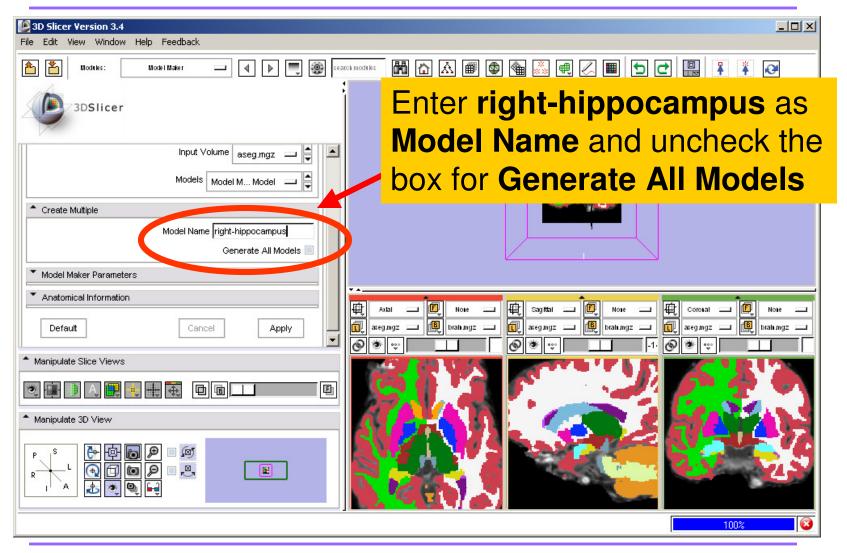
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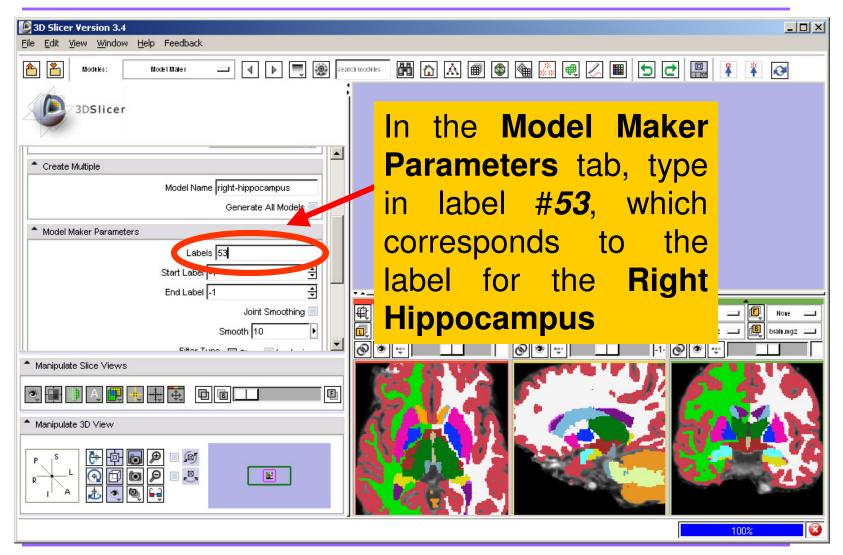


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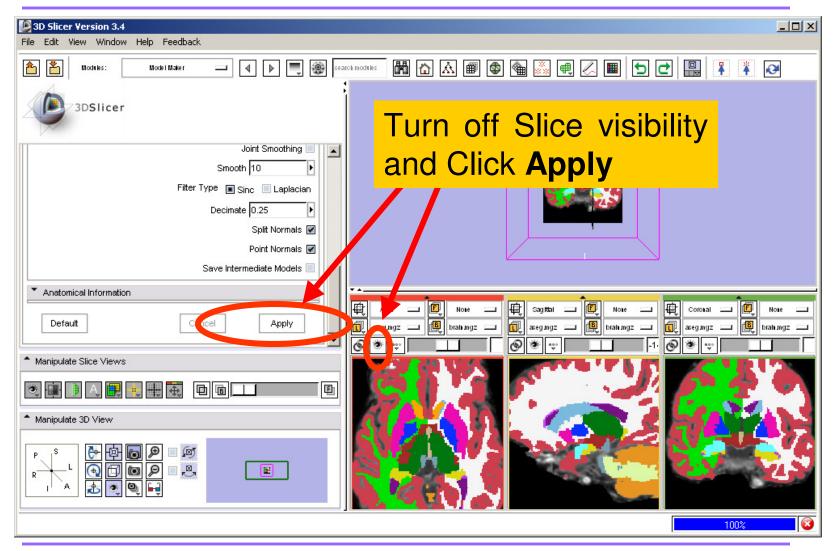






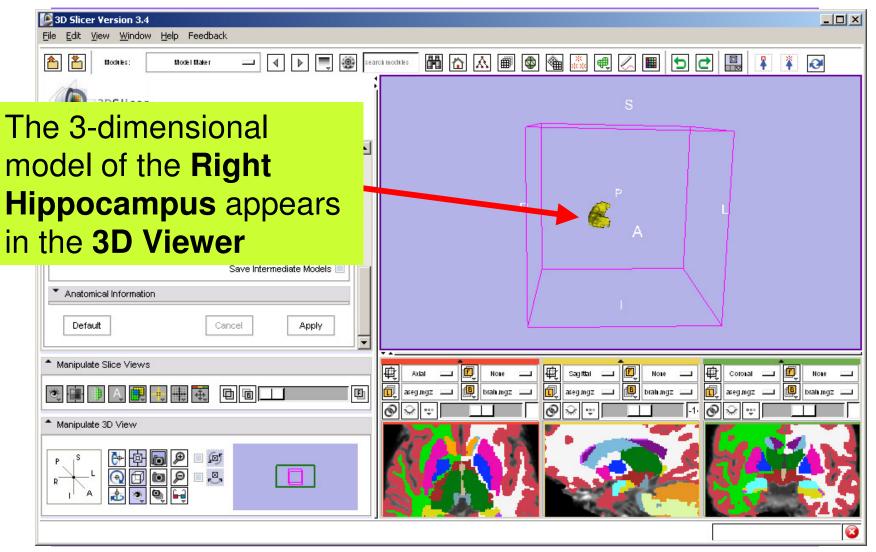










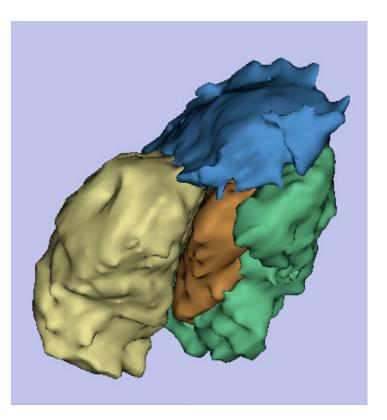


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Building 3D Models

- Building a Single Model
- Building Multiple Models





Building Multiple Models

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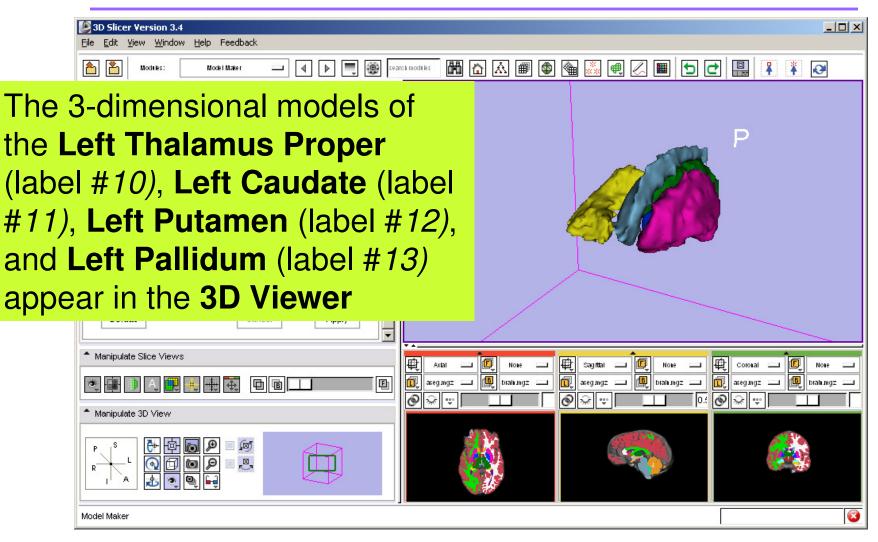
Building Multiple Models

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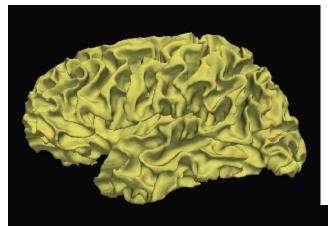


Building Multiple Models



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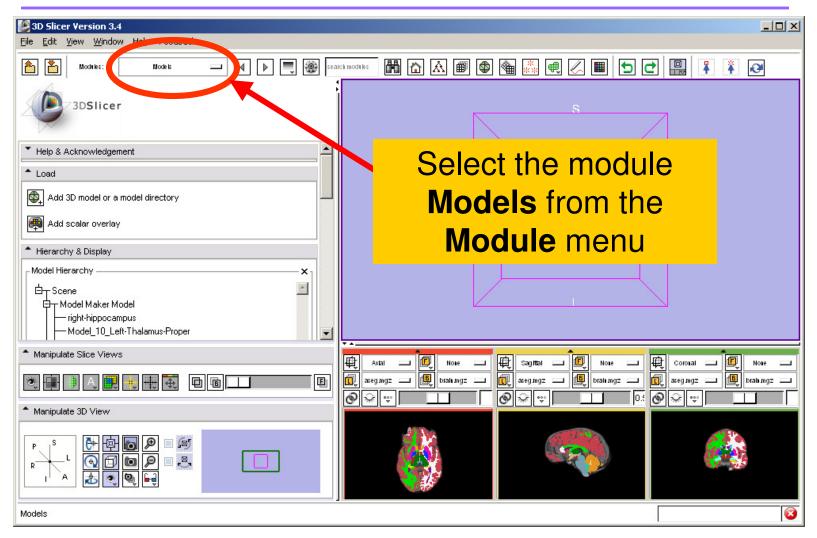


Part 3: Loading FreeSurfer Surfaces and Visualizing Parcellation Maps

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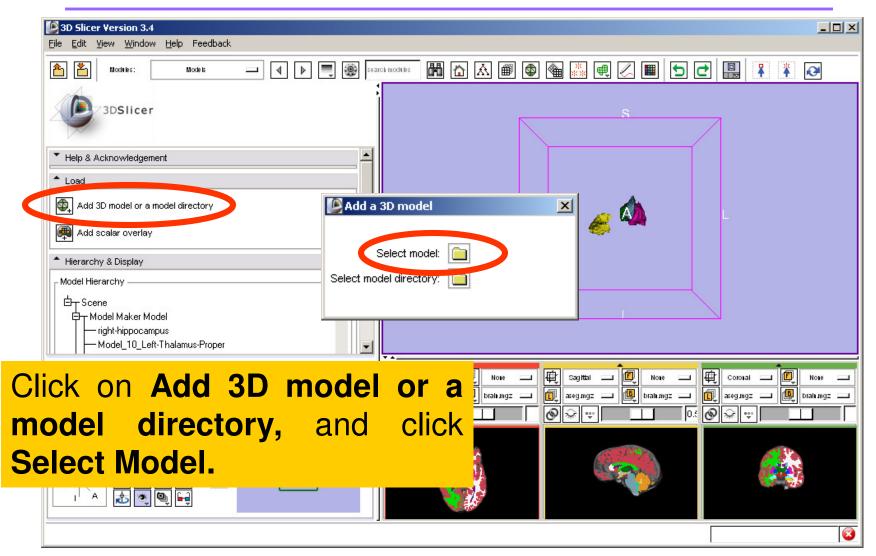
Building Multiple Models



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Loading Surfaces





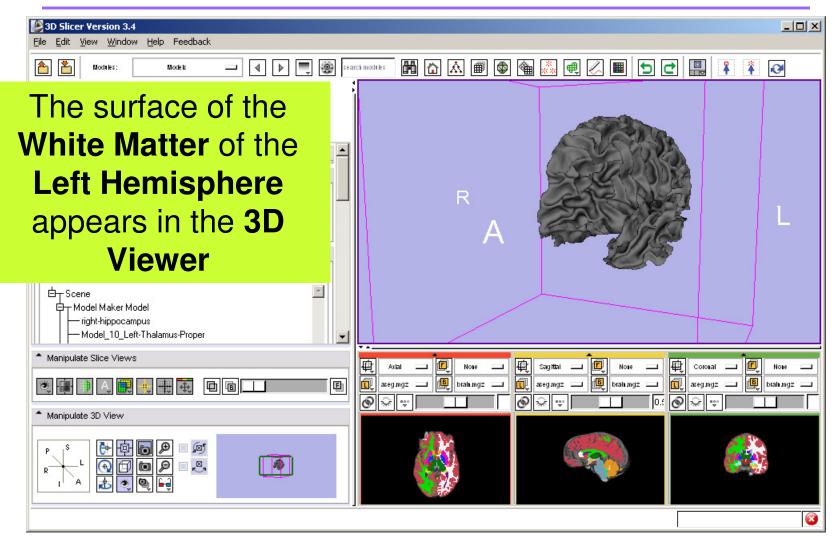
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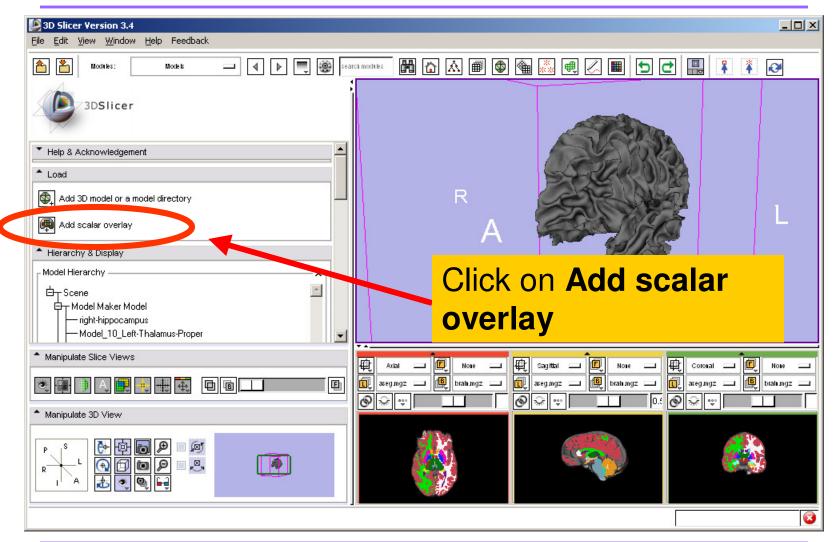


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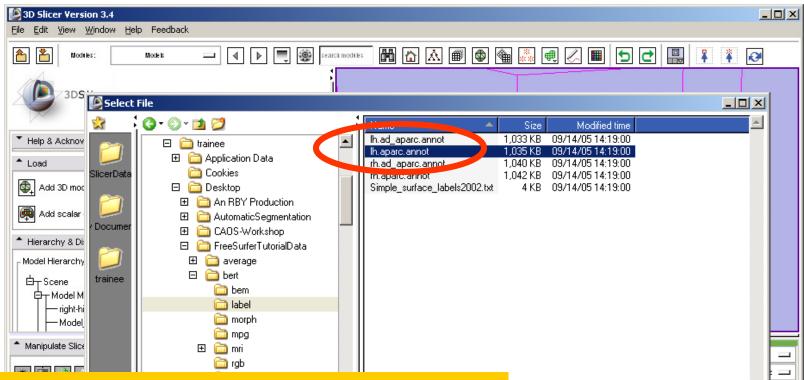




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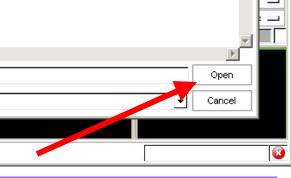




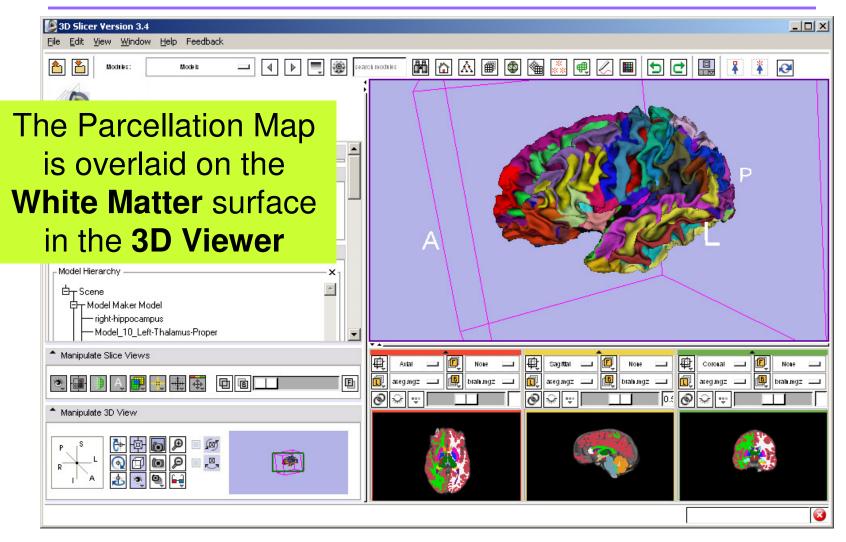
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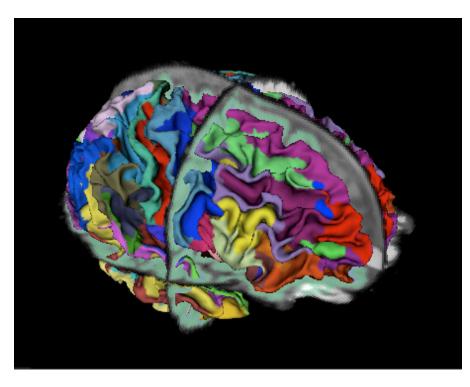
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Part 4: Automatic Data Loading via a Generic Scene File

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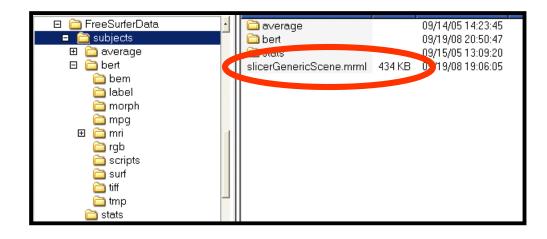


• The generic scene file works by looking in the subject directory created by **FreeSurfer**, and loading all available volumes and models based on known subdirectory names and filenames.

• The file slicerGenericScene.mrml will work properly if the subdirectory names and filenames have not been changed by the user.



Copy the file **slicerGenericScene.mrml** into the directory /**subjects**/ of our tutorial dataset.

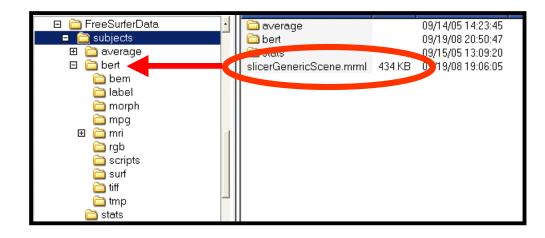


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Copy the file **slicerGenericScene.mrml** located in the directory /**subjects**/, into the directory /**subjects**/bert/ of our sample subject.

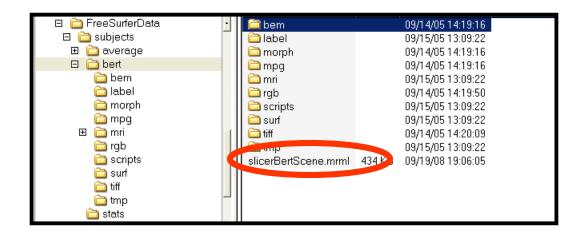


/subjects/bert/

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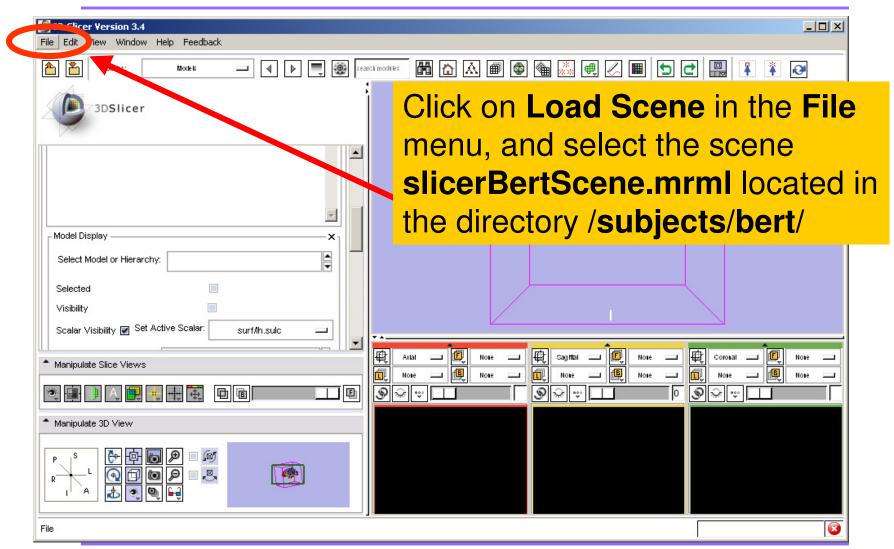
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/subjects/bert/

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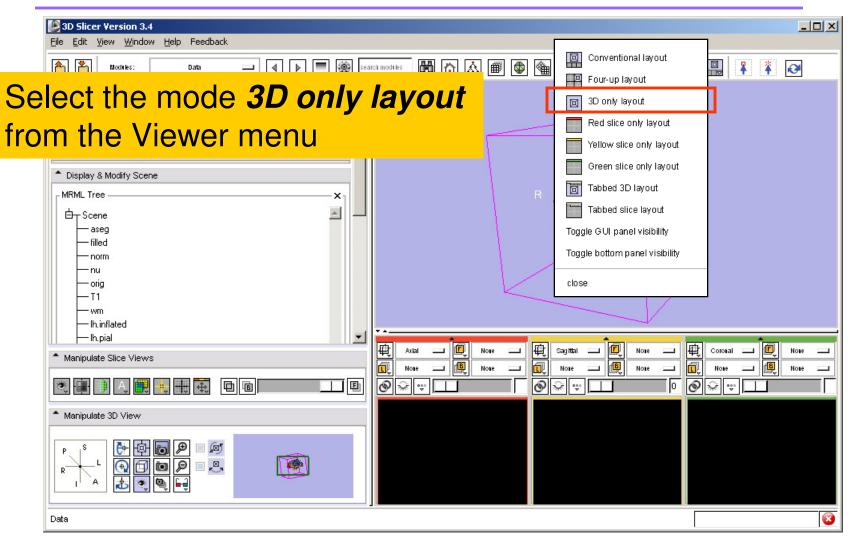
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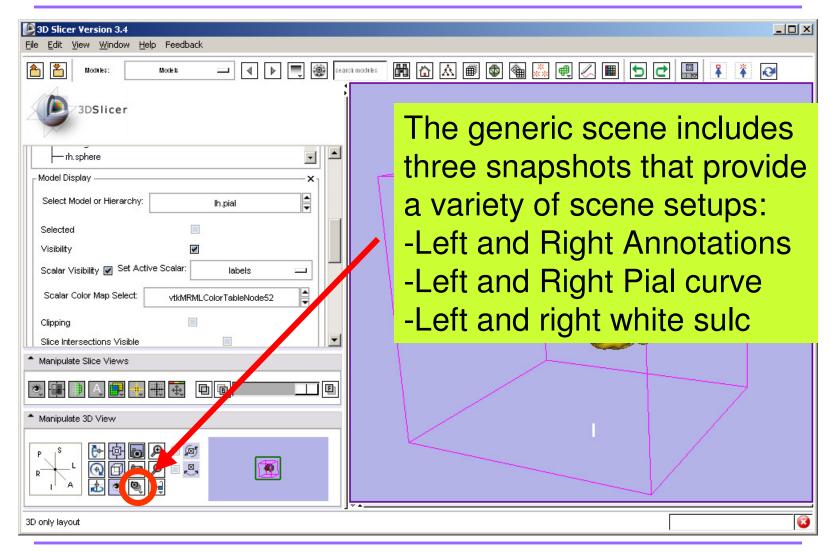
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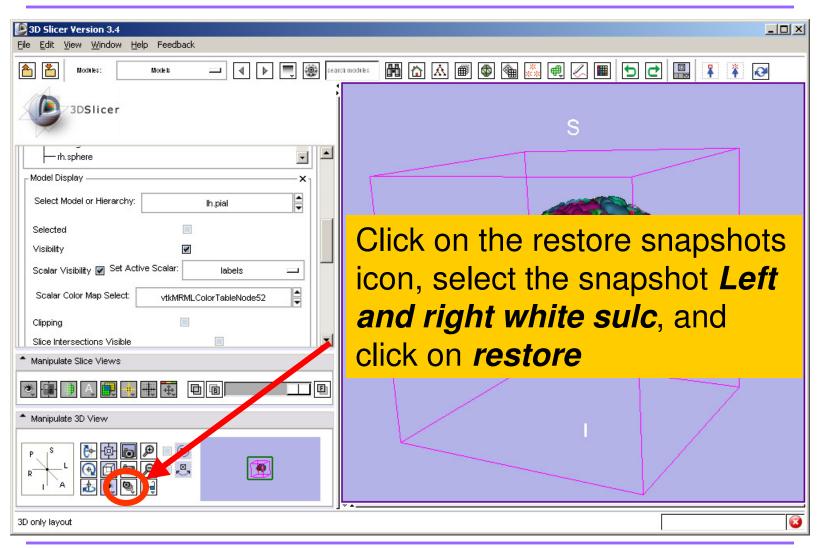
Pujol S et al.



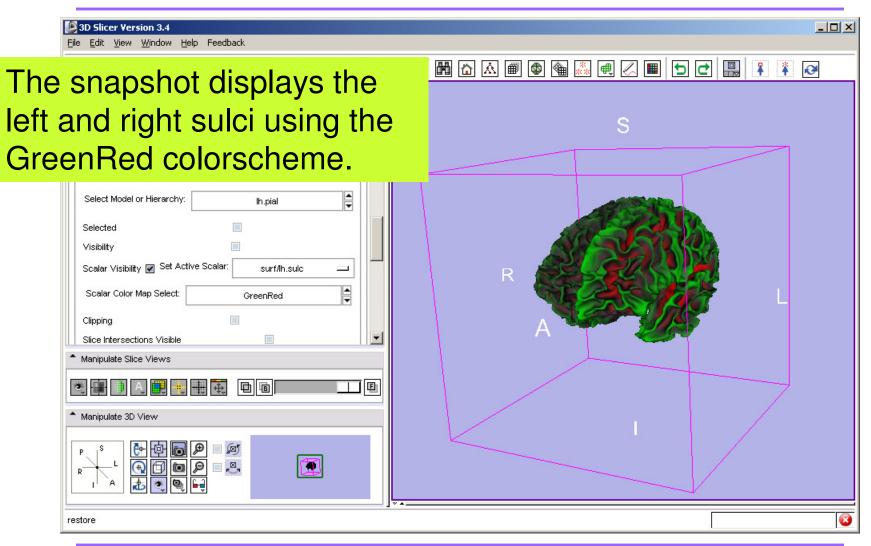


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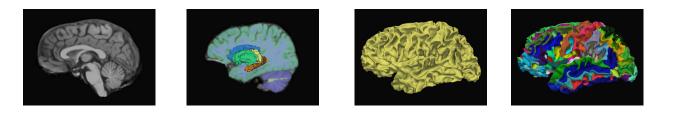
From FreeSurfer, Slicer3 can load:

• All of the above, via a scene file..... •



Conclusion

- 3D visualization of brain segmented surfaces and parcellation maps
- Intuitive graphical user interface to interact with FreeSurfer data
- Multi platforms open-source environment



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