

How to Make 3D Brain Models



by Rebecca Martin

Disclaimer: this is pretty hacky but gets the job done.

1. Instructions I used first: <http://imgur.com/a/3mFsX>.
2. Run anatomical through Freesurfer
3. Convert rh.pial and lh.pial to .stl files using mris_convert (e.g. mris_convert lh.pial lh.pial.stl)
4. Open meshlab
 - a. import stl files (import mesh)
5. Merge two stl files (to make a single brain rather than 2 hemis):
 - a. Go to "Import Mesh" to open all your .stl files. Go to Filters -> Mesh Layer -> Flatten Visible Layers' Click "apply" Export Mesh as... -> merged.stl - See more at: <http://3dprintingwizard.com/tutorial-merge-stl-files/#sthash.kg18s9KB.dpuf>
 - b. reduce faces and stuff to less than 20,000 (though I didn't do that b/c it made the brain look weird)
6. To smooth:
 - a. render, render mode, smooth
7. Save new version as .stl file (e.g. brain.smoothed.stl)
8. Open Meshmixer and import merged and smoothed brain
9. To hollow:
 - a. Go to Edit -> hollow
 - b. Make exit holes if you need to (i.e. if you are using sandstone). Look at this video for more guidance <https://www.youtube.com/watch?v=l4RCLuUwETU> (hollowing happens around 8:15 or so)
10. To reduce size so your model doesn't cost a million dollars:

- a. Navigate to Print
 - b. Select the type of printer you are going to use (I use Shapeways)
 - c. Click Repair to make sure there aren't any big errors or problems (this will take a while)
 - d. From there you can reduce the size or wait until you press "review cart and order" and then get to Shapeways menu to reduce size
11. To print:
- a. Set up an account with Shapeways
 - b. click "review cart and order." This will take you to the Shapeways page and you can use the repair programs on their site and the scale tool to get your brain to the size, material, and color you want.
 - c. Print and enjoy!
12. These meshmixer videos are helpful for getting you used to the software:
- <https://www.youtube.com/watch?v=OICjuIIVDuw&list=PLu8TYSQ5jCFjdQBHsLoybhdKXOTmpTRlb>

