




# LittleBrain manual

1. To download Docker, go to: <https://www.docker.com/community-edition> and scroll down until you see these options. Download the Docker version that is compatible with your operating system (e.g. windows, mac):


## Download Docker Community Edition


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An integrated, easy-to-deploy Docker development environment on the Mac for building, assembling, and shipping applications.

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2. Once the program “Docker” is installed, start the program “Docker” in your computer. Then open the terminal of your computer (mac: look for “Terminal”; windows: look for “Command Prompt”). Type the following in your terminal in order to download the LittleBrain docker container (this will use approximately 2.5GB of space):

If using mac or linux, type this:

```
docker pull xaviergp/littlebrain_v2
```

If using windows, type this:

```
docker.exe pull xaviergp/littlebrain_v2
```

3. To start LittleBrain, follow these steps:

3.1 - Start the program “Docker” in your computer.

3.2 - When Docker is running (it may take a while for Docker to start running), open the terminal of your computer (mac or linux: look for “Terminal”; windows: look for “Command Prompt”). Then type the following in your terminal:

If using mac or linux, type this in the terminal:

```
docker run --rm -p 8888:8888 xaviergp/littlebrain_v2
```

If using windows, type this in the terminal:

```
docker.exe run --rm -p 8888:8888 xaviergp/littlebrain_v2
```

3.3 - Copy the password that has been generated after the word “token” shown in your terminal (shown in red in the image below).

```
INFO: /root/matlab/startup.m does not exist ... creating
Some packages in this Docker container are non-free
If you are considering commercial use of this container, please consult the relevant
license:
https://fsl.fmrib.ox.ac.uk/fsl/fslwiki/Licence
[I xx:xx:xx.xxx NotebookApp] Writing notebook server cookie secret to
/root/.local/share/jupyter/runtime/notebook_cookie_secret
[I xx:xx:xx.xxx NotebookApp] Serving notebooks from local directory: /src
[I xx:xx:xx.xxx NotebookApp] 0 active kernels
[I xx:xx:xx.xxx NotebookApp] The Jupyter Notebook is running at:
[I xx:xx:xx.xxx NotebookApp] http://62136cb37e2d:8888/?token=72c3aa5b5d18320d2ff5a2fa2beff5db7040ba7fb48d1370
[I xx:xx:xx.xxx NotebookApp] Use Control-C to stop this server and shut down all
kernels (twice to skip confirmation).
[C xx:xx:xx.xxx NotebookApp]

Copy/paste this URL into your browser when you connect for the first time,
to login with a token:
http://64156cb37e3d:8888/?token=72c3aa5b3d18320d2ff5a2fa2beff5db7040ba7fb48d1370&token=72c3aa5b3d18320d2ff5a2fa2beff5db7040ba7fb48d1370
```

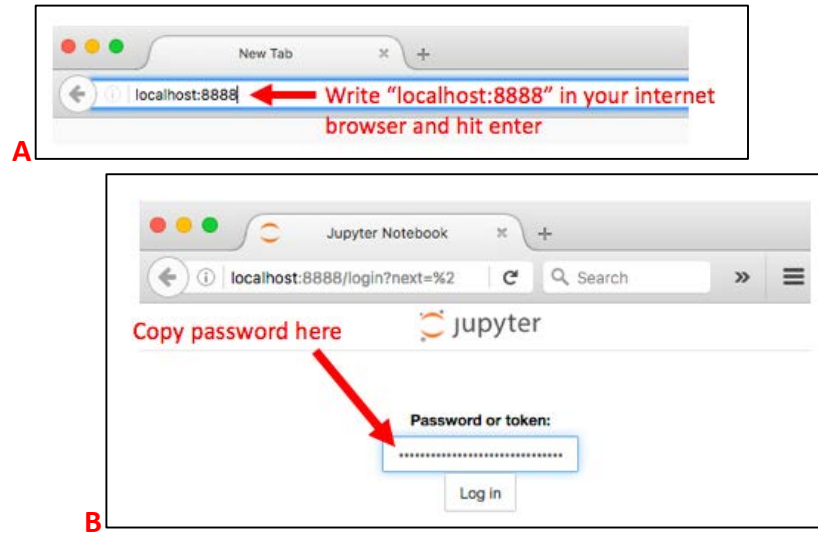
Copy this password

(not this password)

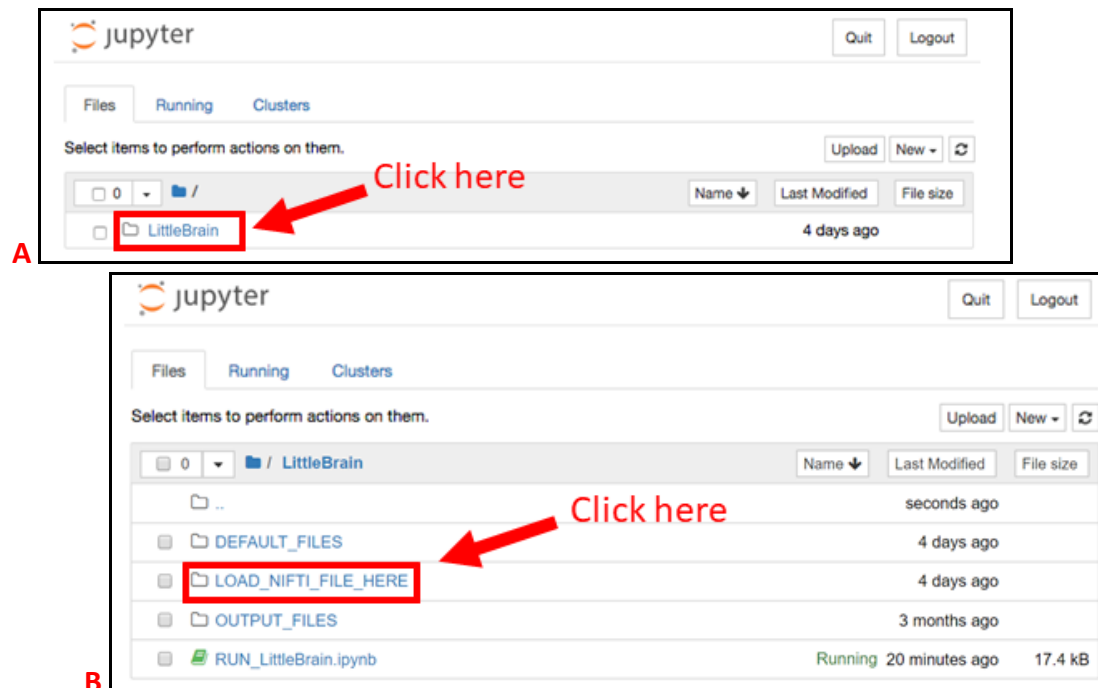
If an error occurs, re-start Docker and repeat step 3 (this will solve the issue if port 8888 is being used by a previously opened jupyter notebook).

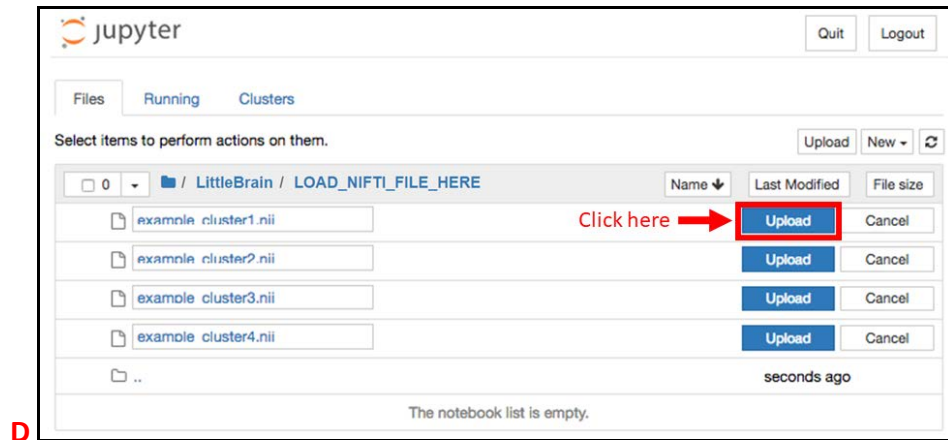
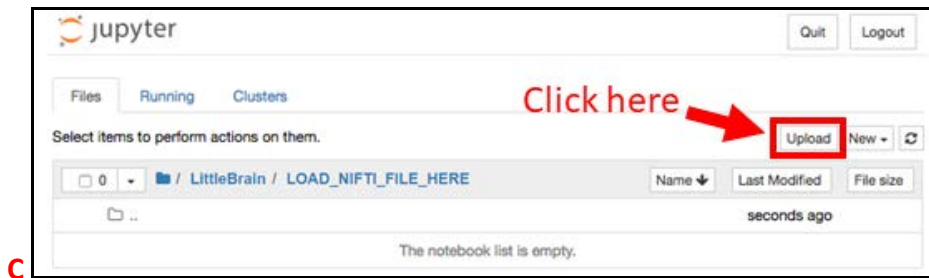


**3.4 - Open your internet browser (for example, firefox), type the address “localhost:8888”, and copy the password in the text box that will appear:**

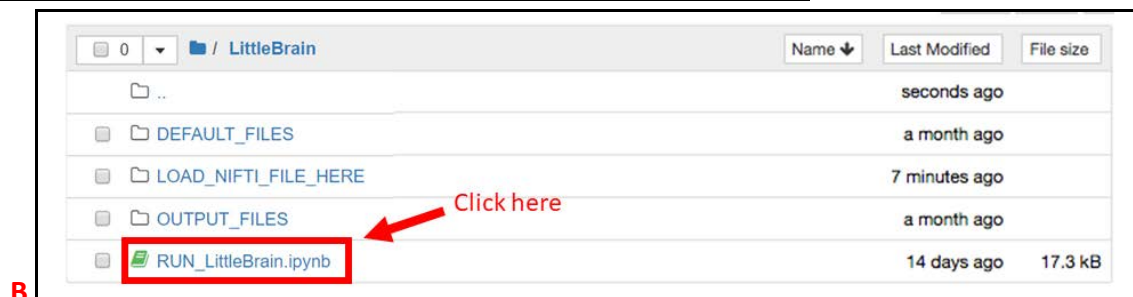
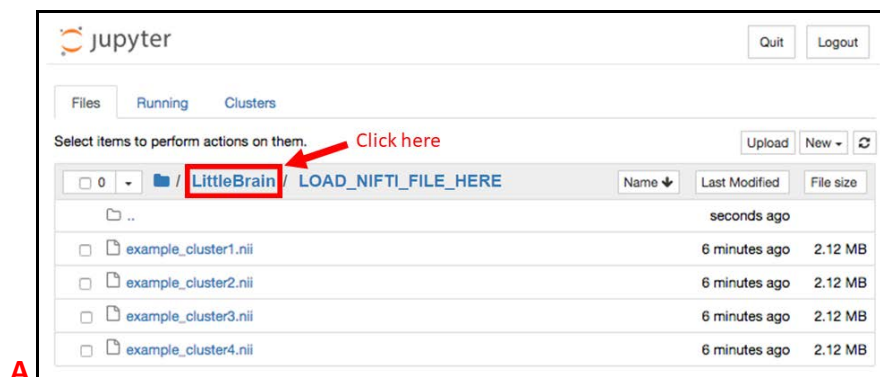


**4. To upload the clusters that you want to map, go to “LittleBrain”, then go to “LOAD\_NIFTI\_FILE\_HERE”, and then click “Upload”.**



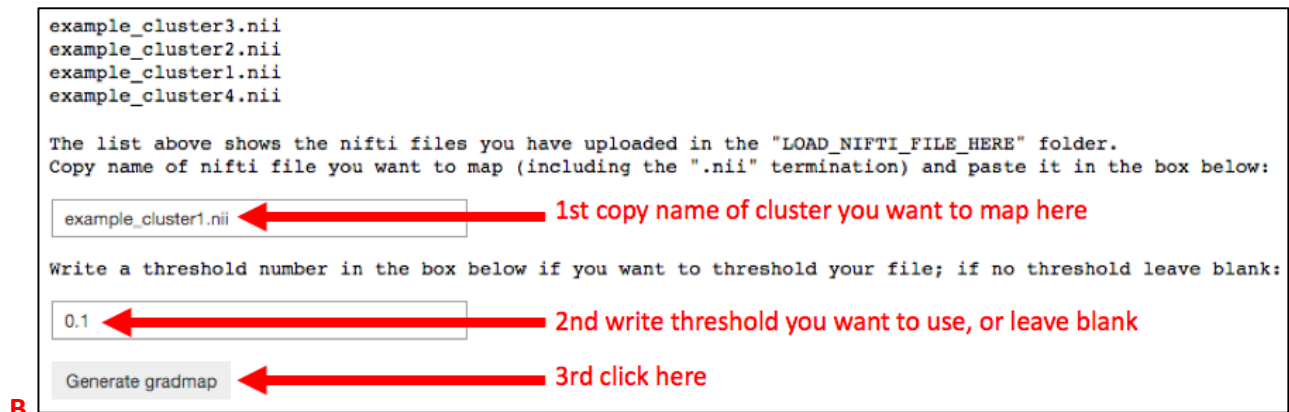
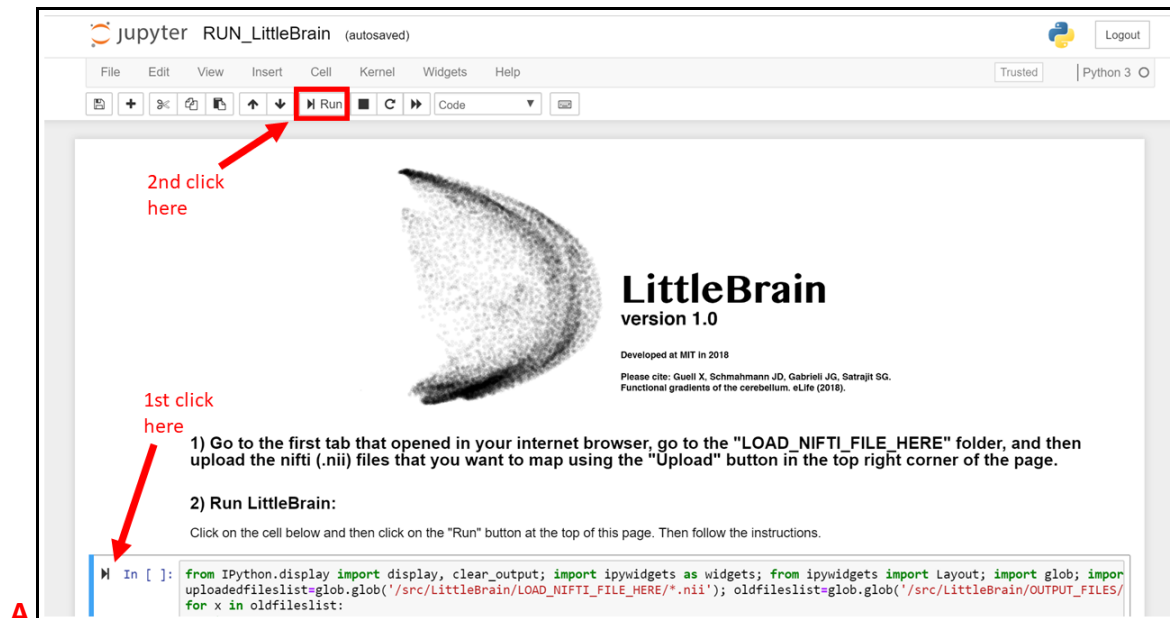


5. To start LittleBrain, go back to the “LittleBrain” folder and click “RUN\_LittleBrain”

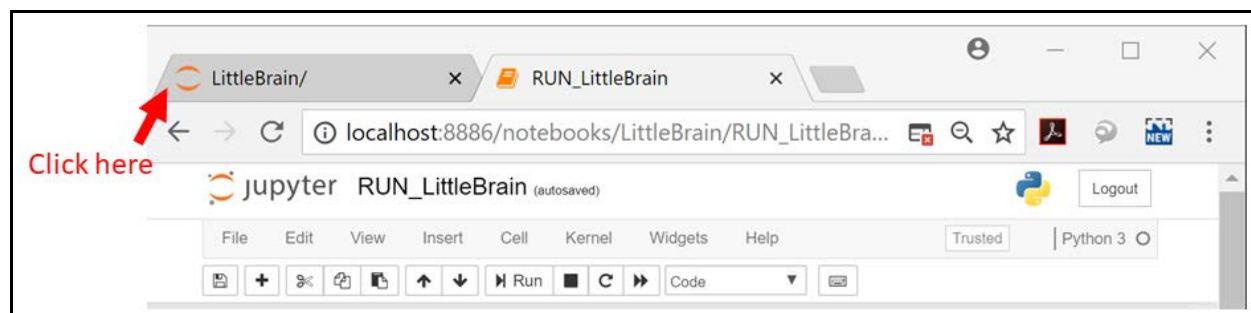




## 6. Follow the instructions that will appear in the screen.



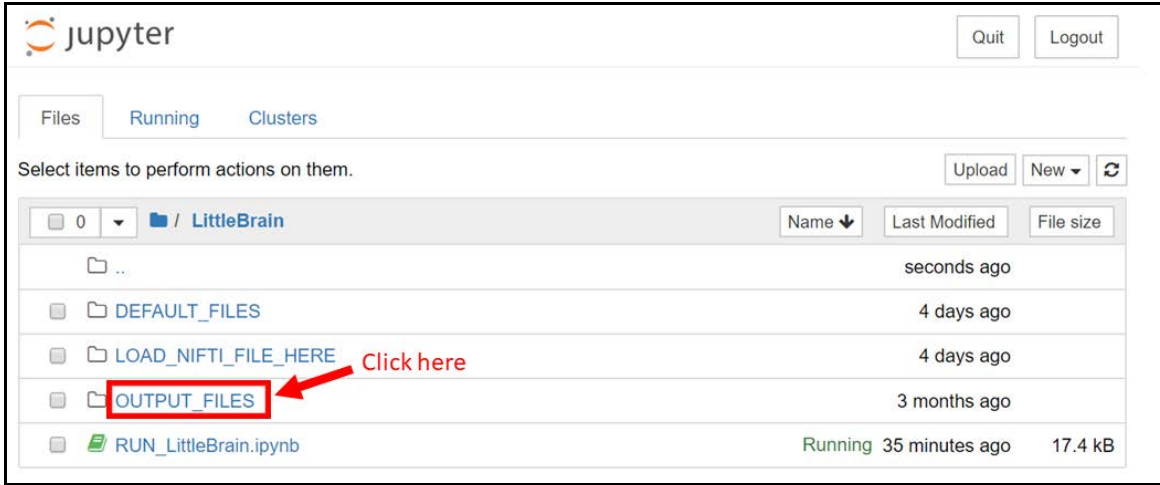
## 7. To download the scatterplot, go to the other tab that was opened in your browser:





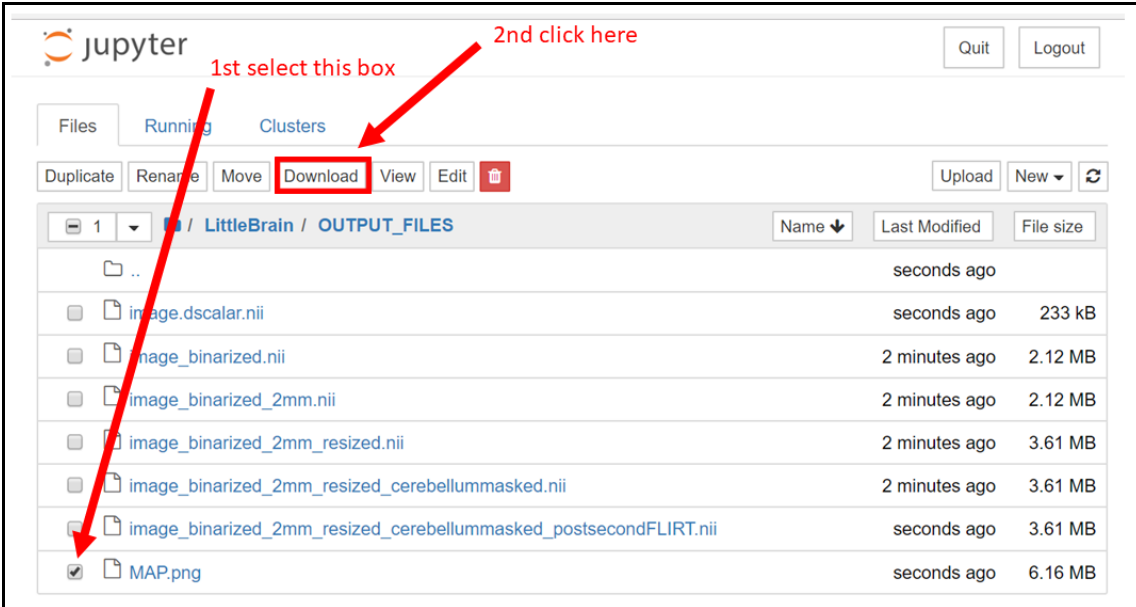
## 8. Go to the “OUTPUT\_FILES” folder, and download “MAP.png”:

**A**



The screenshot shows the Jupyter web interface. At the top, there are 'Quit' and 'Logout' buttons. Below them are tabs for 'Files', 'Running', and 'Clusters'. A message says 'Select items to perform actions on them.' with 'Upload', 'New', and a refresh icon. The file list shows the current directory is '/ LittleBrain'. The files listed are: '..' (seconds ago), 'DEFAULT\_FILES' (4 days ago), 'LOAD\_NIFTI\_FILE\_HERE' (4 days ago), 'OUTPUT\_FILES' (3 months ago), and 'RUN\_LittleBrain.ipynb' (Running, 35 minutes ago, 17.4 kB). A red box highlights the 'OUTPUT\_FILES' folder, and a red arrow points to it with the text 'Click here'.

**B**



The screenshot shows the Jupyter web interface with the 'OUTPUT\_FILES' folder selected. The file list shows the current directory is '/ LittleBrain / OUTPUT\_FILES'. The files listed are: '..' (seconds ago), 'image.dscalar.nii' (seconds ago, 233 kB), 'image\_binarized.nii' (2 minutes ago, 2.12 MB), 'image\_binarized\_2mm.nii' (2 minutes ago, 2.12 MB), 'image\_binarized\_2mm\_resized.nii' (2 minutes ago, 3.61 MB), 'image\_binarized\_2mm\_resized\_cerebellummasked.nii' (2 minutes ago, 3.61 MB), 'image\_binarized\_2mm\_resized\_cerebellummasked\_postsecondFLIRT.nii' (seconds ago, 3.61 MB), and 'MAP.png' (seconds ago, 6.16 MB). A red box highlights the 'Download' button in the action bar. A red arrow points to it with the text '2nd click here'. Another red arrow points to the '1' in the file count '1' with the text '1st select this box'.

## 9. Additional options include:

- Check transformations (cerebellar masking, 2mm resolution change) that have occurred to the uploaded cerebellar data. This can be visualized by clicking the button “check transformations” after a map is generated.
- Generate non-binary maps. These can be generated by clicking the button “see nonbinary map” after a map is generated.
- Download Gradient 1 and Gradient 2 values for the clusters that have been mapped. These values can be downloaded from the “OUTPUT\_FILES” folder as “GRADIENT1\_values.csv” and “GRADIENT2\_values.csv”.

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