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Generating Structural Targets

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We are still developing and optimizing this protocol

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Abstract

This protocol will provide a basic guide to Generating Structural Targets.

Note: Steps may vary based upon data.

Troubleshooting

Introduction

1 A few things to keep in mind:

This protocol will demonstrate steps that will are most commonly used by the IPA Core for creating a structural target. In this protocol we use T2 data for the example, but keep in mind that structural images can be created by using other types of data and the steps may vary for those images.

In the pipeline of processing data from a sample, it's usually a good idea to start by creating your structural image before doing any TORTOISE processing.

2 Log onto the HPC.

3 In your terminal, go to your directory with raw T2 data.

Import T2 Data

4 First import your T2 Data
Type:

Command

new command name

```
ImportBrukerAnatomical
```

4.1 If you just type:
ImportBrukerAnatomical
It will bring up your options and explain how they are used i.e. -i, -o, and -c

4.2 Type:

Command

new command name

```
ImportBrukerAnatomical -i  folder name/file name_T2 -c 1
```

Extract T2 Data

5 You need to extract the single volume from your T2 data.

5.1 View the T2 image in MRtrix, ITK-SNAP, or MIPAV (MIPAV has different instructions which can be seen in step 7). Look at the different echos, and pick the one that most closely resembles the DTI data.

To open ITK-SNAP, type:

Command

new command name

```
cd /rsgrps/hutchinsone/Singularity_Containers
module load singularity
singularity run nklab-neurotools-v0.4.sif
singularity run nklab-neurotools-v0.4.sif itksnap
Note: For MRtrix you need to type mrview at the end
```

5.2 Type:

Command

new command name

```
ExtractImage -i /directory_name/file_name_T2.nii -v 3
```

Note: The "3" will vary, based upon your image and the specific volume you want to extract

Rigid Registration

6 After your image has been extracted, a rigid registration needs to be made for the image.

7 Opening your T2 image to MIPAV with the following steps:

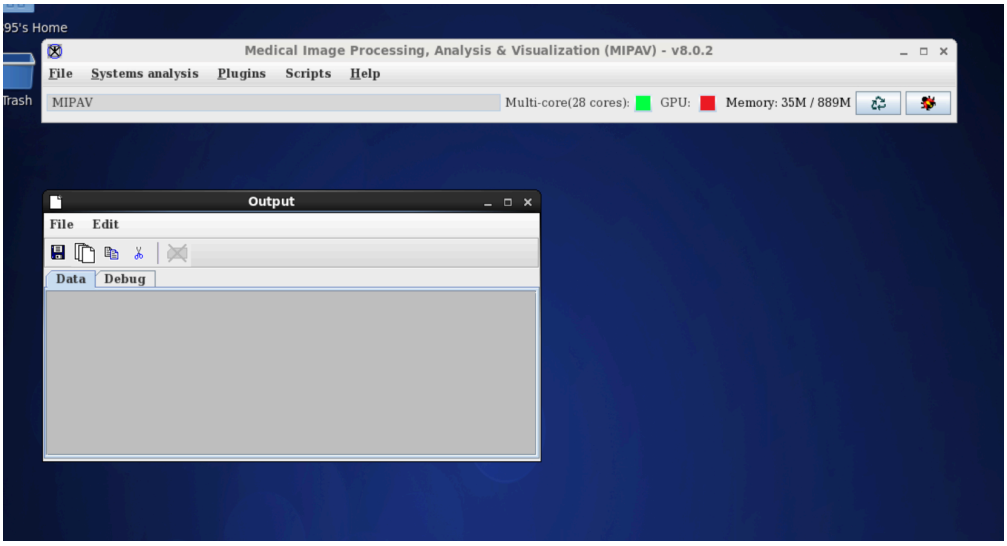
In terminal type:

Command

new command name

```
/rsgrps/hutchinsone/Programming/mipav/mipav
```

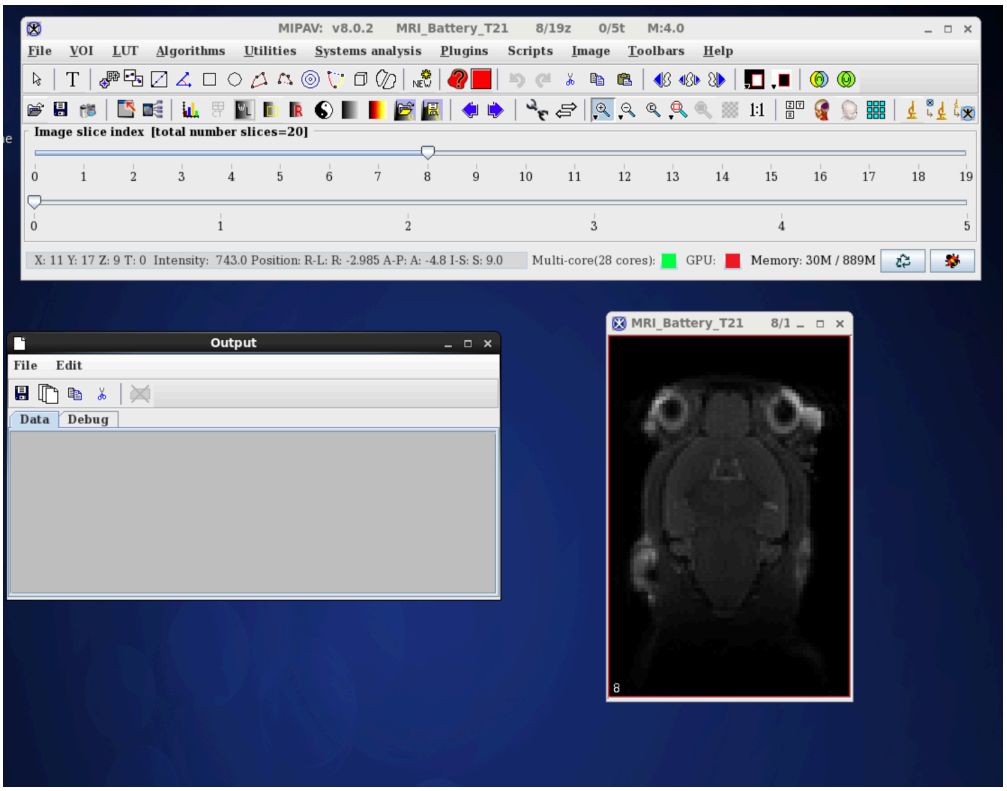
MIPAV should open automatically.



7.1 Go to file>Open image (A) from disk

Go to the directory with data and click on your extracted image.

7.2 NOTE: You should see something similar to the image below.



Correction Notes:

You may have to "fix" your T2 image if MIPAV has switched the slidding bars for the echos and slices.

- This problem can be deduced by sliding the top bar to see if the image filters through the slices or if the image just gets darker.
- If the image gets darker then go to Utilities>4D volume tools>"Swap dims 3↔4." This should fix the swap.

You may need to zoom into your image when you first open MIPAV.

- Simply select the magnifying, shift, and click repeatedly on the image

7.3 You may have to "fix" your T2 image if it is not perfectly aligned. For example if your image is tilted, then you should do a midsagittal line alignment.

Go Algorithms>Brain tools>Midsagittal line alignment

7.4 Keep in mind that here's other ways of creating a the structural image. For example there's the rigid alignment and landmark methods.