


## STEP-BY-STEP GUIDE: Hybrid Desikan-HMAT atlas creation

### Step 1: Extract ROIs from Desikan-Killiany atlas (repeat for every subject)

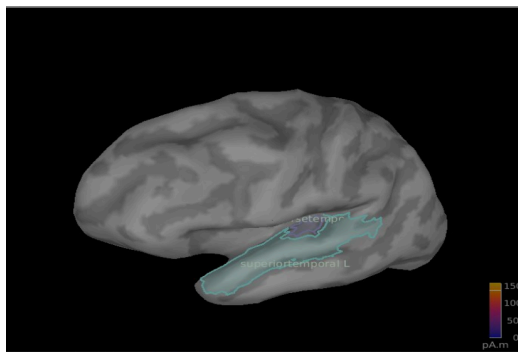
- 1.1 Double click on subject's MN kernel icon
- 1.2 On right sidebar unselect the '**ALL**' and '**SEL**' buttons
- 1.3 Put 3D brain to the side; Choose Desikan-Killiany atlas from dropdown menu
- 1.4 Hold Ctrl key to click only on these 3 structures:

(left) 'pericalcarine'  
(left) 'superiortemporal'  
(left) 'transversetemporal'

Inspect the 3D brain to make sure you have the right structures (colors are arbitrary here):

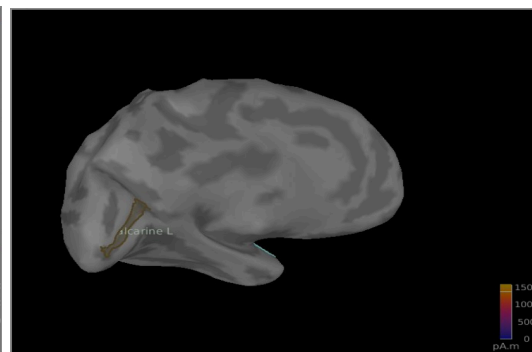
- On the Scout tab sidebar, click the '**SEL**' and  buttons
- Switch to the Surface tab and move the '**Smooth**' knob all the way up to **100%**
- At the bottom, in the '**Resect [X, Y, Z]**' box, click on the hemisphere you're looking at

Type 1 for this view



for Right hemisphere type 3

Type 3 for this view



for Right hemisphere type 1

- 1.5 Click on Atlas > New Atlas > Copy selected Scouts, and WAIT for 5-10 seconds
- 1.6 If you're not warped to it, manually go to the '**Desikan\_Killiany\_02**' atlas
- 1.7 Now click on Atlas > Rename Atlas, and rename it to "**Hybrid Atlas LEFT**"
- 1.8 Go back to the "**Desikan-Killiany**" atlas and repeat all steps for the right hemisphere:

(right) 'pericalcarine'  
(right) 'superiortemporal'  
(right) 'transversetemporal'

Rename to: "**Hybrid Atlas RIGHT**"

**NOTE: you may experience some lag when switching between atlases, just be extra patient!**

## Step 2: Add HMAT structures from 'oscar/DATA/HMAT' (repeat for every subject)

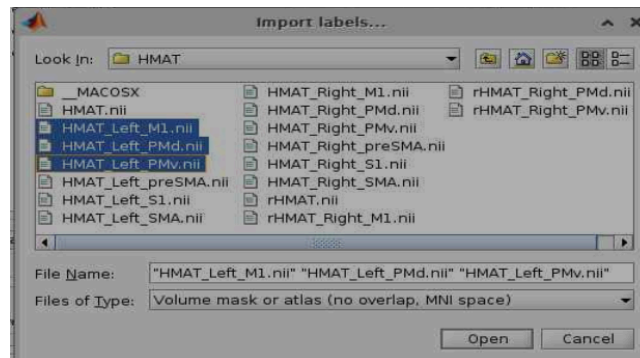
2.1 Select “**Hybrid Atlas LEFT**”

2.2 Click on Atlas > Add Scouts to Atlas

2.3 In the “**Files of type**” dropdown menu, select the last option (MNI, no overlap)

2.4 Locate the HMAT directory and import Left M1, Left PMd and Left PMv together (Hold Ctrl)

This is what you should see:



You will get a pop-up window asking if you want to apply a transformation. Click YES every time.

Because HMAT ROIs are numbered, you will have to assign the proper name. Use this legend:

1	(HMAT_Left_M1)	becomes	Left_M1	(same for right)
1_02	(HMAT_Left_PMd)	becomes	Left_dPMC	(same for right)
1_03	(HMAT_Left_PMv)	becomes	Left_vPMC	(same for right)

**NOTE:** go to the last image on the next page to get a better idea of what it looks like on the GUI

### How to rename an ROI:

2.1 Select the Scout whose name you want to change

2.2 Click on the 'Scout' drop-down menu

2.3 Click on 'Rename' option, rename it, and click OK

2.4 Repeat until you have renamed all 3 HMAT Scouts

Before repeating steps for “**Hybrid Atlas LEFT**”, rename the Desikan ROIs too with this legend:

(left) 'pericalcarine'	becomes	Left_V1
(left) 'superiortemporal'	becomes	Left_STG
(left) 'transversetemporal'	becomes	Left_A1

Now you can repeat all the steps in this section, but for “**Hybrid Atlas RIGHT**”


**ADVANCED:** If you need to, you can consult the HMAT legend on the last page of this guide

### Step 3: Verify that Hybrid Atlases are ready to be saved (repeat for every subject)

3.1 Revise everything you've named or renamed to make 100% sure there are no:

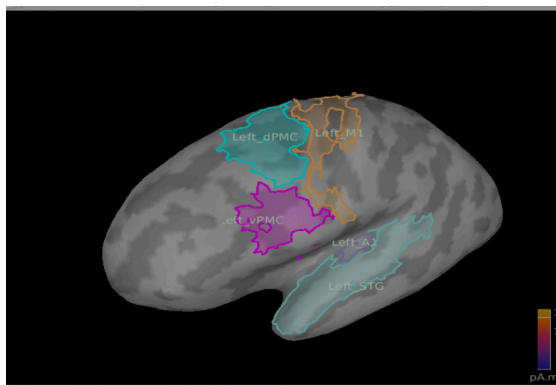
- Typos in the atlas names (e.g. "Hybrid Atlas RIGHT")
- Typos in the scout names (e.g. "Left\_dPCM" instead of "Left\_dPMC")
- Mix-ups with Left vs Right (e.g. "Left\_M1" inside of "Hybrid Atlas Right")

3.2 Verify that the ROIs look good by inspecting the 3D Brain. Use these tips:

- On the Scout tab sidebar, click the **ALL** and  buttons
- Switch to the Surface tab and move the 'Smooth' knob all the way up to **100%**
- At the bottom, in the 'Resect [X, Y, Z]' box, click on the hemisphere you're looking at

This is what you should observe if you're looking at "Hybrid Atlas LEFT" (colors may change):

Type 1 for this view



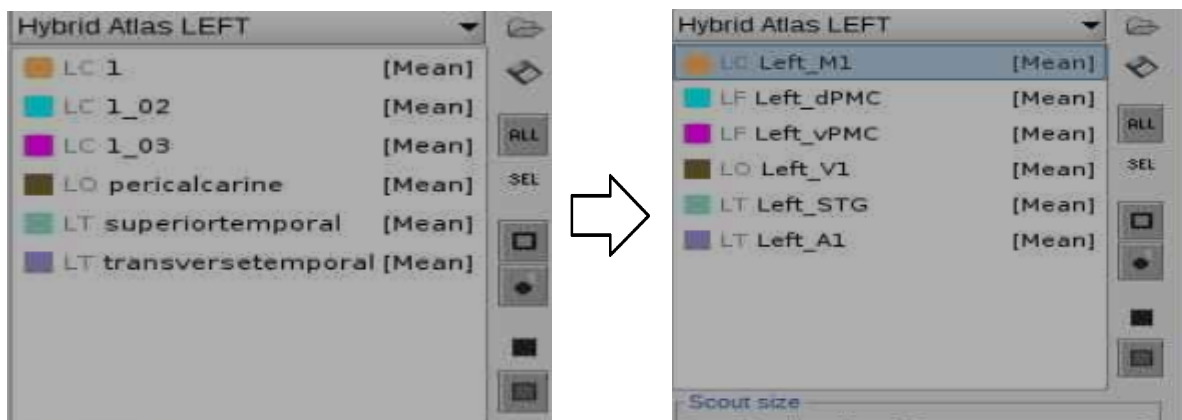
for Right hemisphere type 3

Type 3 for this view



for Right hemisphere type 1

And here's what the Scout menu should look like; note the buttons I've selected on the sidebar:



**NOTE:** you may experience some lag when switching between atlases, just be extra patient!

**Step 4: Save the the modifications** → (Scout tab: Atlas > Save modifications)

**THE END!**

(... now do it all over again for 44 more subjects.)

NOTE: if Desikan Killiany atlas doesn't load within 5-10 seconds for next subject, you have to:

1) close Brainstorm; 2) hit Ctrl+C on the Matlab terminal; 3) re-start Brainstorm

#### **HMAT legend**

Right_M1	1
Left_M1	2
Right_S1	3
Left_S1	4
Right_SMA	5
Left_SMA	6
Right_preSMA	7
Left_preSMA	8
Right_PMd	9
Left_PMd	10
Right_PMv	11
Left_PMv	12