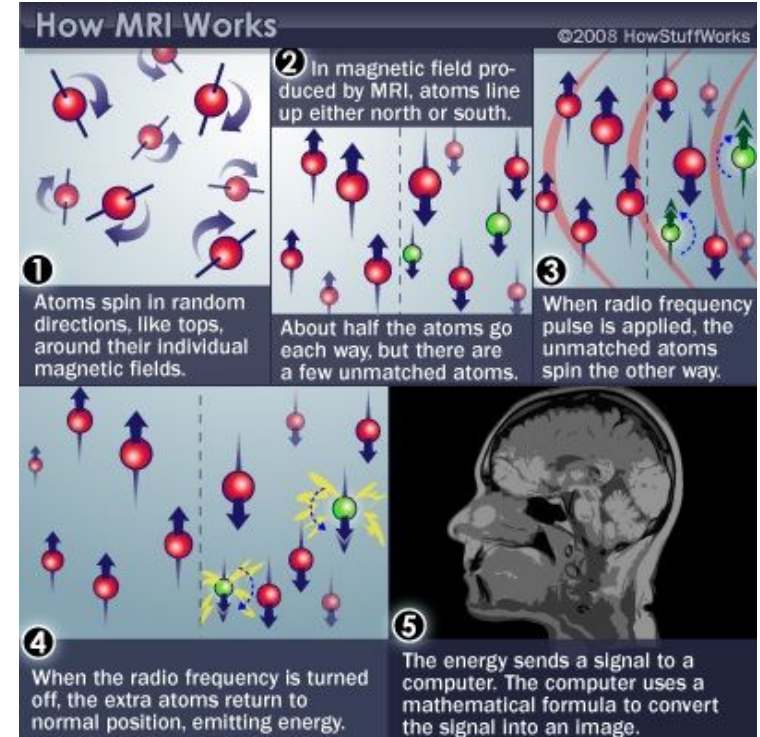


# Creating an Atlas of a Baboon's Brain for PET Imaging



# Background

- Previous Histological Atlases
- MRI: Magnetic Resonance Imaging
- ROI: Region of Interest



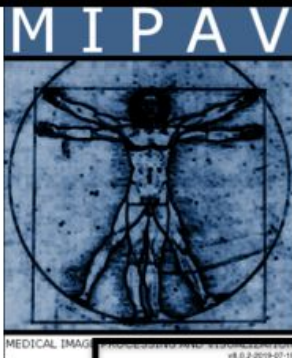


Drawing



Isolate ROI

Transform to Baboon Matrix

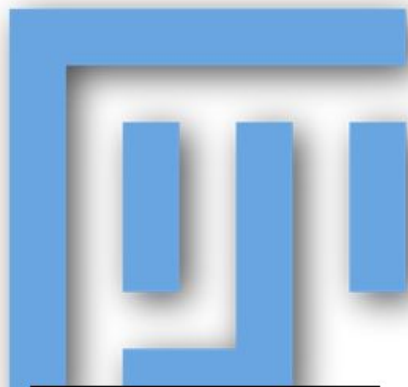
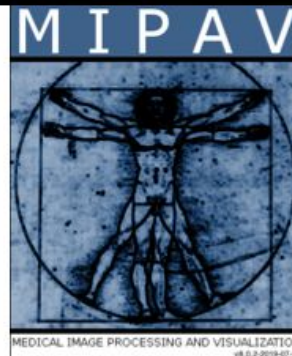


ROEditor

This software is only for research purpose  
and should not be used for clinical studies.

Draw and shrink ROI

Converted from nifti to image file



Smooth ROI

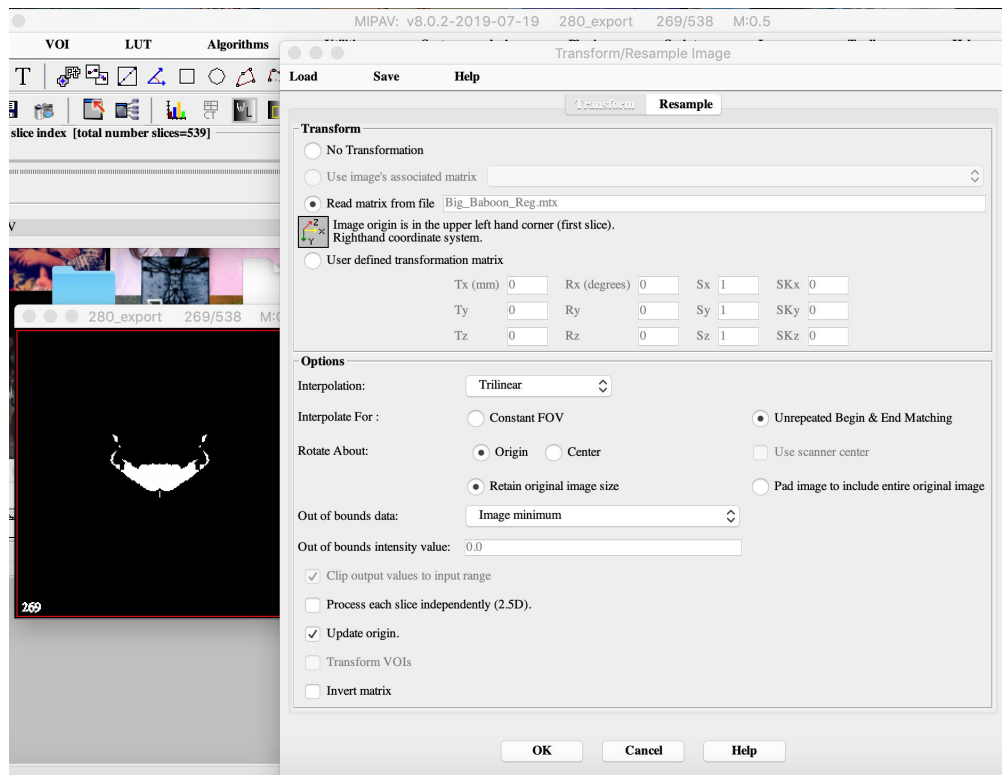


Change decimal values

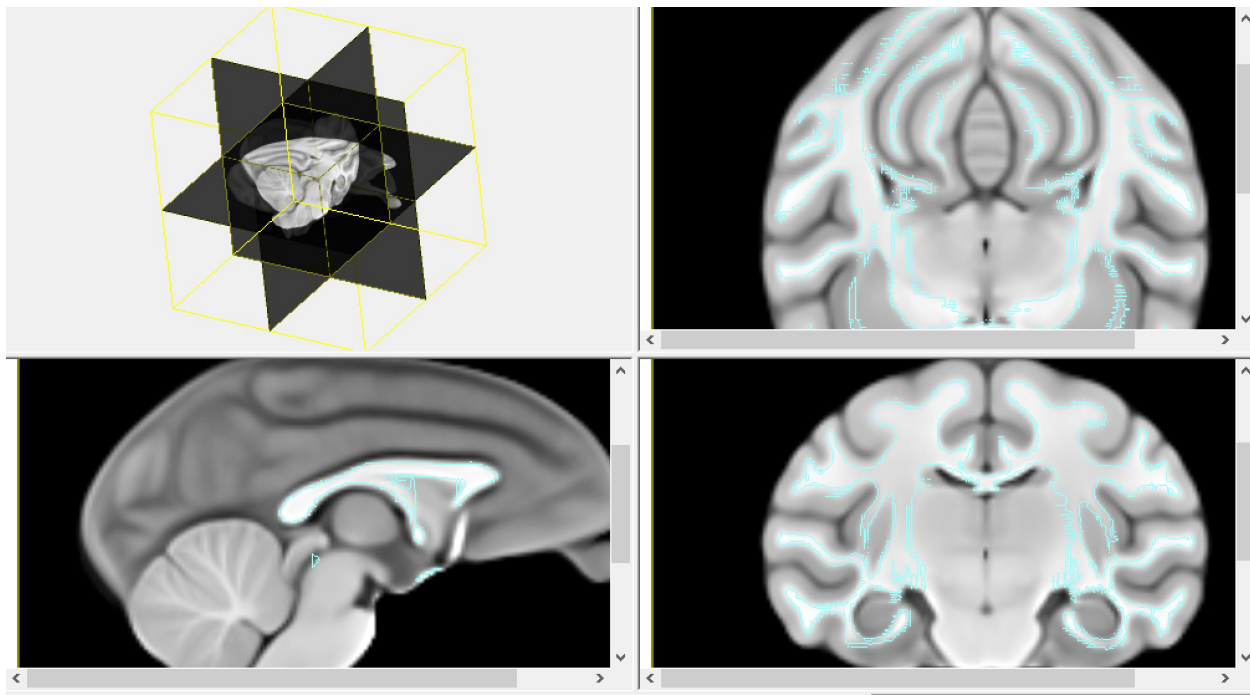
# MATLAB → MIPAV

```
%convert big mask to many small binary masks
%add label we want
A=template;
A(A==1) = 0;
A(7<=A & A<=12 | 14<=A & A<=16 | 23<=A & A<=29 | 31<=A & A<=41 | A==250) =1;
A(A~=1) = 0;
niftiwrite(A,'280_export.nii');
```

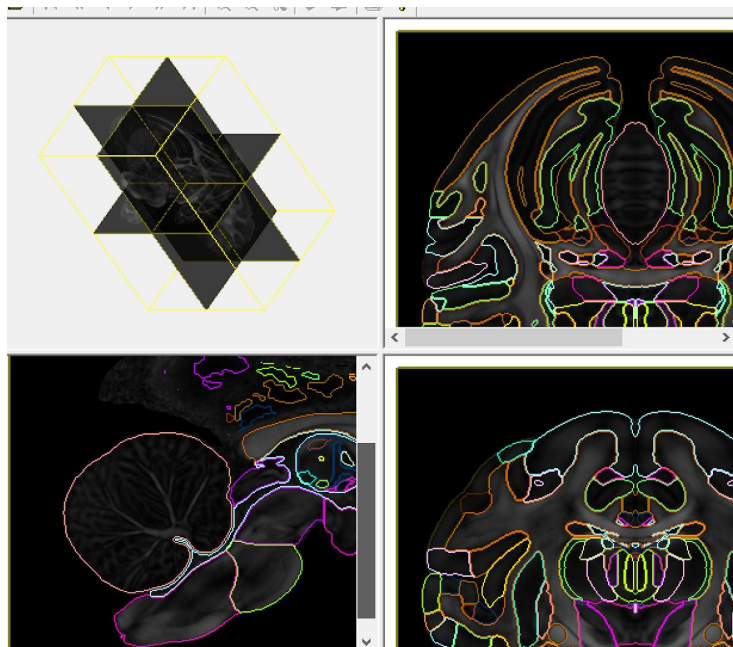
# MIPAV → ROI Editor



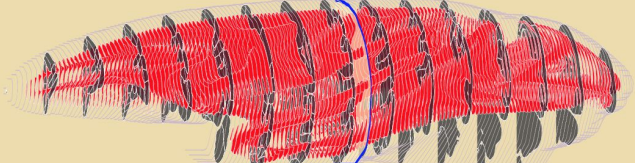
# ROI Editor



# References



[terms of use](#) | [about](#) | [download](#) | [contact](#)

[\[3d brain composer\]](#)

Selected region: **cwm : cerebral white matter**


Search:

Slice:  -10.2 mm ant. ac


Slice spacing:

Rotate view:

Available plugins

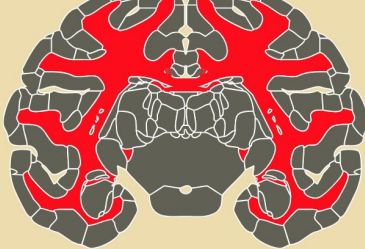


RegionTree



Properties

**borders** GRE FA DWI b0 labels

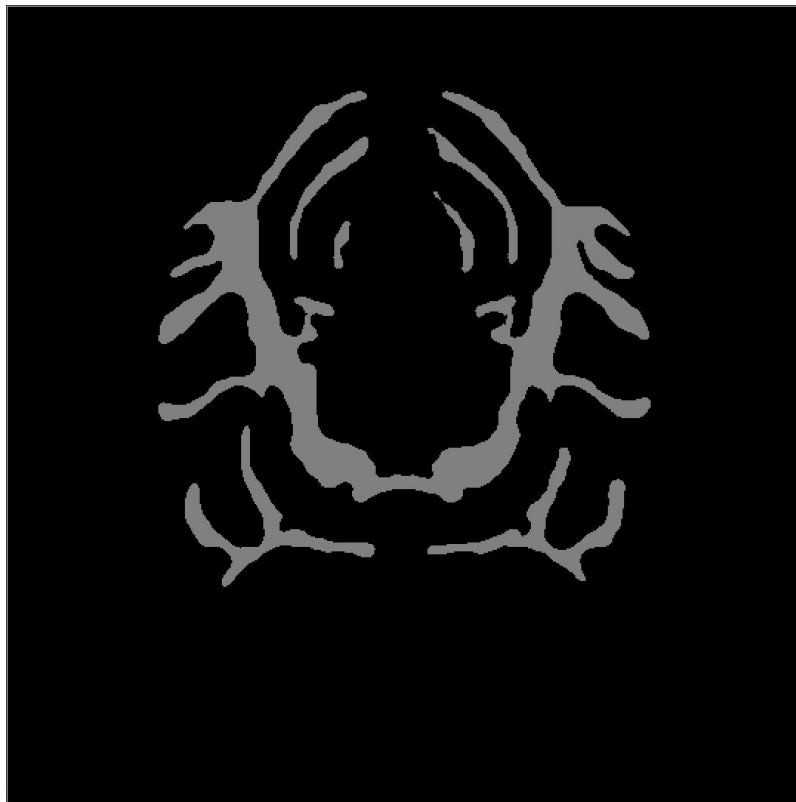


**Regions in this slice (region hierarchy)**

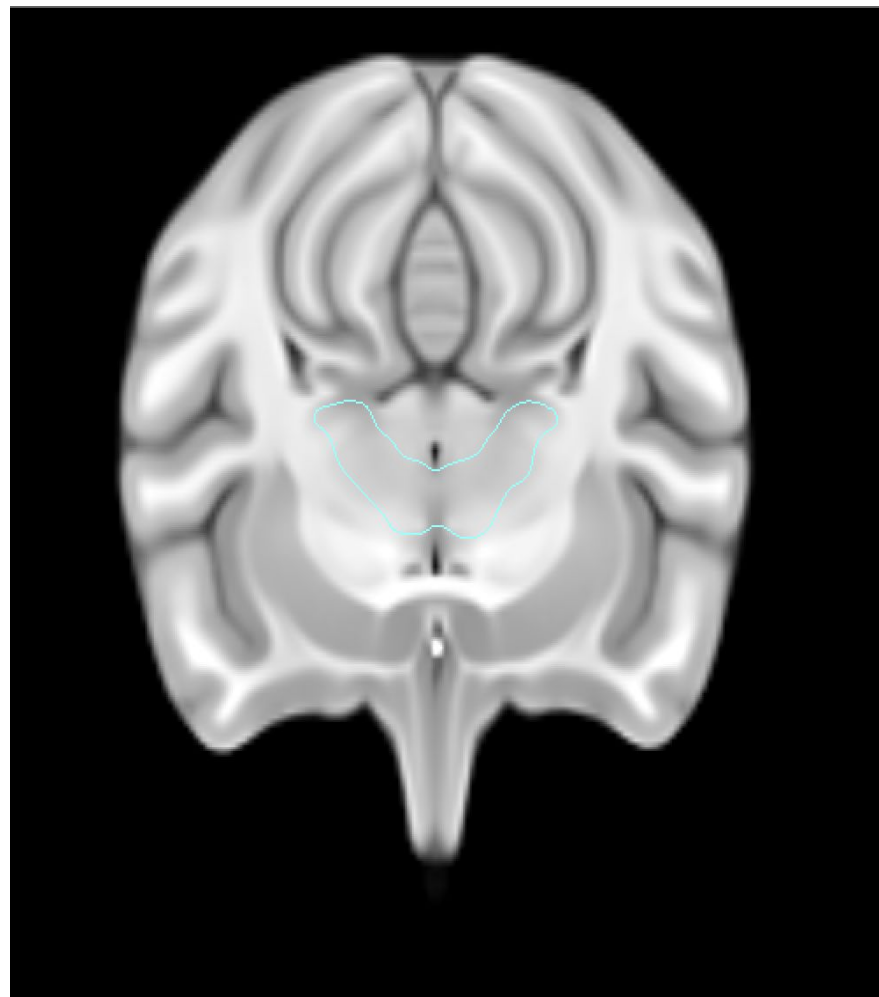
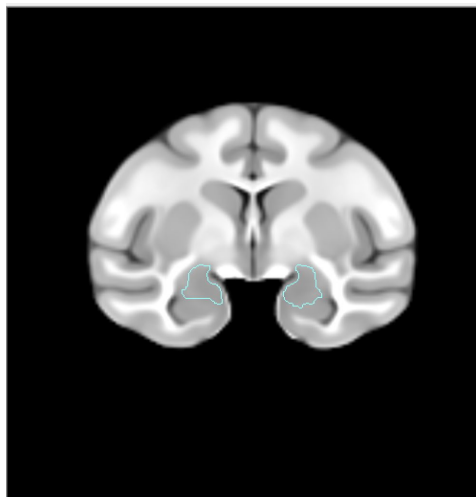
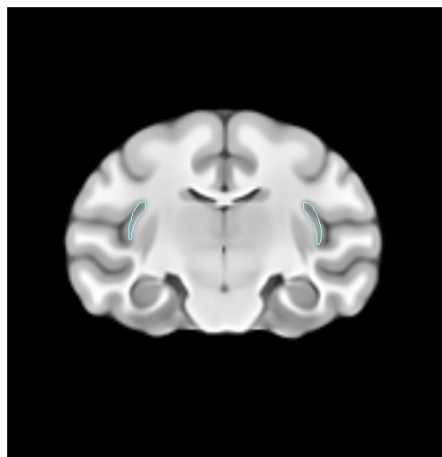
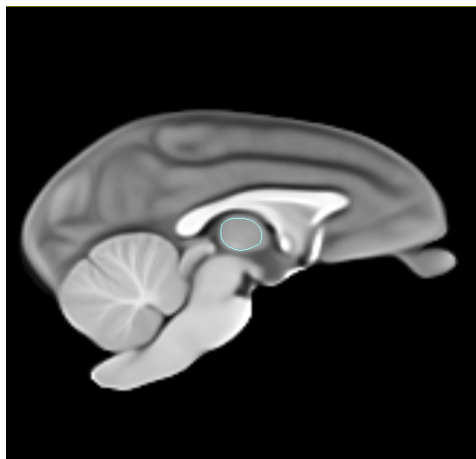
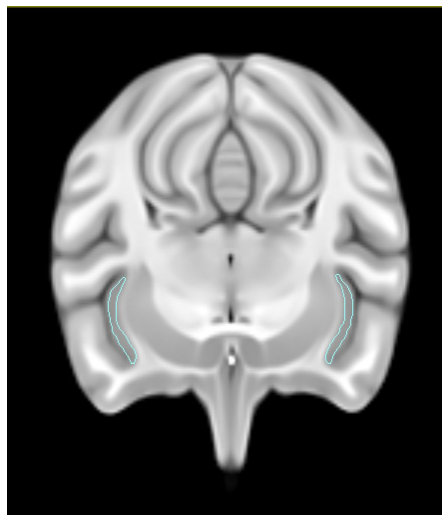
- 1 : area 1 of cortex (somatosensory)
- 2 : area 2 of cortex (somatosensory)
- 23a : area 23a of cortex
- 23b : area 23b of cortex
- 29a-c : area 29a-c of cortex
- 29d : area 29d of cortex**
- 30 : area 30 of cortex
- 31 : area 31 of cortex
- 3a : area 3a of cortex (somatosensory)
- 3b : area 3b of cortex (somatosensory)
- 4 : area 4 of cortex (primary)



ROI Editor → FIJI/ImageJ



# Thalamus, Insula, and Amygdala

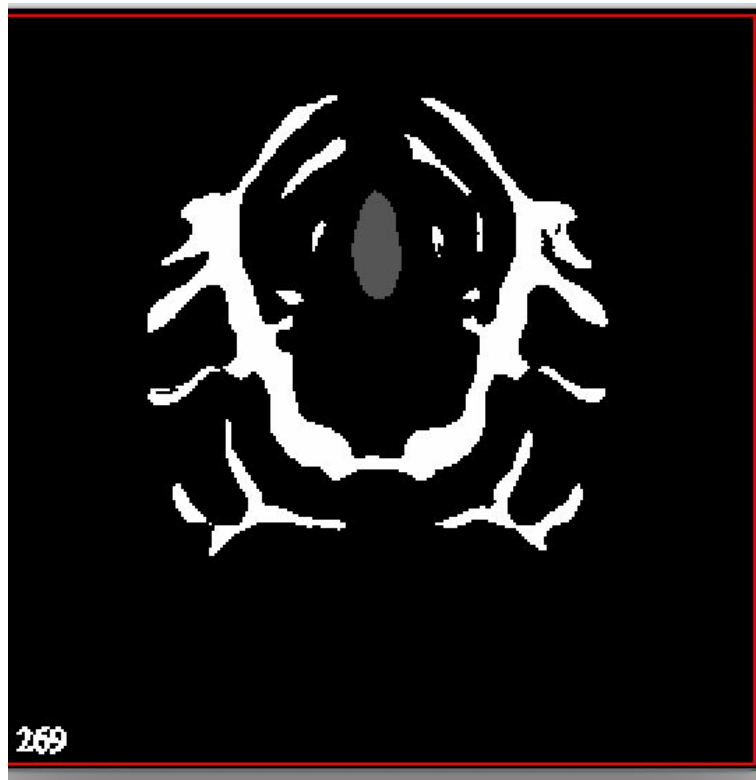


# Combining Regions

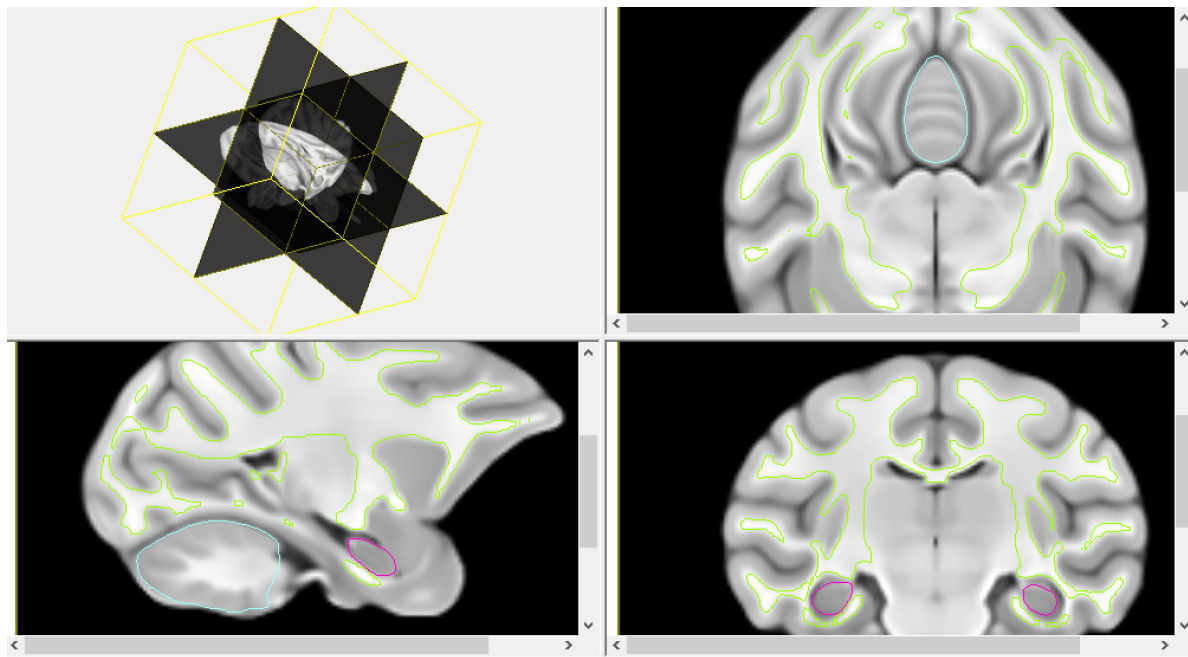
# MATLAB → MIPAV

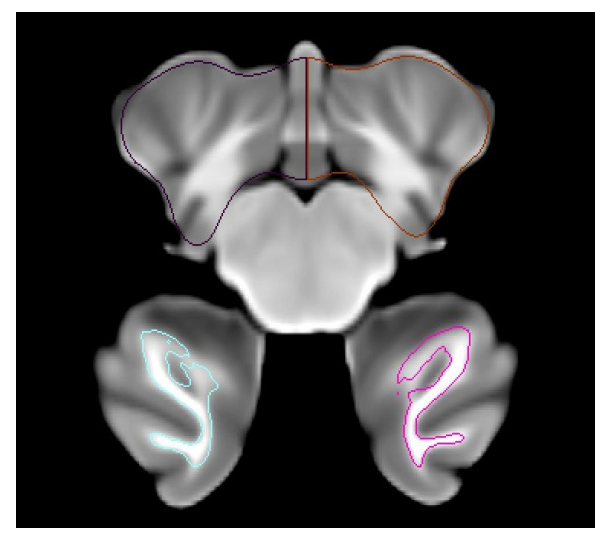
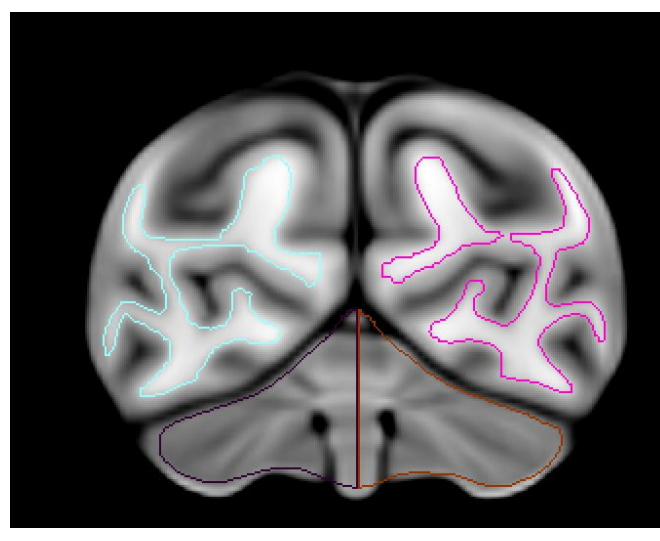
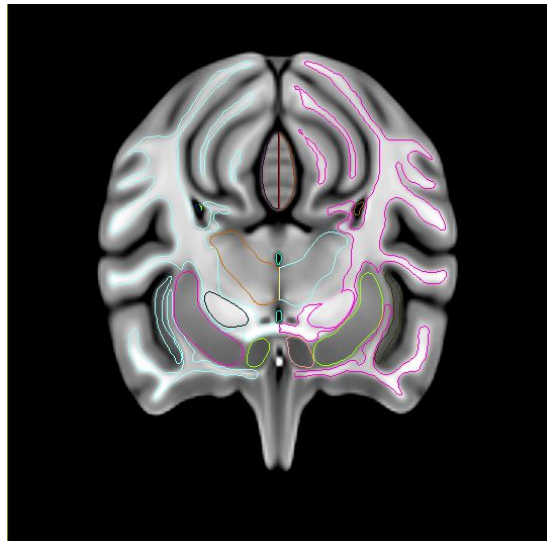
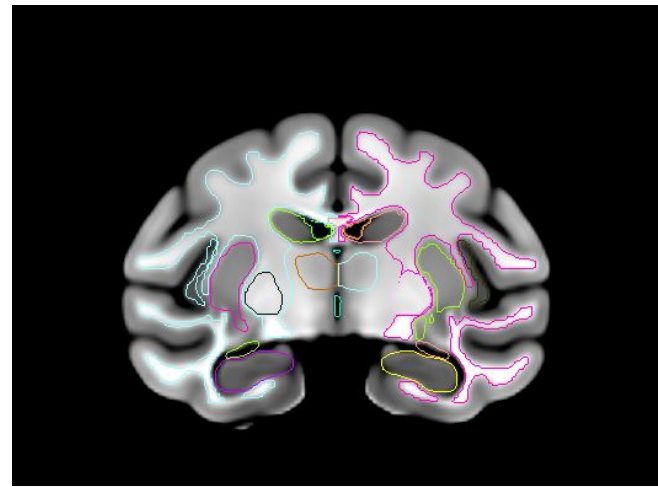
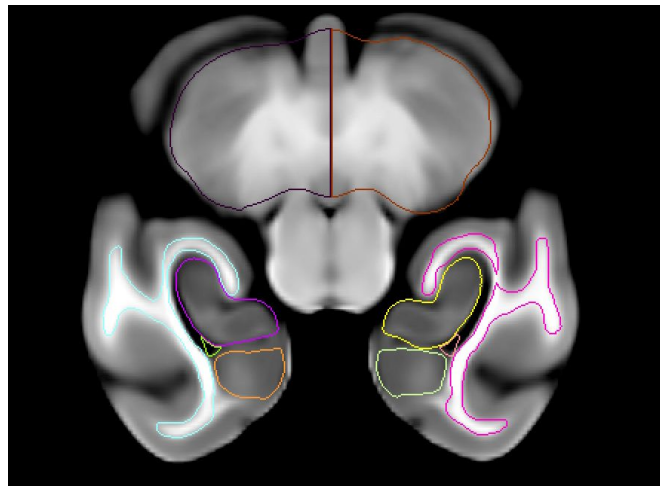
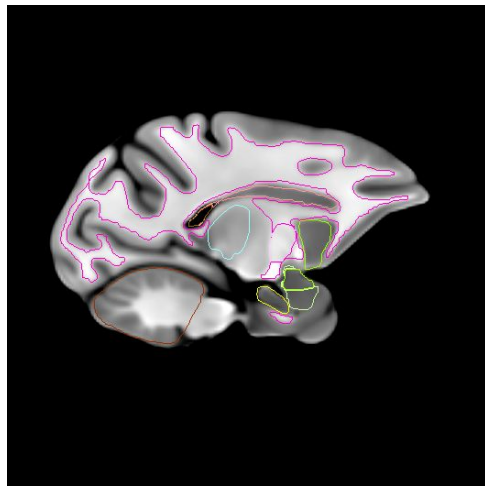
```
%load in roi 1
ROI1 = niftiread('1.nii');
%load in roi 2
ROI2 = niftiread('2.nii');
%load in roi 3
ROI3 = niftiread('3.nii');
%add ROI2 to ROI1
ROI1(ROI2==1) = 2;
%add ROI3 to ROI1
ROI1(ROI3==1) = 3;
niftiwrite(ROI1, 'ROI_Combined.nii');
```

## MIPAV → ROI Editor



# Final Product

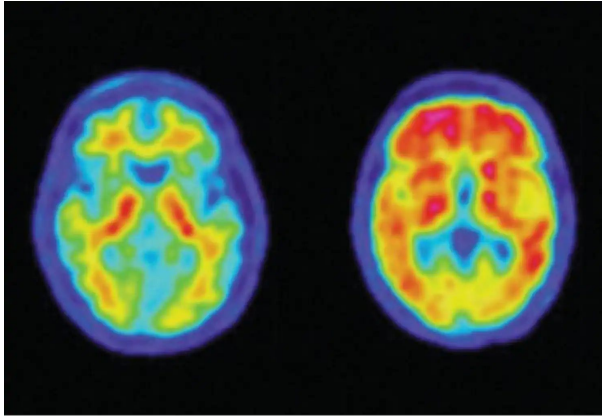




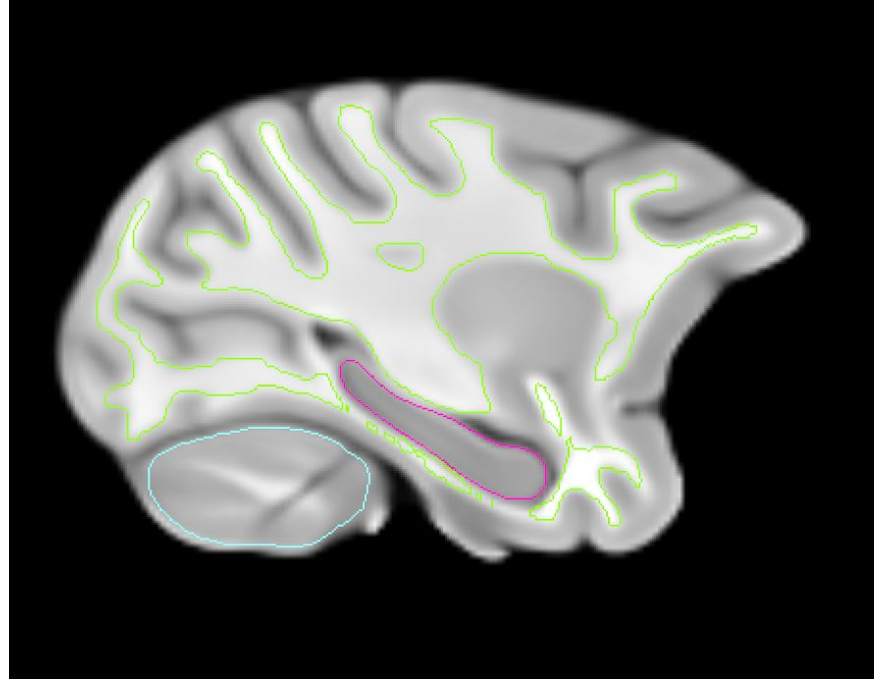


# Applications of Atlas

- PET Imaging
- Progression of Diseases
- Reference

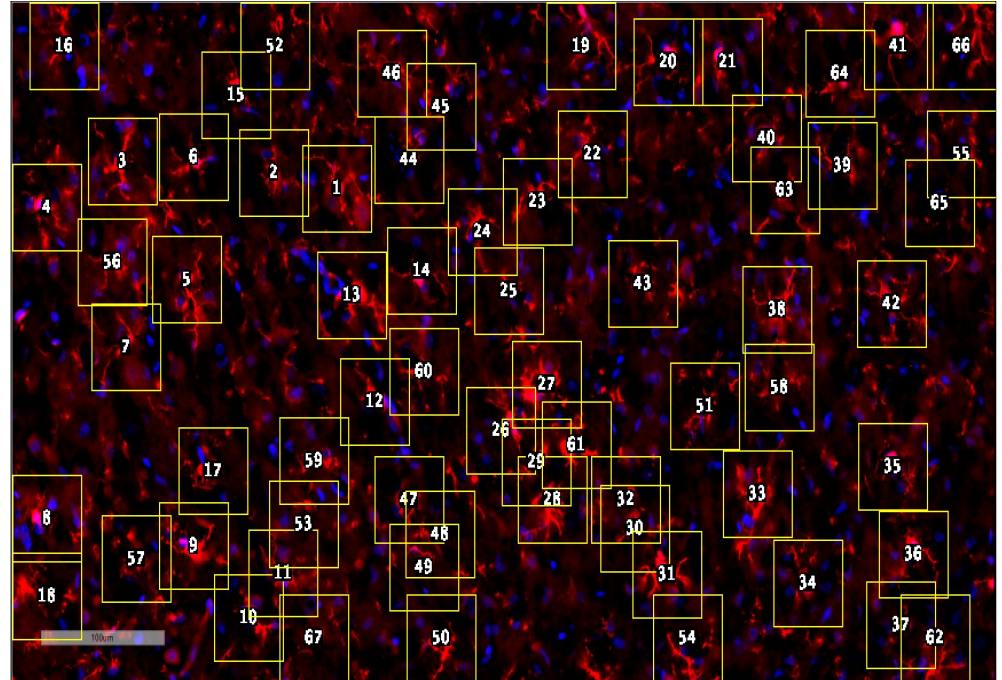
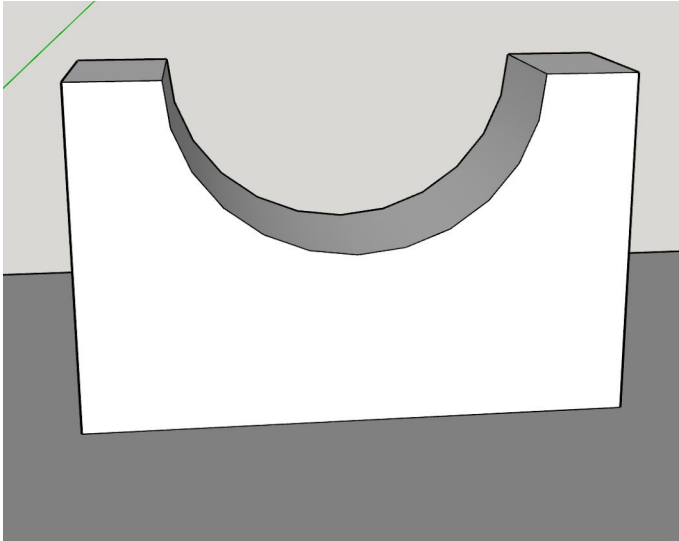


Example of PET scan



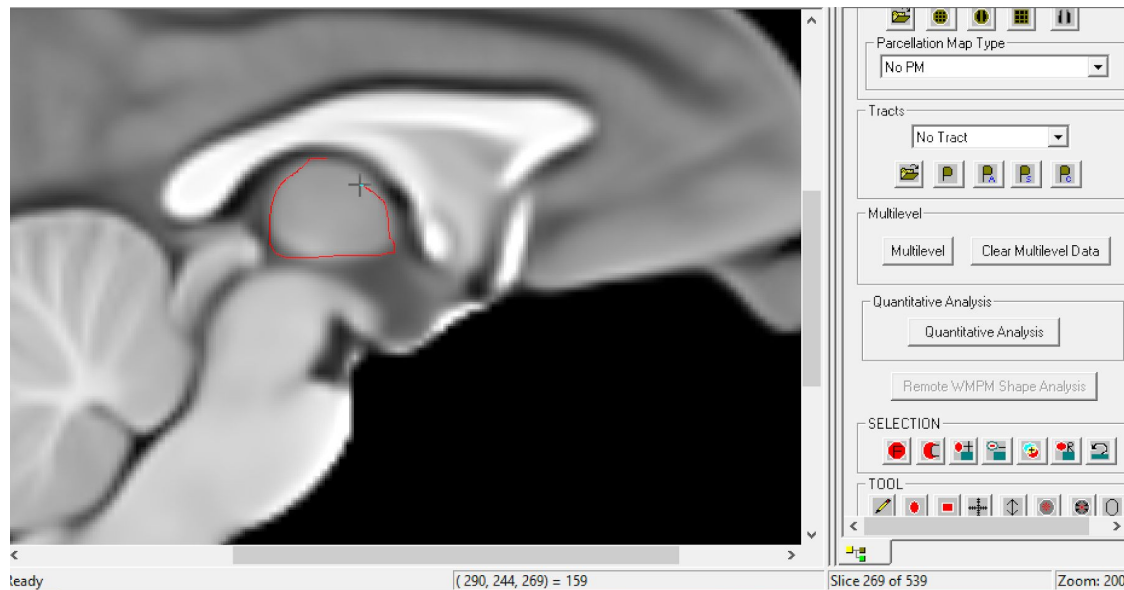
# Other Projects

- 3D printing
- Microglia
- Benchwork



# Mistakes Made and Lessons Learned

- Time and Place for Perfection
- Desktop Organization
- Trial and Error
- How to Save
- Parts of the Brain
- How to 3D print something



# Thank You!



Artur Agaronyan

Dr. William Tu

Dr. Hannah Krug