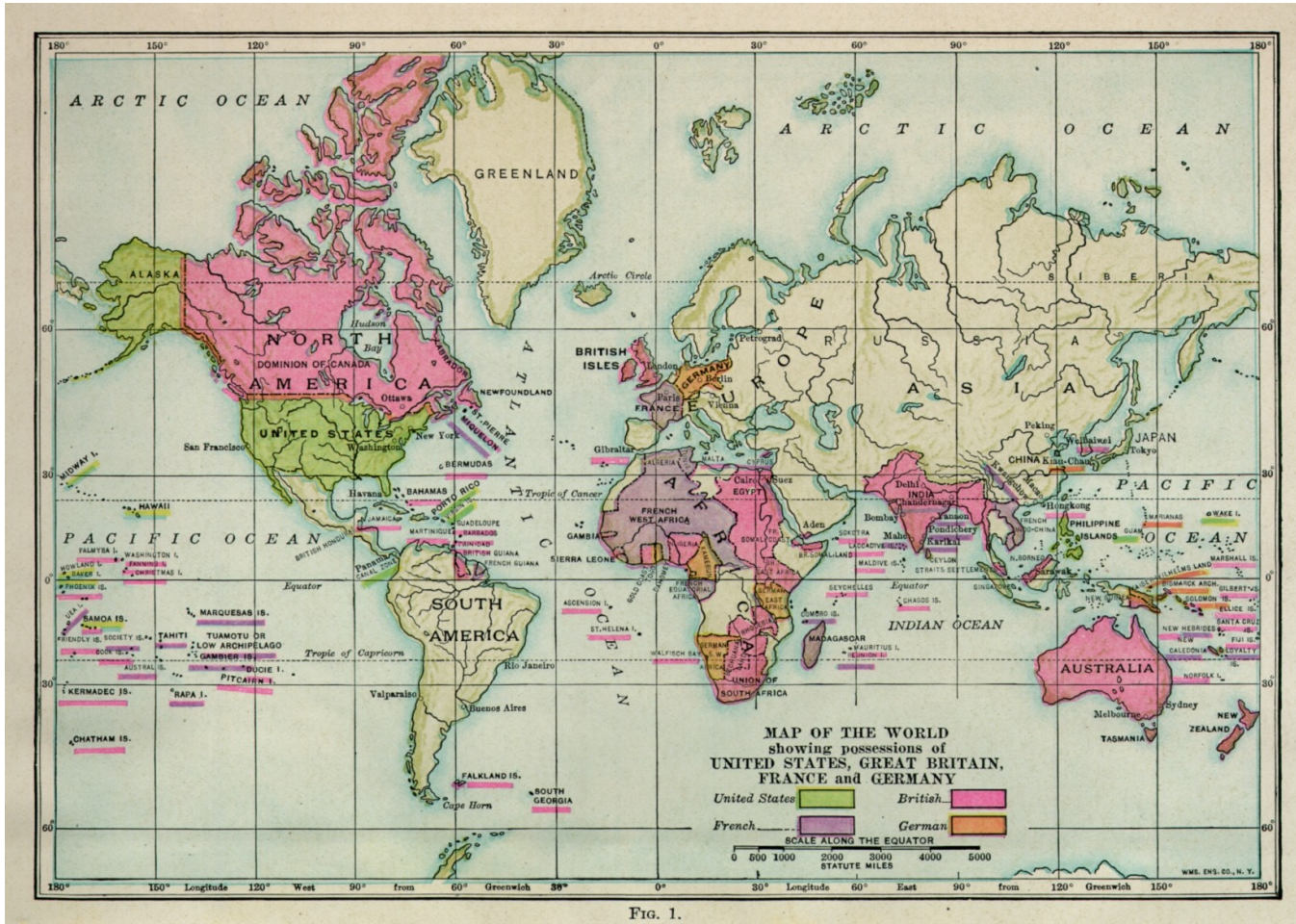


TEMPLATES AND ATLASES



Abbrevs used here

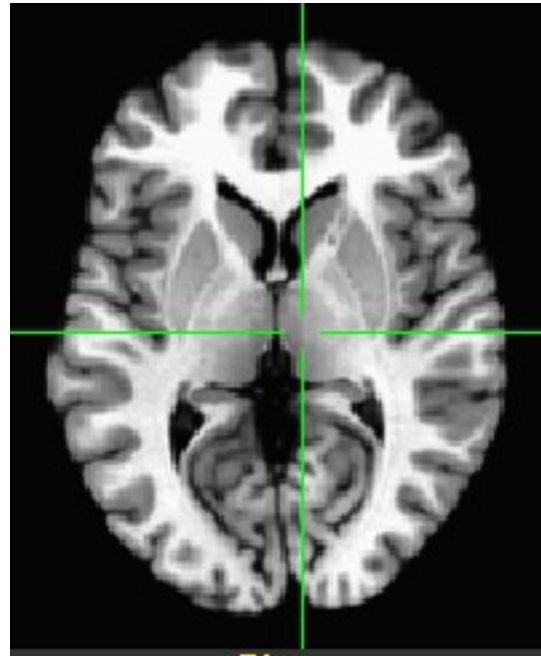
abbrev	= abbreviation
AKA	= also known as
anat	= anatomical
corr	= correlation
diff	= difference
dset	= dataset
e.g.	= exempli gratia (= “for example”)
EPI	= echo planar image
Ex	= example
FOV	= field of view
i.e.	= id est (= “that is”)
ijk	= coordinate indices (integer)
NB	= nota bene (= “note well”)
phys	= physics or physical
ref	= reference
ROI	= region of interest
subj	= subject
vol	= volume
vox	= voxel(s)
xyz	= physical coordinates (units of mm)

Definitions

Template

A reference dataset (typically whole brain) used for matching shapes, reporting coordinates of results, etc.

Ex: TT_N27+tlrc, MNI_EPI+tlrc, TT_ICBM452+tlrc.



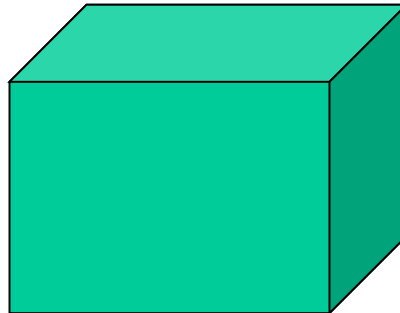
TT_N27+tlrc

Definitions

Template Space

An (x, y, z) coordinate system shared by many datasets in alignment with a template.

Ex: TLRC (Talairach-Tourneaux), MNI, MNI_ANAT, ORIG.



To see what “space” a dset is in, type:

```
3dinfo -space DSET_NAME
```

Definitions

A note on AFNI usage of “tlrc”:

The “+tlrc” extension in a dataset’s name is used to denote that the volume in question is in a standardized space; it does not always mean that the standard space in question is the Talairach-Tournoux one, specifically-- it could be MNI, pediatric template, macaque, ...

Hopefully the context makes things clear.

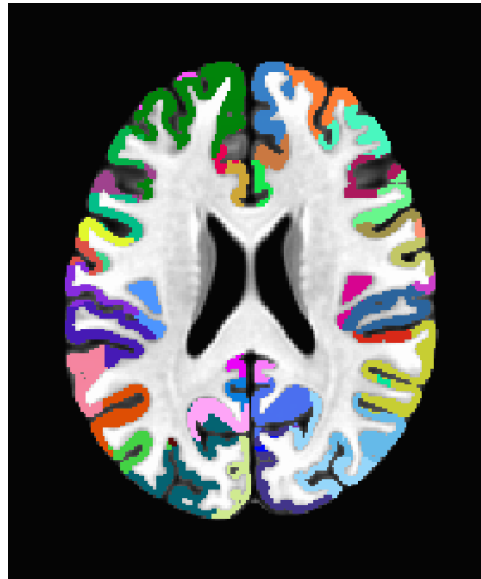
(Typically, there are so many templates for a given space now-- MNI, for example, has several templates-- that one really has to specify the full file name of a template to be able to refer to it unambiguously, anyways.)

Definitions

Atlas

A dset containing segmentation or parcellation information. It can be considered a “map” of ROIs: each ROI is defined as a set of voxels with a certain integer value (and a string label can be attached to each ROI).

Ex: Brodmann_pijn_afni.nii.gz, my_roidset+orig.

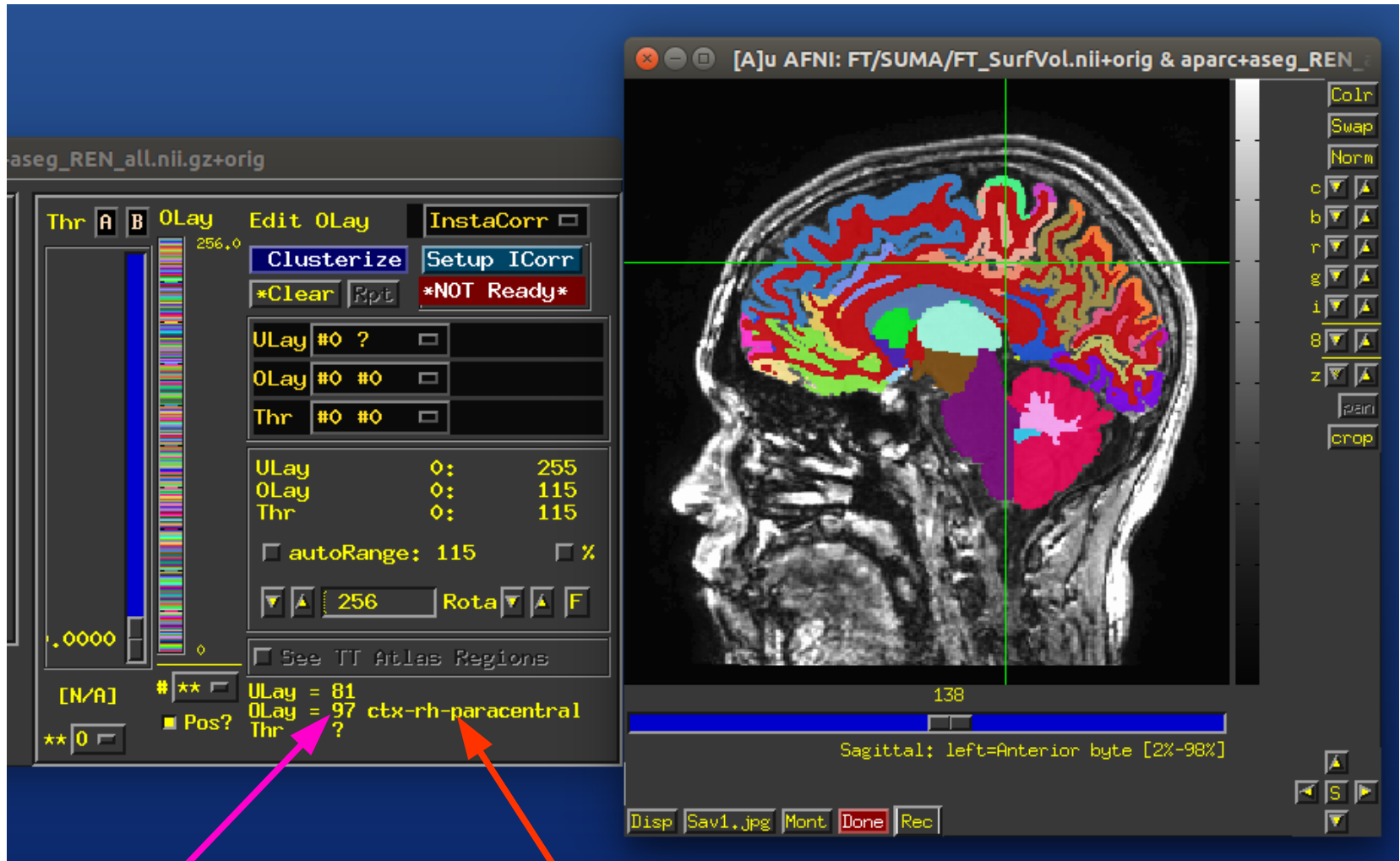


Brodmann_pijn_afni.nii.gz

*See more description about templates+atlases (including making your own) on the AFNI website:
https://afni.nimh.nih.gov/pub/dist/doc/html/doc/template_atlas/framework.html*

Definitions

Atlas (or general ROI) label in GUI



integer value of ROI

associated string label

Templates included with AFNI

After default AFNI installation, these templates (and others) would be in ~/abn/:



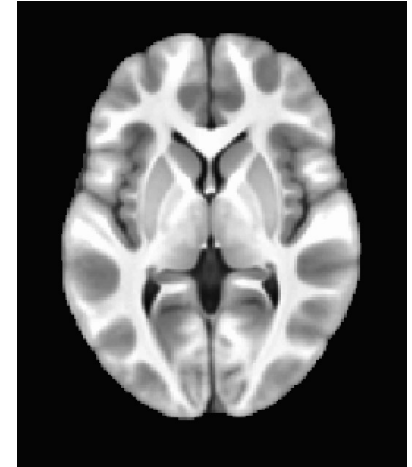
TT_N27



MNI_CAEZ_N27



MNI152_T1_2009c



Haskins_Peds

What important properties does each dset here have?

Choosing a template

Try to pick a template that...

- is similar to the subject group: neonates, pediatric, young adults, elderly, macaque, rabbit...
- is of the same modality and coverage as your data sets
- has a relevant atlas segmentation

Choosing a template

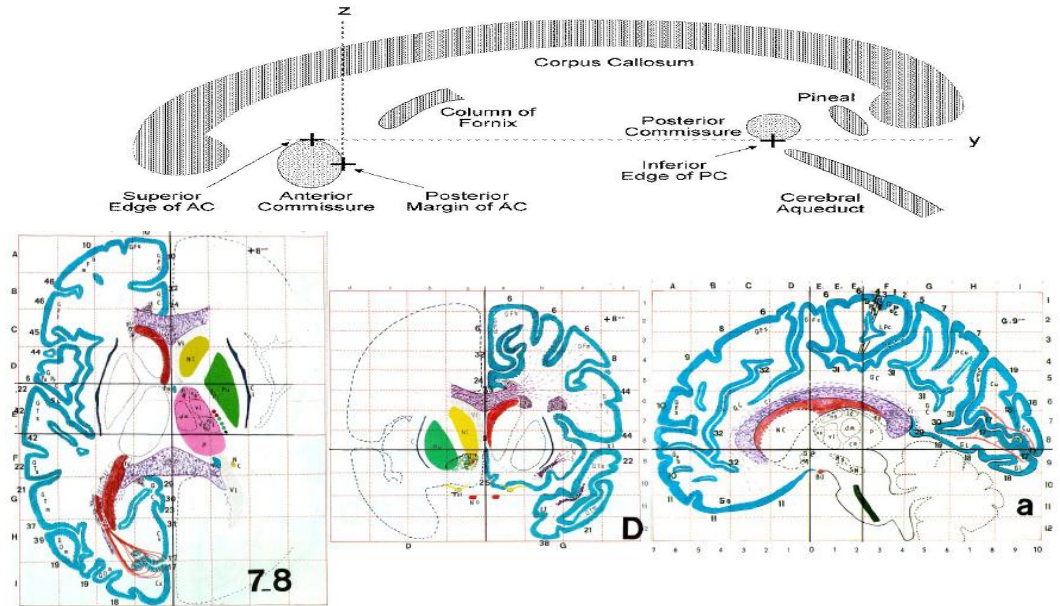
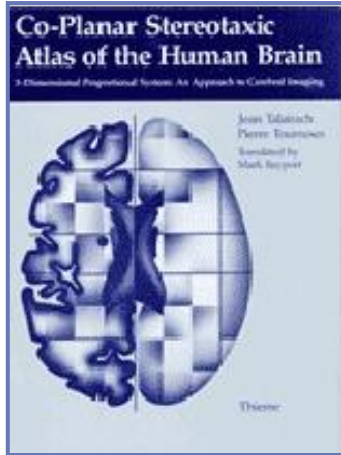
Try to pick a template that...

- is similar to the subject group: neonates, pediatric, young adults, elderly, macaque, rabbit...
- is of the same modality and coverage as your data sets
- has a relevant atlas segmentation.

You can also make your own template (and maybe an atlas too):

- Individual or group template
 - Group: average or iterative (discussed more later)
- Scripts/commands exist in AFNI
 - Ex. Haskins pediatric atlas
 - several methods tested
 - best approach: *iterative nonlinear alignment*
 - @toMNI_Awarp, @toMNI_Qwarpar
 - And soonish `make_template_dask.py`

Talairach Templates, Procedures



Jean Talairach and Pierre Tournoux
“Co-Planar Stereotaxic Atlas of the Human Brain”
Thieme Medical Publishers, New York, 1988



The Many Faces of MNI Templates



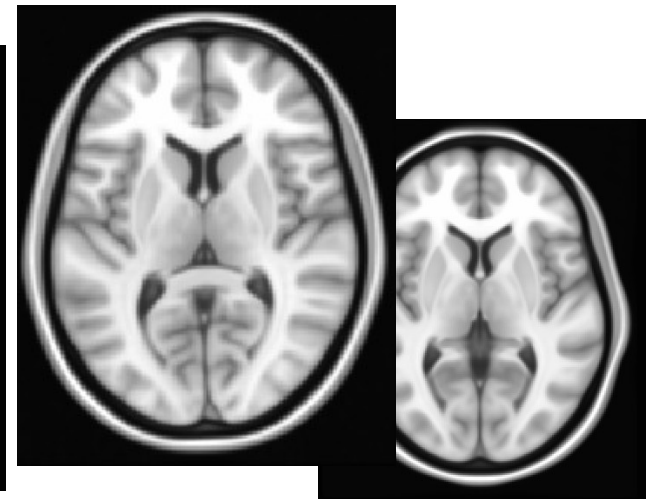
MNI_305 - the first MNI template, (“sort of Talairach AC-PC”) 1992



MNI N27
MNI_caez_N27, “Colin brain”, 1998



MNI_152 (2mm)
MNI cohort of ICBM452, 2001



MNI_2006 asym MNI_2006 sym
“6th generation” (MNI) (FSL,SPM)

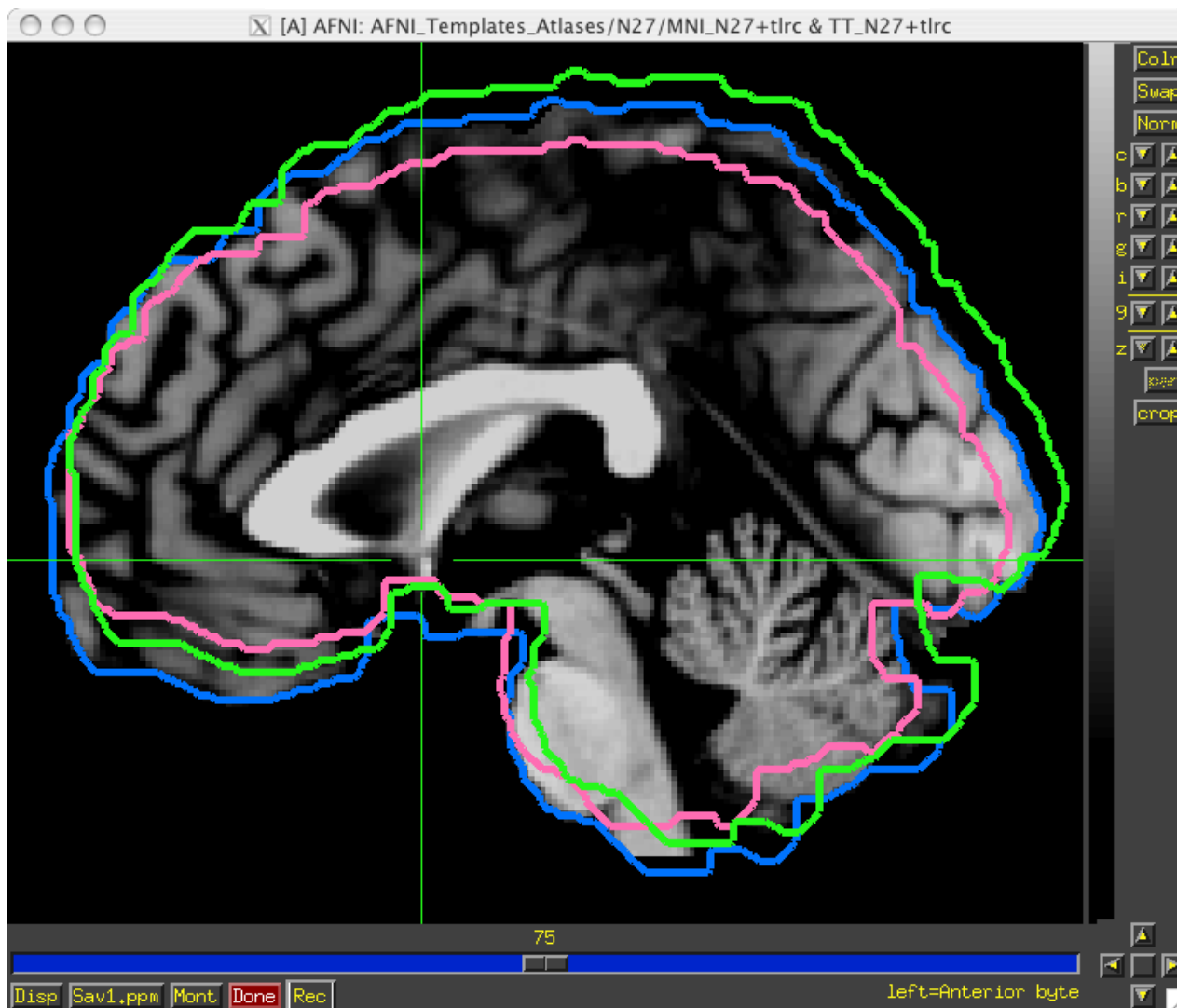


MNI_2009c
asymmetric.
Unifized in AFNI.
a,b,c versions,
symmetric/asymmetric
c, different grids
1mm,0.5mm, 2011

+Other MNIs:
MNI_ANAT (SPM
Anatomy Toolbox),
HCP40, HCP900,
Mai-MNI,....

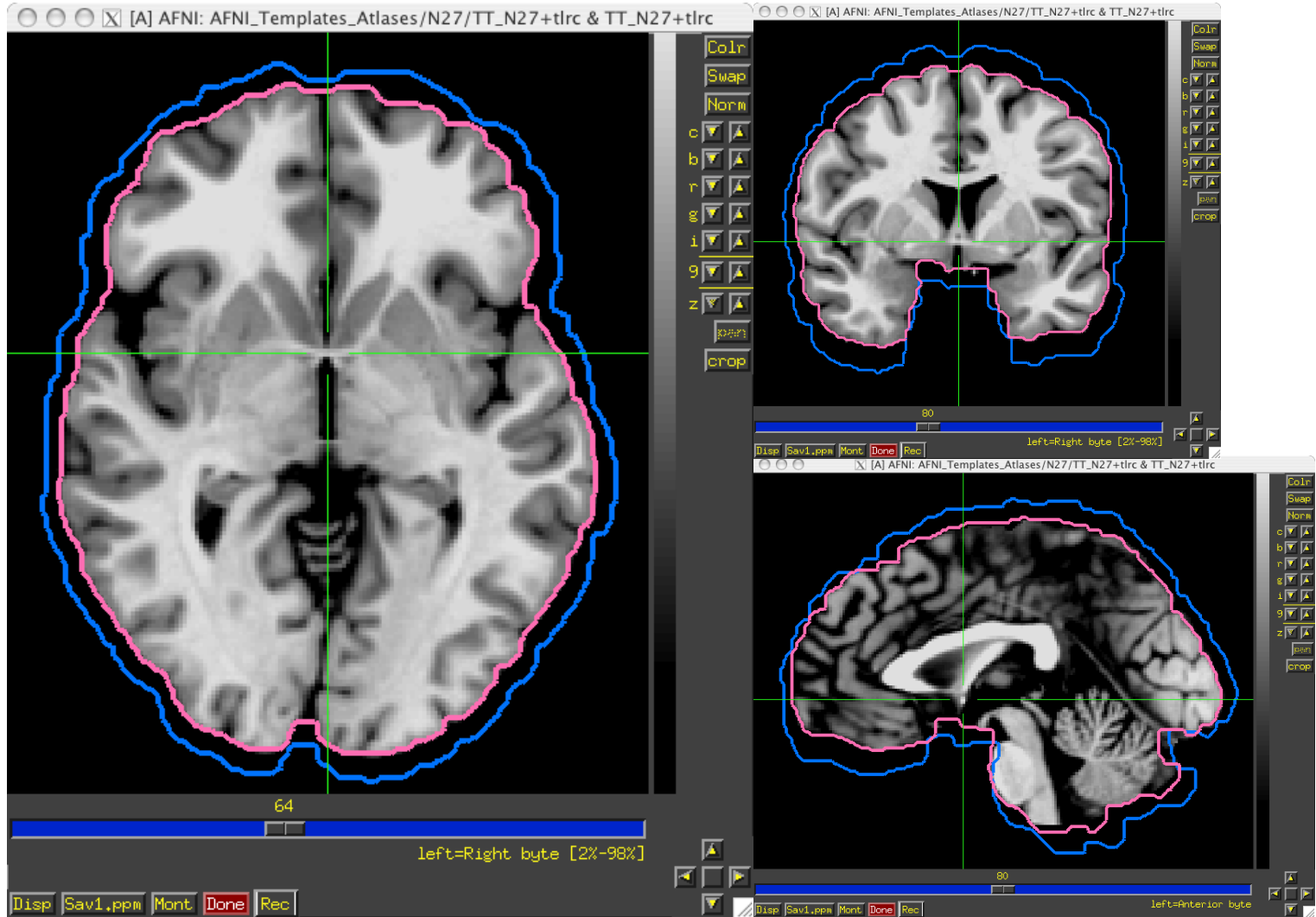
Template spaces differ in origin

TLRC, MNI, and MNI-Anat



Template spaces differ in size

The **MNI** brain is larger than the **TLRC** brain.



From space to space

For going between TLRC and MNI:

Approximate equation

→ used by **whereami** and **3dWarp**

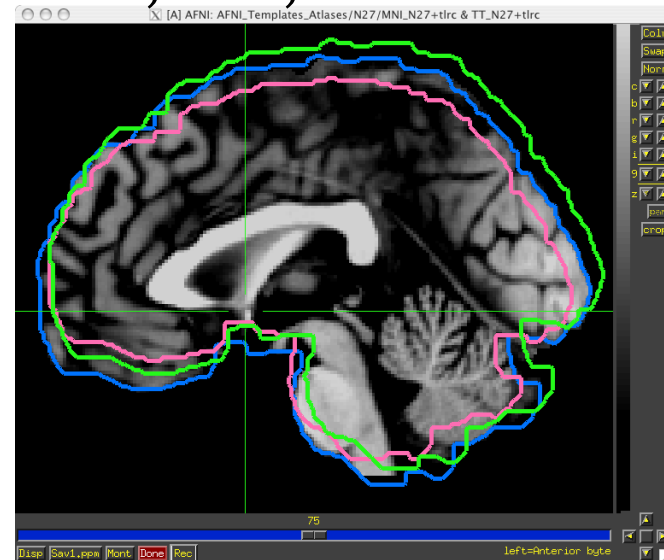
A manual TLRC transformation of MNI template to TLRC space

→ used by **whereami** (as precursor to MNI Anat.), based on N27 template

Multiple space coordinates reported in **whereami** output

(**AFNI_ATLAS_TEMPLATE_SPACE_LIST**)

TLRC, MNI, and MNI-Anat



For going between MNI and MNI Anat (Eickhoff et al., 2005):

$MNI + (0, 4, 5) = MNI\ Anat.$ (in RAI coordinate system)

Going between TLRC and MNI Anat (as practiced in whereami):

Go from TLRC (TT_N27) to MNI via manual transform of N27 template

Add (0, 4, 5)

Finding your space

```
3dinfo -space -prefix *.HEAD *.nii.gz
HaskinsPeds HaskinsPeds_NL_atlas1.01
HaskinsPeds HaskinsPeds_NL_template1.0
MNI_N27 MNI_caez_N27
MNI_N27 MNI_caez_gw_18
MNI_N27 MNI_caez_lr_18
MNI_N27 MNI_caez_ml_18
MNI_N27 MNI_caez_mpm_22
TT_N27 TT_N27
TT_N27 TT_caez_gw_18
TT_N27 TT_caez_lr_18
TT_N27 TT_caez_ml_18
TT_N27 TT_caez_mpm_22
MNI BN_Atlas_246_1mm.nii.gz
MNI_N27 Brodmann.nii.gz
MNI_2009c_asym Brodmann_pijn_afni.nii.gz
MNI_2009c_asym FS.afni.MNI2009c_asym.nii.gz
TT_N27 FS.afni.TTN27.nii.gz
HaskinsPeds HaskinsPeds_NL_template1.0_SSW.nii.gz
MNI_2009c_asym Julich_MNI2009c.nii.gz
MNI_N27 Julich_MNI_N27.nii.gz
MNI_2009c_asym MNI152_2009_template.nii.gz
MNI_2009c_asym MNI152_2009_template_SSW.nii.gz
MNI_2009c_asym MNI_Glasser_HCP_v1.0.nii.gz
```


Templates included with AFNI

A helpful note on viewing templates (or any dsets) each time you open up the AFNI GUI, regardless of directory!

Set the **AFNI_GLOBAL_SESSION** variable in your `~/.afnirc` file, e.g.,:

```
AFNI_GLOBAL_SESSION = /home/nmandela/abin
```

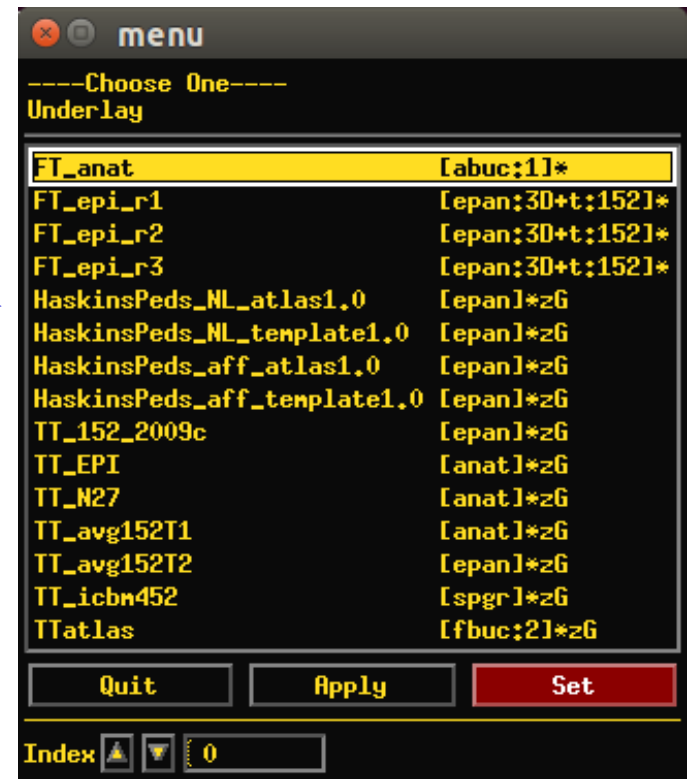
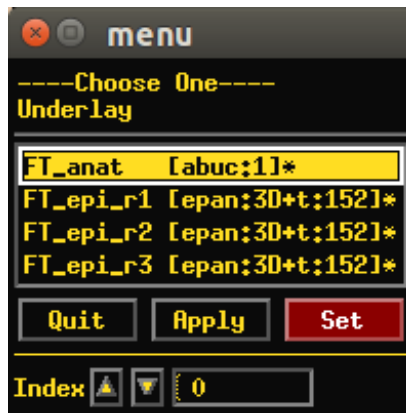
All dsets there will appear in your “Underlay” or “Overlay” menu in the AFNI GUI. (Use full path of directory, no “~” or “\$HOME”.)

Ex: then open AFNI GUI in some directory, say:

```
~/AFNI_data6/FT_analysis/FT/
```

after →

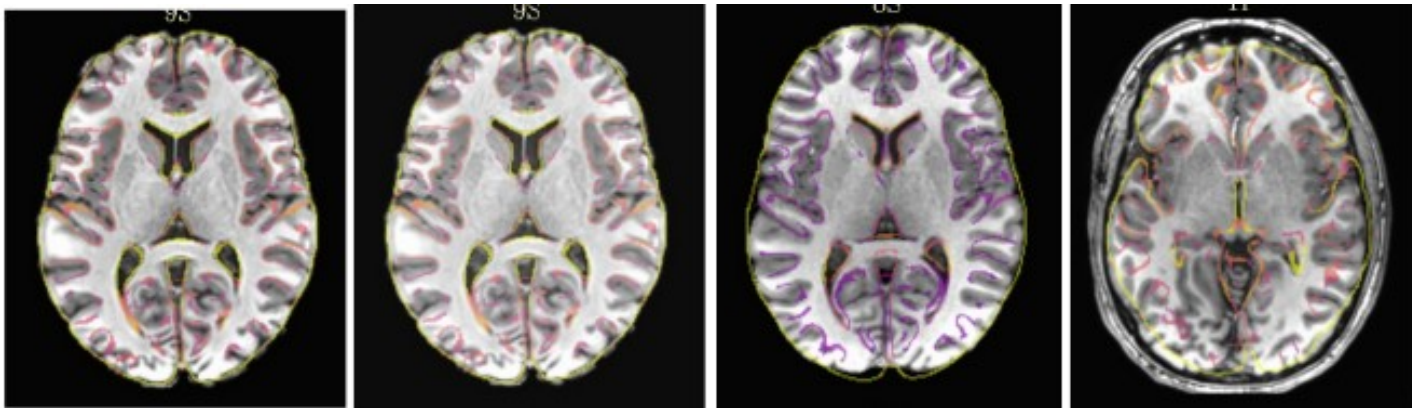
before →



Trading Spaces

How to transform data to a standard template space

- `sswarper2` - skullstrip and align data to some select standard spaces
- `@animal_warper` - skullstrip, align data to animal template and bring atlas into native space
- `auto_warp.py` - combination affine and nonlinear alignment to a template
- `@auto_tlrc` - affine alignment to a template
- Manual talairach



sswarper2/
@SSw

AW

@at

manual

Trading Spaces with afni_proc.py

```
-blocks ... tlrc volreg  
-volreg_tlrc_warp  
-tlrc_base $tpath/$btemplate (runs @auto_tlrc)  
-tlrc_NL_warp (runs auto_warp.py)
```

For sswarper2 output, add these:

```
-copy_anat anatSS.${subj}.nii \\  
-anat_has_skull no \\  
-tlrc_NL_warp \\  
-tlrc_NL_warped_dsets \\  
    anatQQ.${subj}.nii \\  
    anatQQ.${subj}.aff12.1D \\  
    anatQQ.${subj}_WARP.nii
```

Standard spaces

Reasons to use a standard template space:

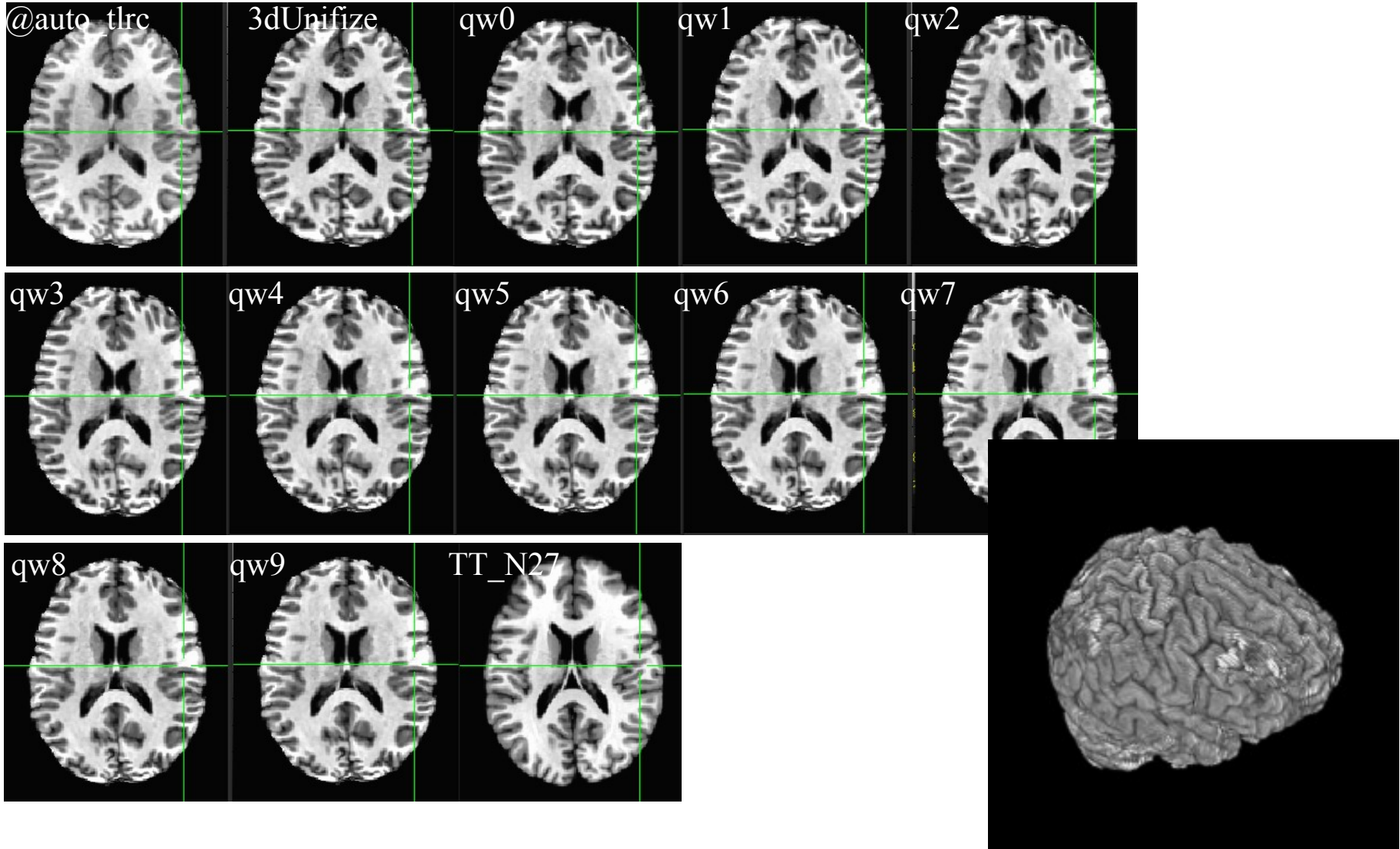
- Compare across subjects and groups easily for every voxel in the brain
- Standardize coordinates with others
- Know where a voxel is automatically from an atlas
- Mostly automated and no specific ROI drawing required

Reasons not to use a standard template space:

- Inconsistency among subjects
- Inconsistency among groups - elderly versus younger
- Use consistent anatomical ROIs with good anatomical knowledge
- Lower threshold for multiple comparison adjustments
- Methods like DTI require much of the processing to be done in subject space
- Surface analysis
- Surgical, subject-specific coordinates for TMS, DBS (but can still use template alignment to move atlases to subject space)

Nonlinear alignment to template

3dQwarp, through multiple levels of refinement →



Nonlinear alignment to template

Multiple nonlinear alignment tools in AFNI

3dQwarp: the standard nonlinear workhorse

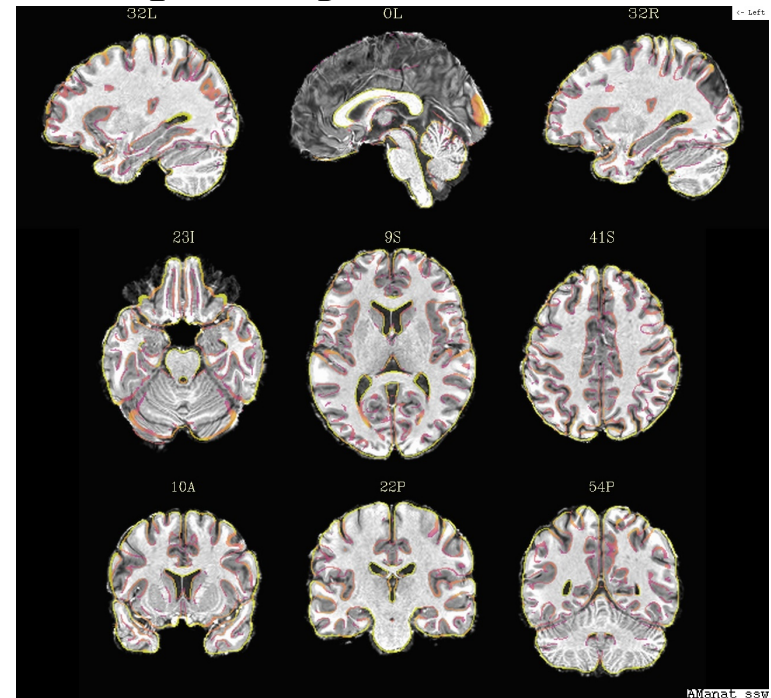
auto_warp.py: wrapper for alignment functionality, ~simpler syntax
(@auto_tlrc + 3dQwarp together)

```
Ex: auto_warp.py -base MNI152_T1_2009c+tlrc. \
      -suffix _awarp -input strip+orig.
```

sswarper2: skull stripping and alignment in one-- and bonus automatic QC images →

+ sswarper2 uses a multi-volume base; several exist for standard templates already, and more can be made-- see full description for these online:

https://afni.nimh.nih.gov/pub/dist/doc/html/doc/template_atlas/sswarper_base.html



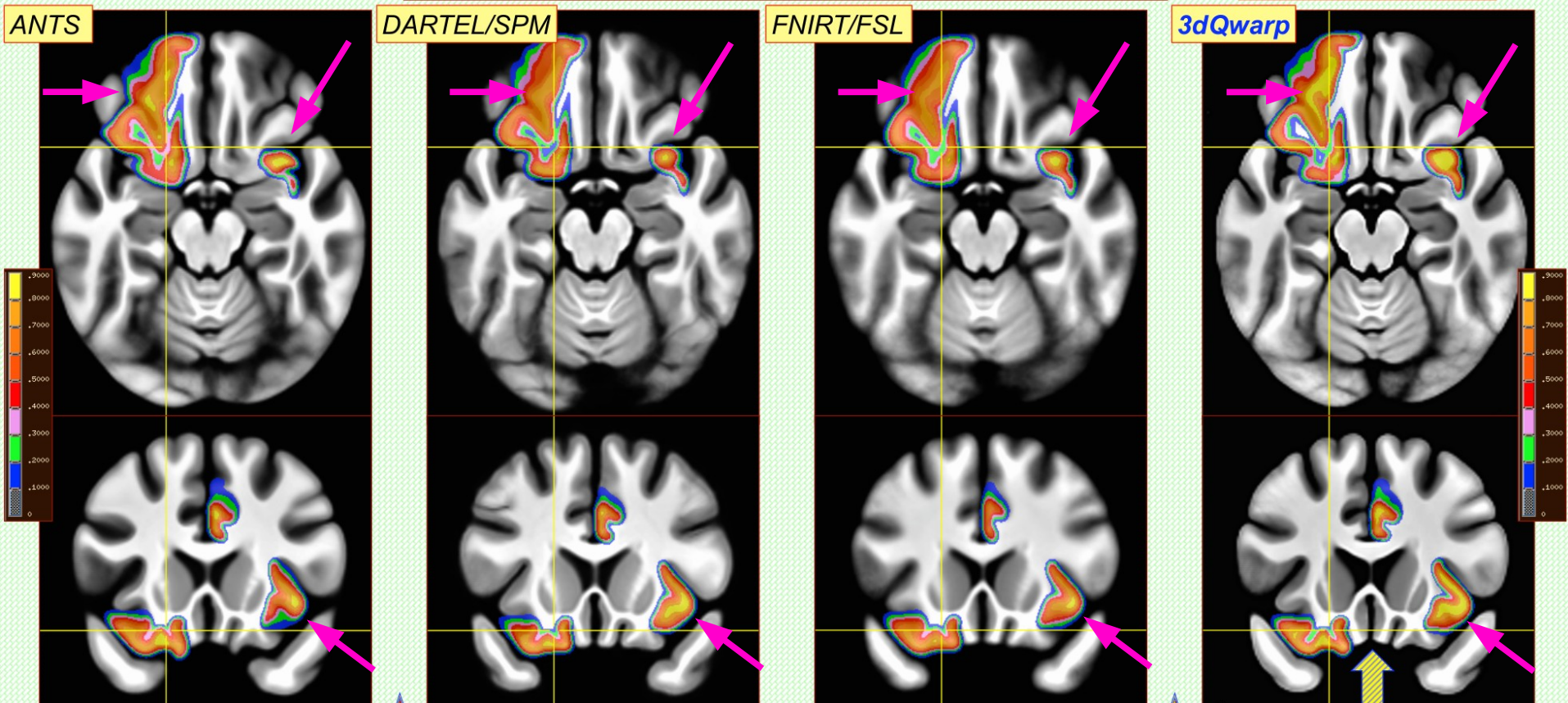
Measuring quality of alignment

Can compare 3dQwarp with other available nonlinear alignment tools

- + For a group of subjects, estimate warp from anat to template
- + Apply warp to labeled ROIs, and measure % overlap in results. (Yellow: >90% overlap)

Align MindBoggle 101 T₁ Datasets to Separate Template:
Overlap Probability Maps for 3 of the Labeled Regions

LH: lateral orbital frontal
RH: caudal anterior cingulate
RH: insula



ANTS, DARTEL and FNIRT run with default settings

(Cox & Glen, 2013, OHBM)

2023 Atlas Overhaul

a new dawn, a new day

Cleaning Up:

Removal of TTatlas+tlrc - Talairach daemon

Removal of other older SPM Anatomy Toolbox atlases, no MNI_ANAT atlases

Adding On:

Addition of Brodmann-Pijnenburg atlases MNI_N27 and MNI_2009d

Addition of JulichBrain atlases for MNI_N27 and MNI_2009c

Addition of FreeSurfer atlases for TT_N27 and MNI_2009c

Making Changes:

Default Atlas for “Show atlas colors”, “Go to atlas location” is
Brodmann_Pijn_AFNI (MNI_2009c)

Atlases identified with specific template spaces for MNI - MNI_N27, MNI_2009c.

Atlas versions and description in AFNI header and in NIFTI header

Default atlas search updated

Default template space list for coordinates shown is TLRC, MNI (no MNI_ANAT)

Going where the atlases live

AFNI binary directory for datasets and configuration

AFNI_atlas_spaces.niml describe the distributed atlases

CustomAtlases.niml and SessionAtlases.niml allow for more atlases and templates

Saving the Environment (in .afnirc)

```
AFNI_ATLAS_LIST "CA_ML_18_MNI,DKD_Desai_MPM"  
"ALL"
```

```
AFNI_TEMPLATE_SPACE_LIST "MNI,TLRC"
```

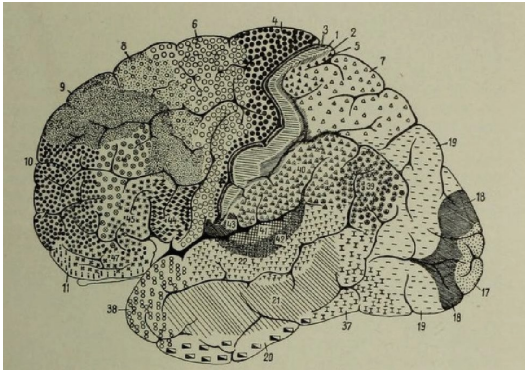
```
AFNI_ATLAS_COLORS CA_ML_18_MNI
```

```
AFNI_SUPP_ATLAS_DIR ~/MyAtlases
```

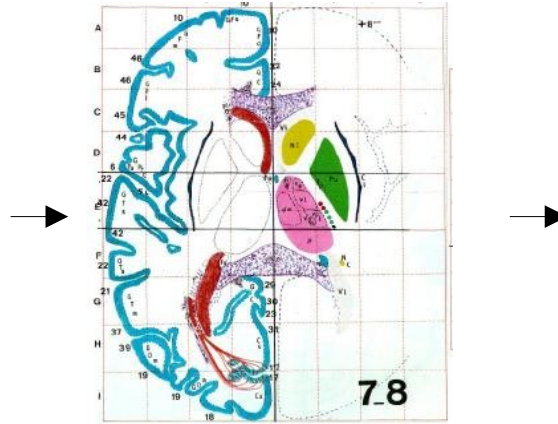
```
AFNI_WHEREAMI_DEC_PLACES 2
```

```
AFNI_WHEREAMI_MAX_SEARCH_RAD 3
```

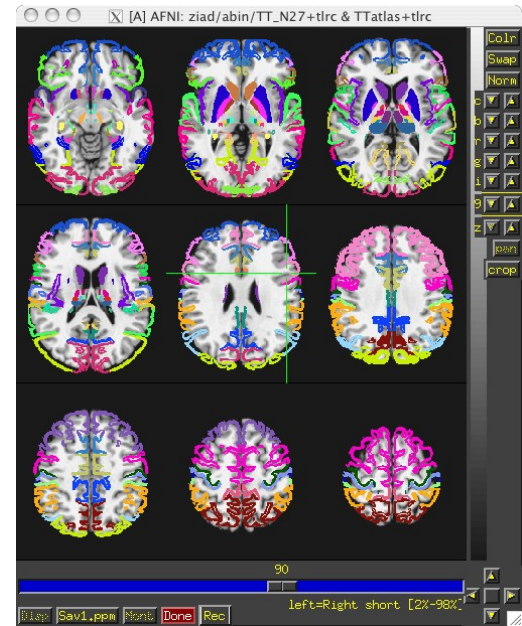
Early Atlases - Talairach Daemon



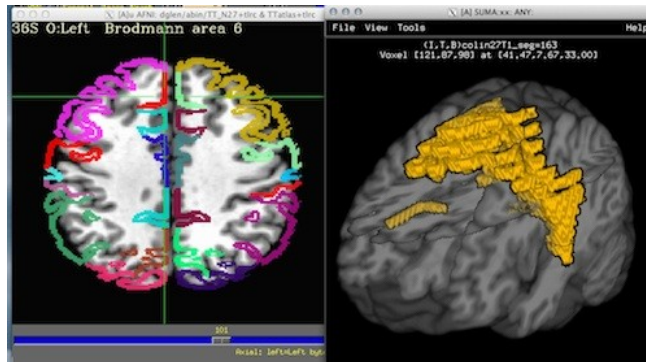
Brodmann, 1909



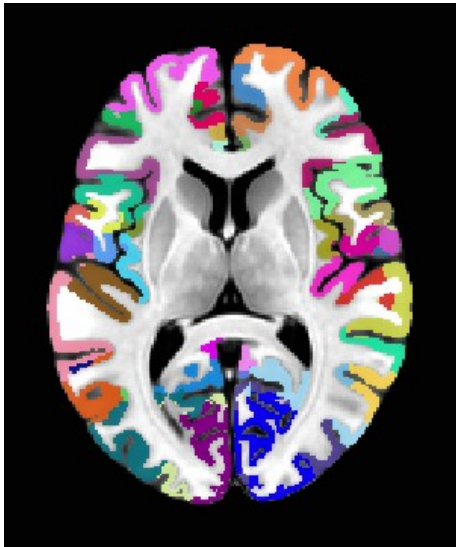
Talairach, 1988
Half brain- 5mm slices
No MRI volume



Lancaster, 2000



Removed from
AFNI, 2023?

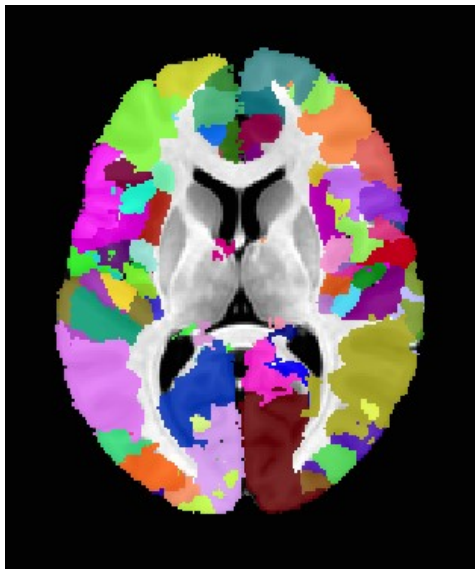


Brodmann-Pijnenburg

“Classical atlases” - Heuvel group

MNI_N27

MNI_2009c (AFNI reprojection)



JulichBrain 3.0

(replacing Eickhoff-Zilles atlases)

157 region MPM (probabilistic
available from EBRAINS)

MNI_N27

MNI_2009c

(AFNI working with EBRAINS and
Julich groups for updates)



Eickhoff-Zilles Macrolabel (AAL)

MNI_N27 (shifted)

TT_N27 (transformed)

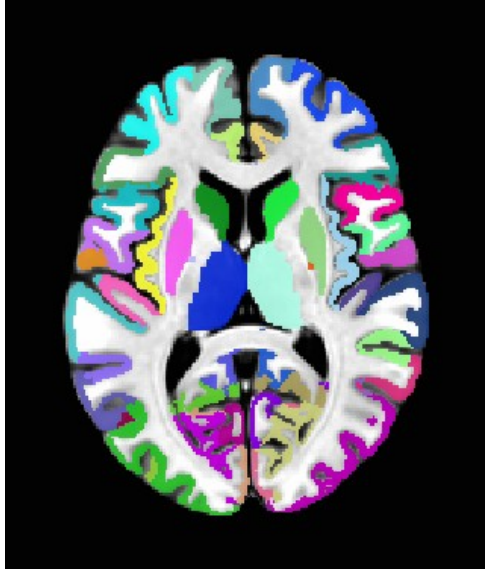


Eickhoff-Zilles MPM 2.2

MNI_N27 (shifted)

TT_N27 (transformed)

10 subject probabilistic atlases also available

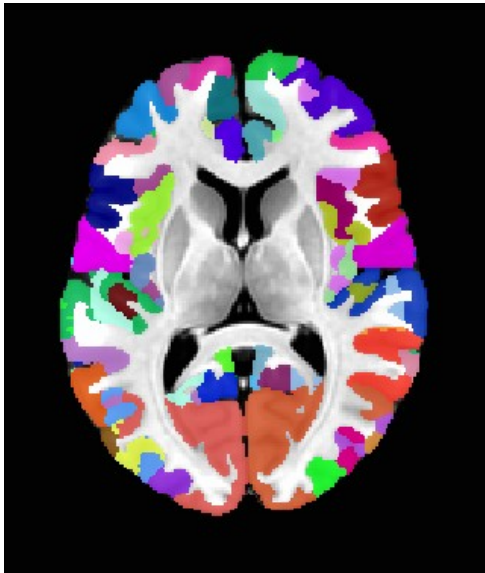


Freesurfer recon-all

Destrieux Gray matter regions

TT_N27

MNI_2009c



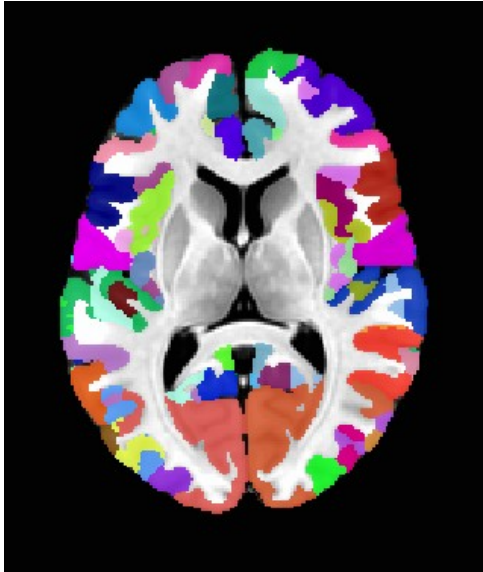
HCP Glasser

360 region - FMRI task-based

MNI_2009c - AFNI projection with

Megan Robinson, Michael

Beauchamp - Baylor

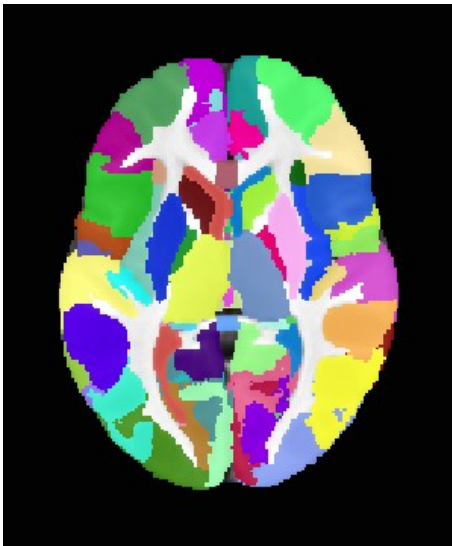


Brainnetome

DTI-based, L. Fan, T. Jiang

HCP-40 (~MNI_2009c)

246 regions



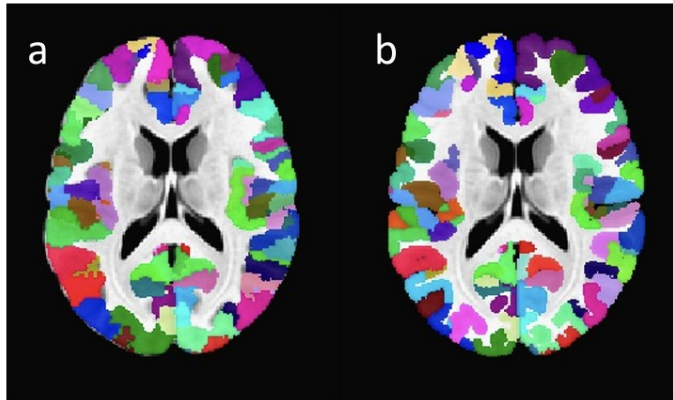
Haskins Pediatric

MNI_2009c

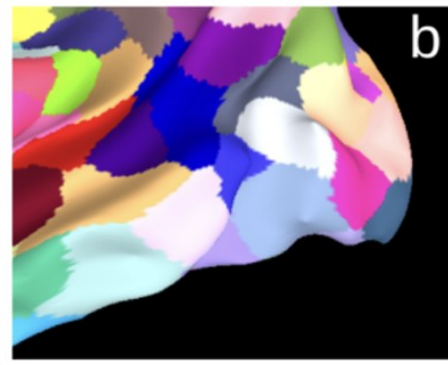
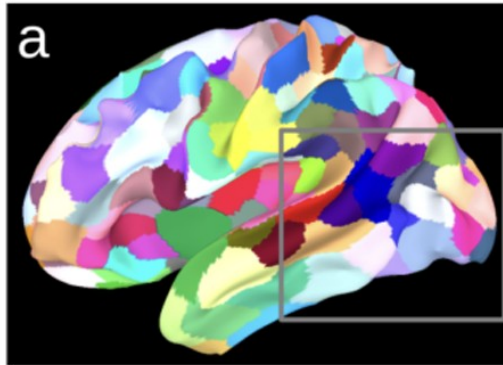
75-subject 10 year old median age
(6-13 years)

AFNI-Haskins, P. Molfese

Schaefer-Yeo atlases -available on AFNI website



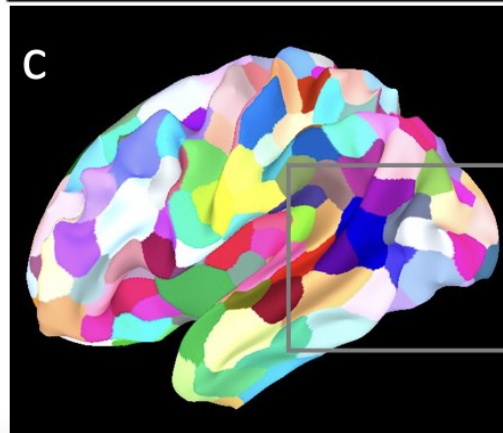
Resting state based regions of similar sizes labeled by overlap with 7 or 17 resting state networks and anatomical regions.



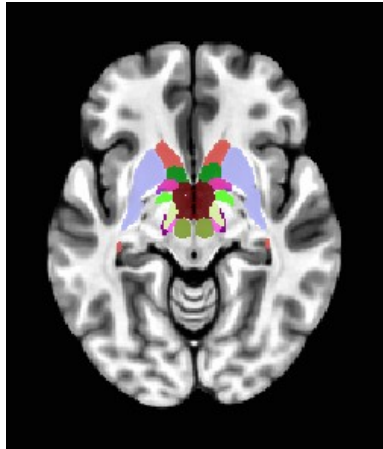
100 - 1000 regions per atlas

AFNI version

Modally smoothed on surface and projected into MNI_2009c volume



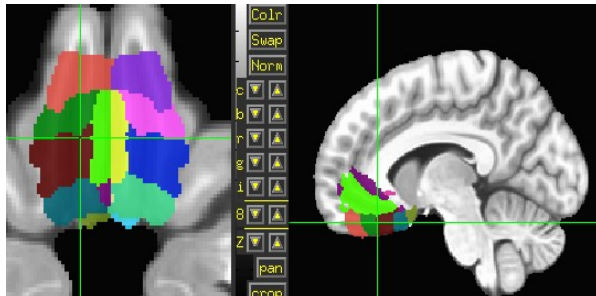
400 region 17-network atlas shown here



Pauli subcortical atlas

MPM atlas

AFNI version MNI_2009c space



Ventromedial Prefrontal Cortex (vmPFC, Scott Mackey)

MPM atlas

AFNI version MNI_2009c

Using atlases in AFNI GUI

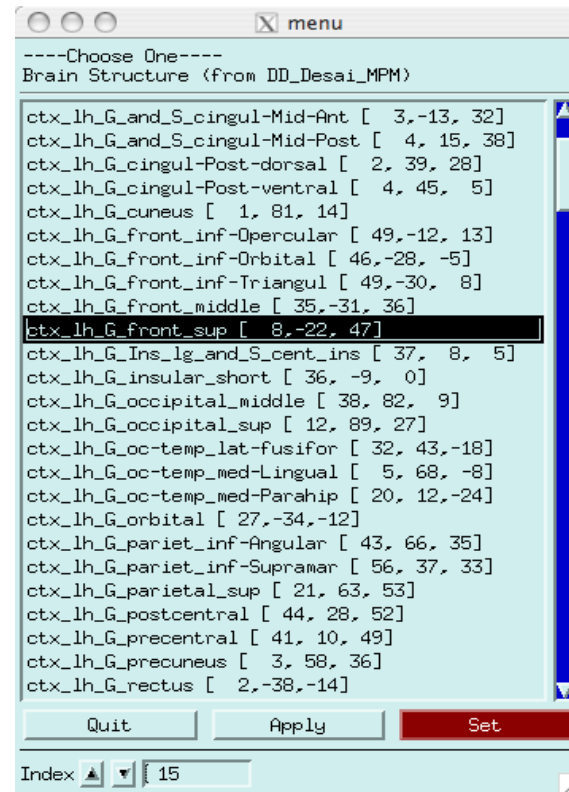
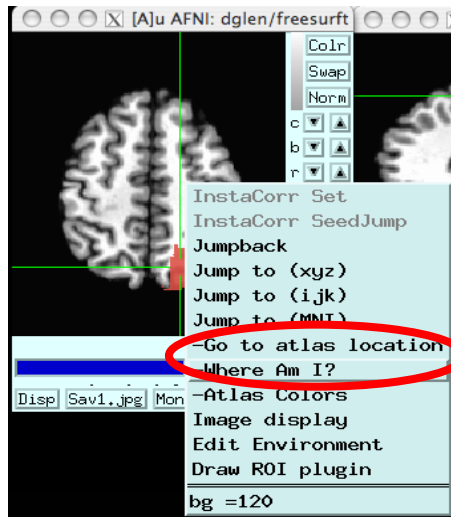
- Some fun and useful things to do with `+tlrc` datasets are on the 2D slice viewer.

Ex: can be run in `~/AFNI_data6/afni/`

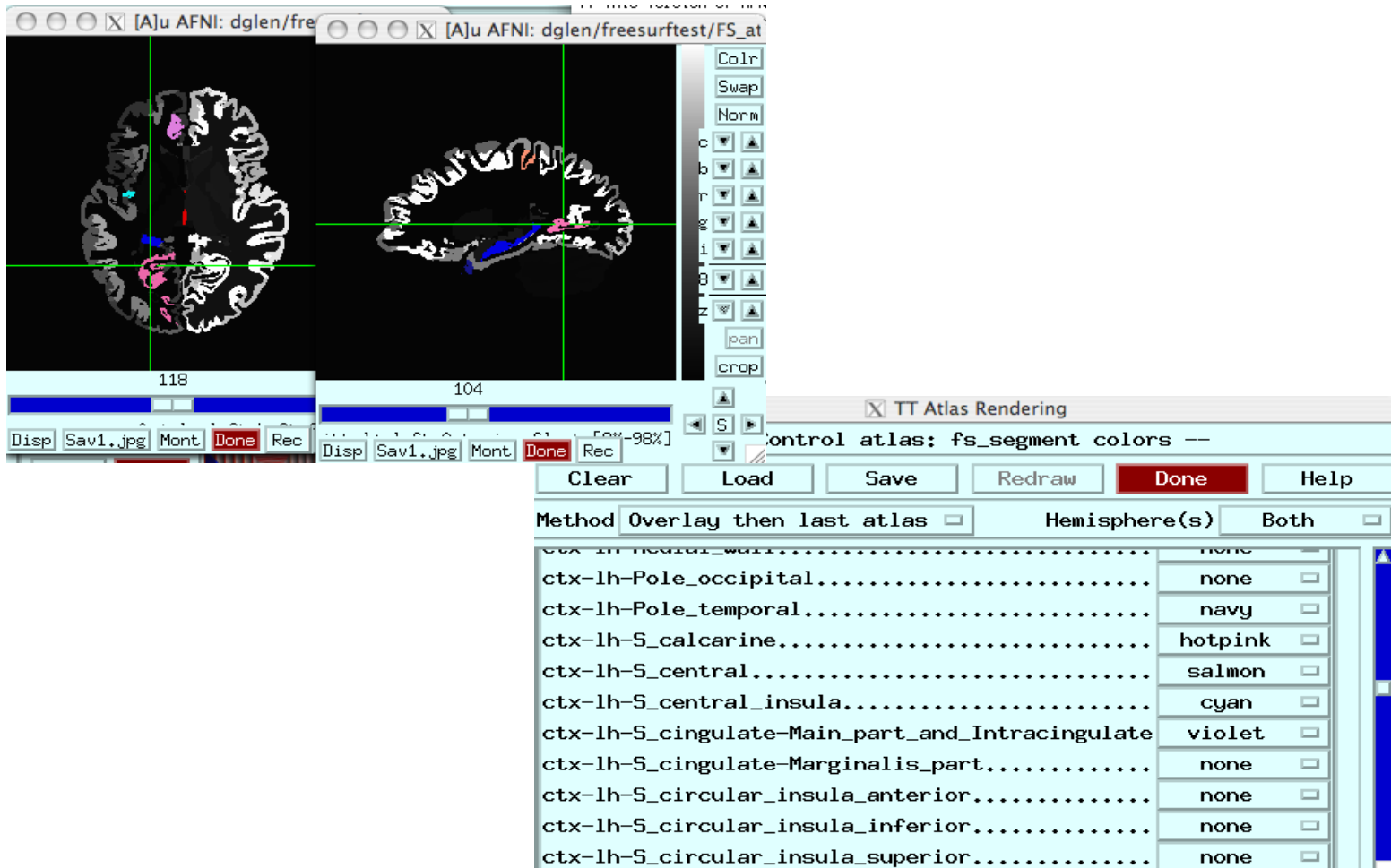
1) Right click to get menu:

- ✧ [\[Go to Atlas Location\]](#)

Lets you jump to centroid of regions to current default atlas (set by `AFNI_ATLAS_COLORS`)
Works in `+orig`, too.



✧ [Atlas colors]



Lets you show atlas regions over your own data (works only in +tlrc).

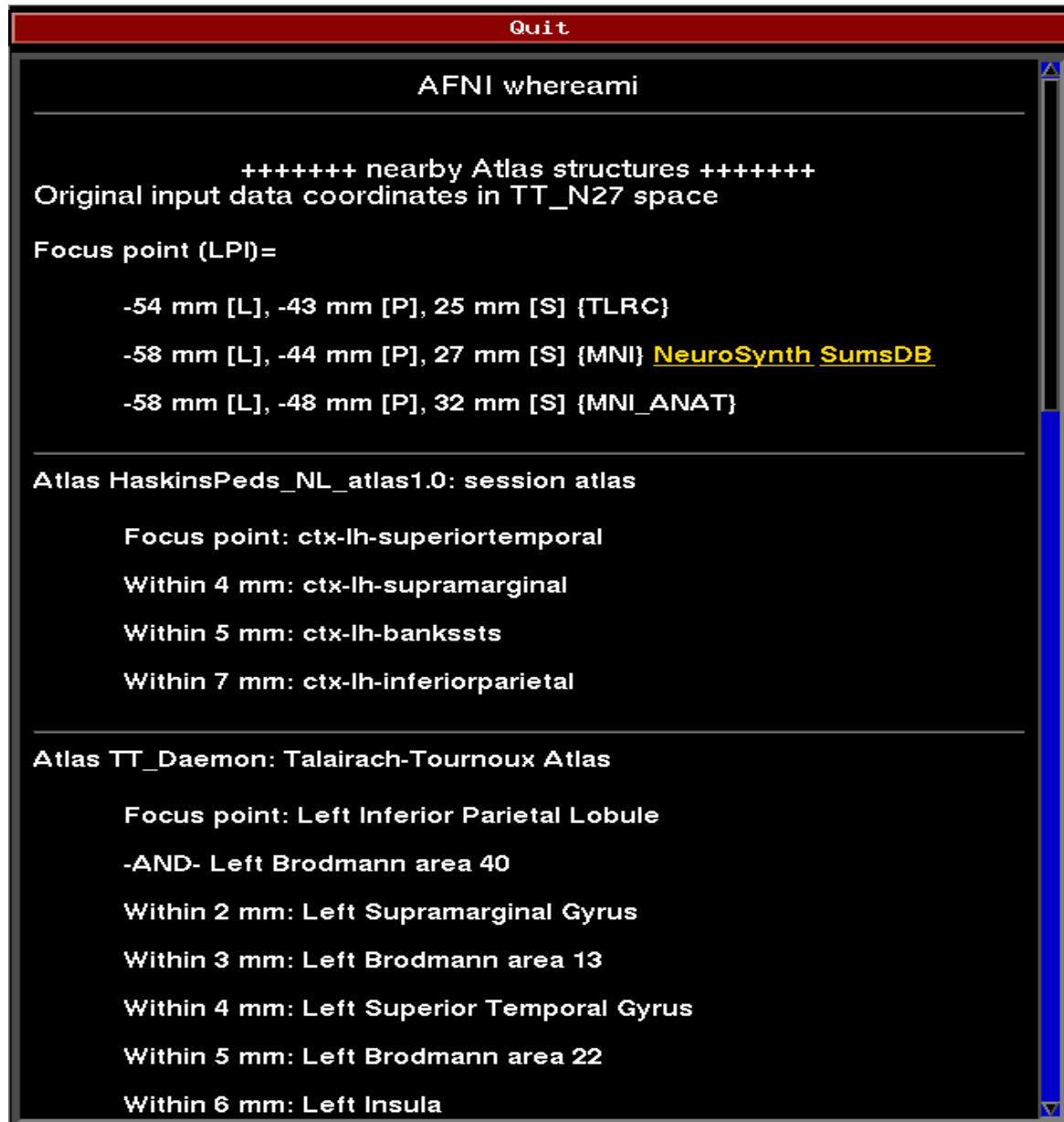
✧ [Where am I?]

Shows you where you are in various atlases and spaces

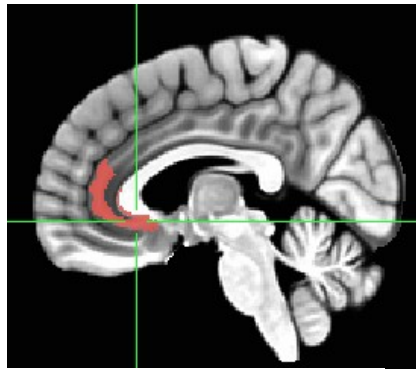
(works in +orig too, if you have a transformed parent)

For atlas installation, and much, much more, see help in command line version:

whereami -help

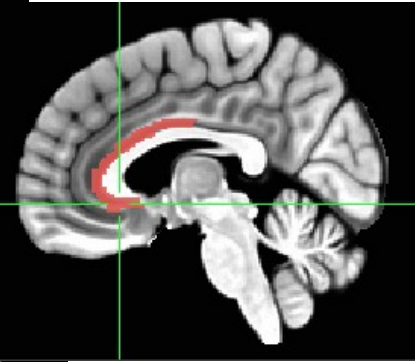


FS (MNI2009c) rostral anterior cingulate

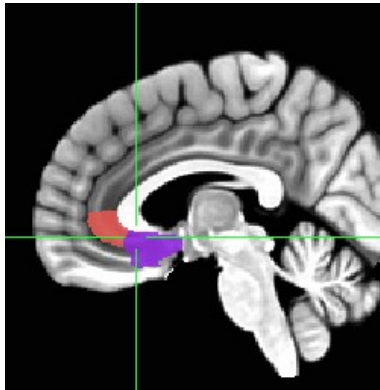


What's in a name ... or a coordinate?

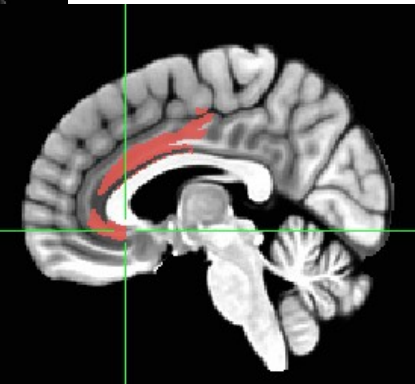
Brainnetome
A24rv_right



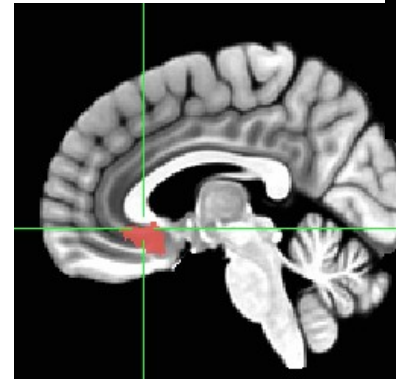
HCP Glasser area A24 (red) and area 25 (purple)



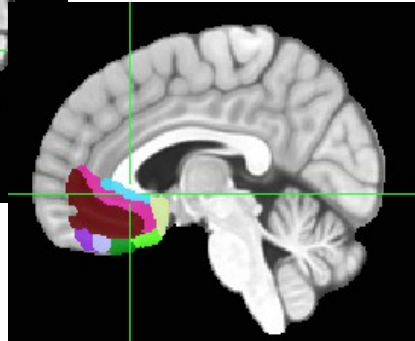
Brodmann-
Pijnenburg BA24



JulichBrain
Area_s24 (sACC)



Ventromedial Prefrontal
Cortex atlas
(Area_s24 (sACC) in cyan)



whereami on the command line

Try these simple examples:

`whereami -show_atlases`

`whereami -space MNI 20 10 5`

`whereami -show_atlas_code`

← Citation info and descriptions

← Understand coordinate order. Use -lpi or default -rai?

`3dinfo -labeltable ~/abin/MNI_caez_ml_18+tlrc.`

`3dinfo -atlas_points ~/abin/MNI_caez_ml_18+tlrc.`

whereami on the command line

whereami can combine usefully with 3dClusterize:

- 1) 3dClusterize finds cluster volumes, and
- 2) whereami provides detailed info like overlap with atlas regions

Ex: can be run in ~/AFNI_data6/afni/

```
# Threshold the index-0 vol (an F-stat) at >9.5 and
# find clusters with >=1000 voxels
```

```
3dClusterize -1sided RIGHT 9.5 \
  -clust_nvox 1000 -NN 1 \
  -inset func_slim+orig -ithr 0 -idat 0 \
  > clusts.1D
```

```
# Use the center of mass coords in
# cols [1,2,3] to show location according
# to several atlases (TT, MNI, etc.); also
# shows nearby structures
```

```
whereami \
  -coord_file \
  clusts.1D' [1,2,3]' \
  -tab | more
```

```
++ Input coordinates orientation set by default rules to RAI
+++++ nearby Atlas structures ++++++

Original input data coordinates in TLRC space

Focus point (LPI)          Coord.Space
  0 mm [L],   0 mm [P],   0 mm [S]  {Unknown}
  2 mm [R],  -60 mm [P],   9 mm [S]  {TT_N27}
  2 mm [R],  -60 mm [P],   9 mm [S]  {TT_avg}

Atlas      Within  Label          Prob.  Code
TT_Daemon  0.0    Right Posterior Cingulate  MPM    20
TT_Daemon  2.0    Right Cuneus                MPM    40
TT_Daemon  3.0    Left Posterior Cingulate    MPM    220
TT_Daemon  4.0    Left Cuneus                 MPM    240
TT_Daemon  6.0    Right Lingual Gyrus         MPM    32
CA_N27_ML  0.0    Right Calcarine Gyrus      ---    44
CA_N27_ML  1.0    Left Calcarine Gyrus       ---    43
CA_N27_ML  1.0    Left Lingual Gyrus         ---    47
CA_N27_ML  2.0    Right Lingual Gyrus        ---    48
CA_N27_ML  5.0    Cerebellar Vermis (4/5)    ---    111
CA_N27_MPM 0.0    Area 17                    ---    181
CA_N27_MPM 3.0    Area 18                    ---    240
CA_N27_PM  0.0    Area 17                    0.60   38
CA_N27_PM  0.0    Area 18                    0.30   67
```

whereami on the command line

whereami can also report the overlap of ROIs with atlases

Ex: can be run in ~/AFNI_data6/afni/

Quick way to make test ROI a sphere at a given location)

echo -14 66 23 > tmp.txt

3dUndump

-xyz

-prefix tmproi.nii.gz

-master anat+tlrc

-datum byte

-srad 9.5

tmp.txt

report overlap

**whereami **

-omask tmproi.nii.gz



```

++ Input coordinates orientation set by default rules to RAI
++ In ordered mode ...
++ Have 2 unique values of:
  0  1
++ Skipping unique value of 0
++ =====
++ Processing unique value of 1
++   3695 voxels in ROI
++   3695 voxels in atlas-resampled mask
Intersection of ROI (valued 1) with atlas TT_Daemon (sb0):
  63.3 % overlap with Right Precuneus, code 45
  17.6 % overlap with Right Cuneus, code 40
  7.9 % overlap with Right Posterior Cingulate, code 20
  -----
  88.8 % of cluster accounted for.

Intersection of ROI (valued 1) with atlas TT_Daemon (sb1):
  29.7 % overlap with Right Brodmann area 31, code 107
  10.2 % overlap with Right Brodmann area 18, code 95
  3.2 % overlap with Right Brodmann area 7, code 87

```

Make your own atlas!

- New atlases - easy and fun. Make your own!
 - ✧ make available in AFNI GUI and whereami and to other user

```
@Afnienv -set AFNI_SUPP_ATLAS_DIR ~/MyCustomAtlases/
```

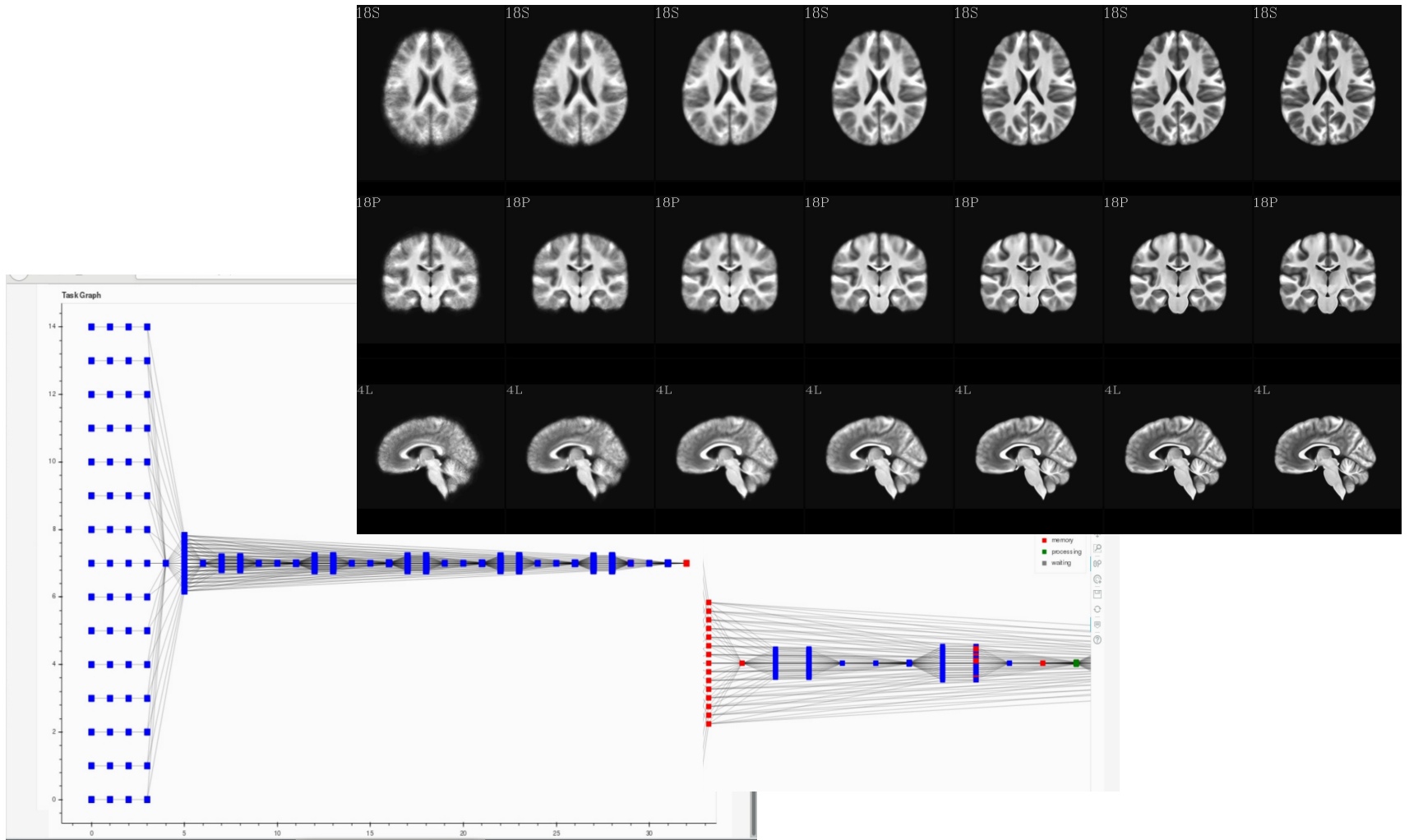
Then:

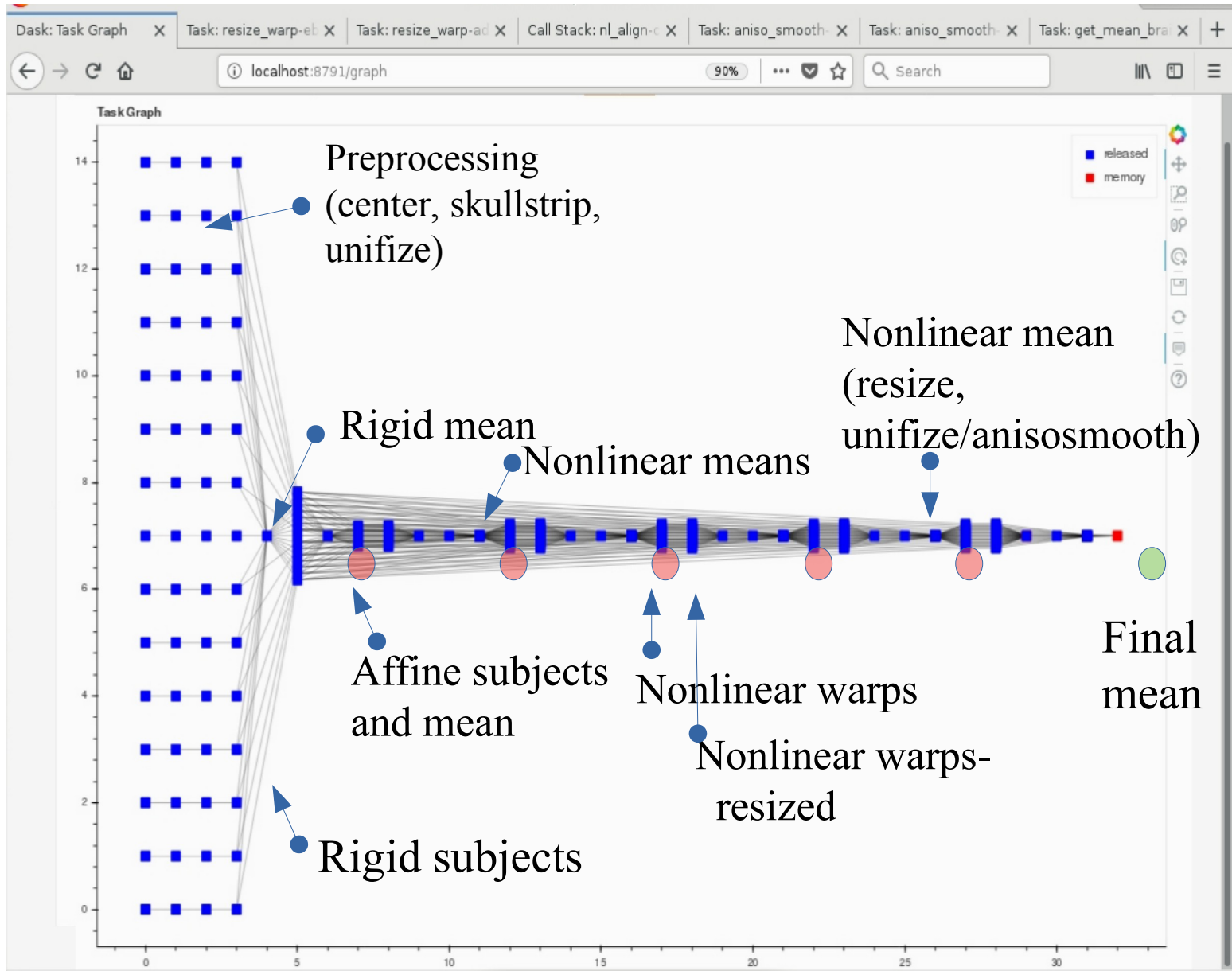
```
@Atlasize -space MNI -dset atlas_for_all.nii \  
          -lab_file keys.txt 1 0 -atlas_type G
```

In ~/MyCustomAtlases/ you will now find atlas_for_all.nii along along with a modified CustomAtlases.niml file.

Make your own template

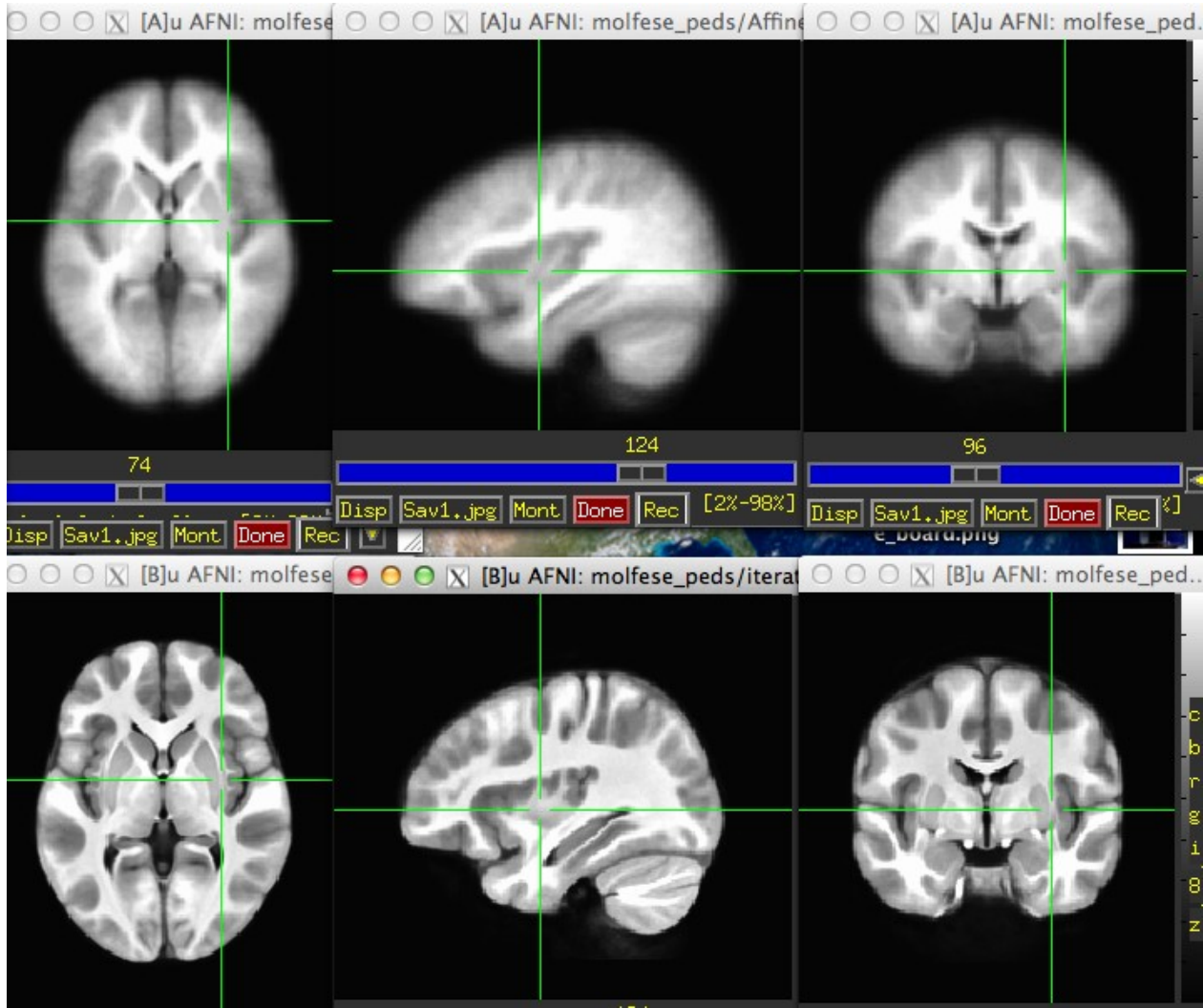
make_template_dask.py - Dask
parallelization - 10, 100 or 1000
subjects on a cluster, server or PC





Dask Template task graph

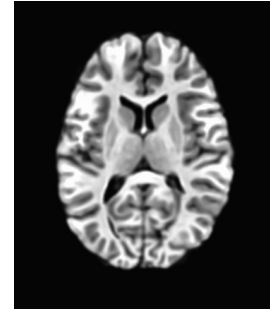
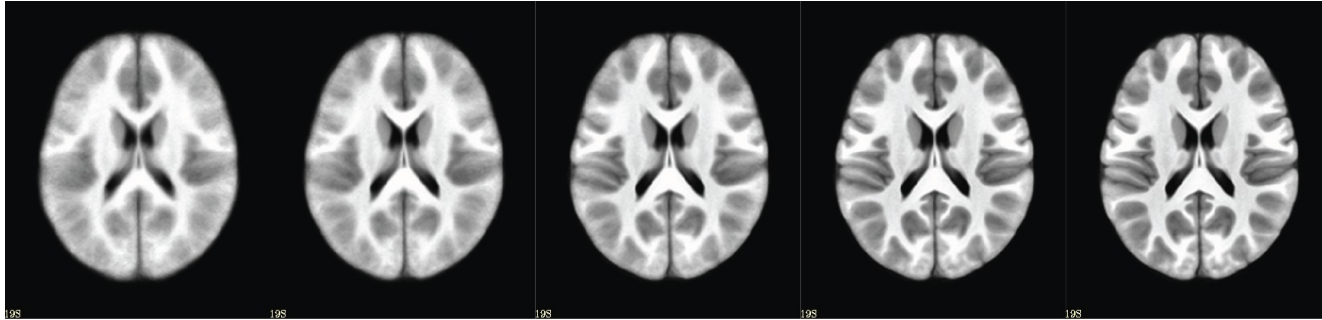
Haskins Pediatric Atlas: the templates



Affine Group

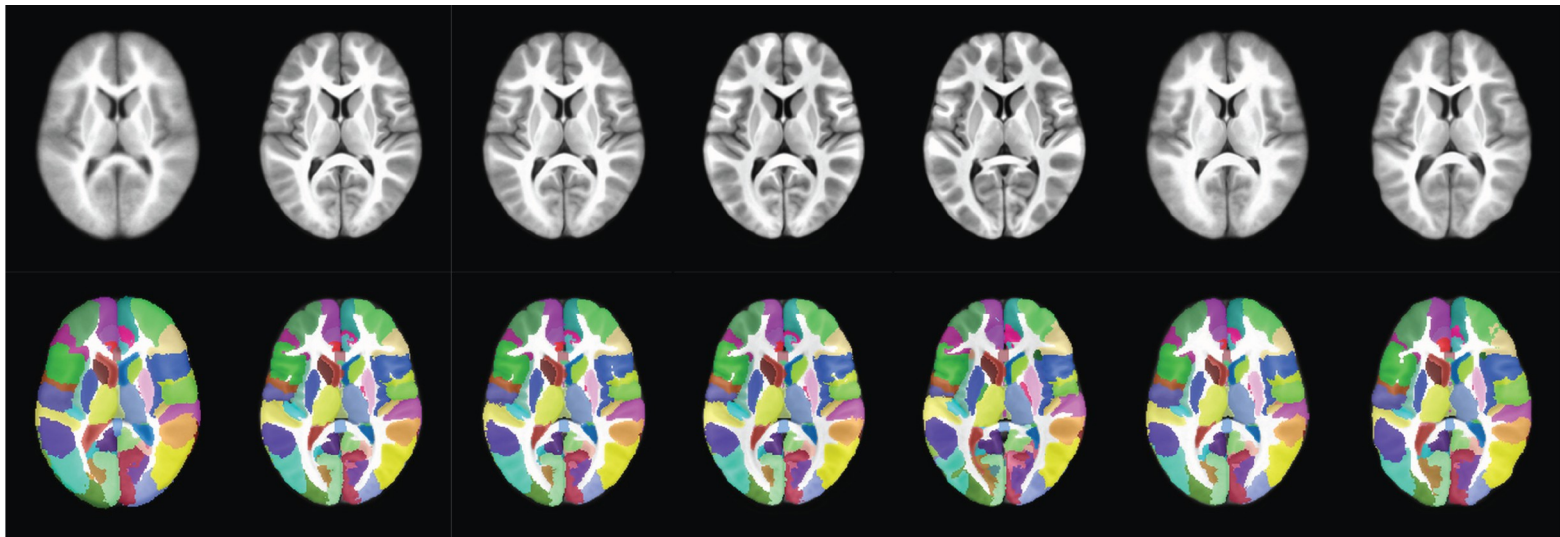
Nonlinear
Group I -
iterative

ALTERNATIVE ATLAS CREATION TECHNIQUES: ITERATIVE AND TYPICAL METHODS



Iterative nonlinear alignment to affine template with progressively smaller patch sizes

**“Typical”
Brain**



Affine

Affine
Iterative

Typical
Iterative

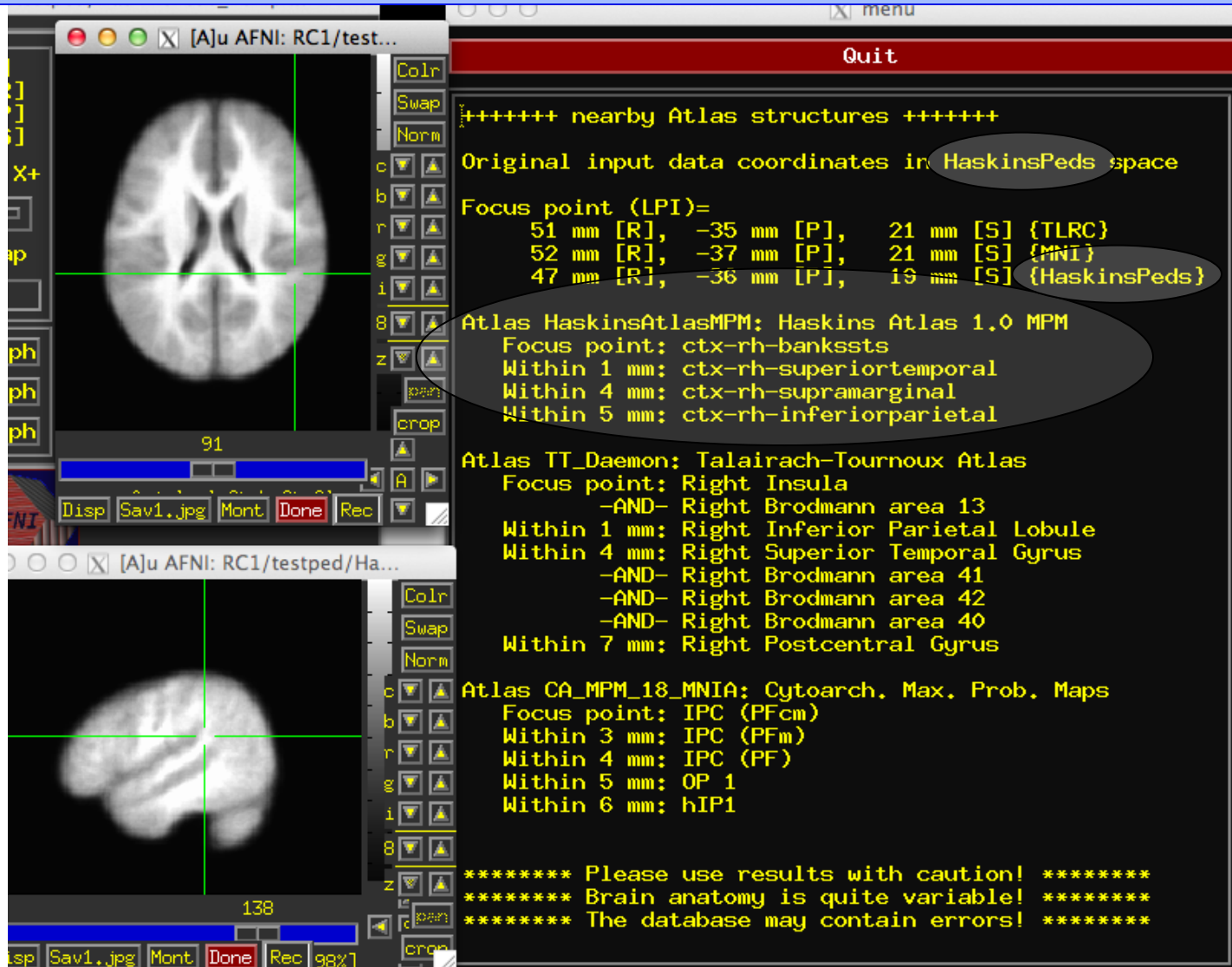
MNI
Iterative

Nonlinear
to MNI

Nonlinear
to Affine

Nonlinear
to Typical

Haskins Pediatric Atlas



The image shows a screenshot of the AFNI (Analysis of Functional NeuroImages) software interface. On the left, there are two axial brain MRI slices. The top slice is labeled '91' and the bottom slice is labeled '138'. To the right of the slices is a control panel with various buttons and sliders for image manipulation. The main window on the right is a terminal window titled 'Quit' with a red header bar. It displays the following text:

```
+++++++ nearby Atlas structures +++++++
Original input data coordinates in HaskinsPeds space

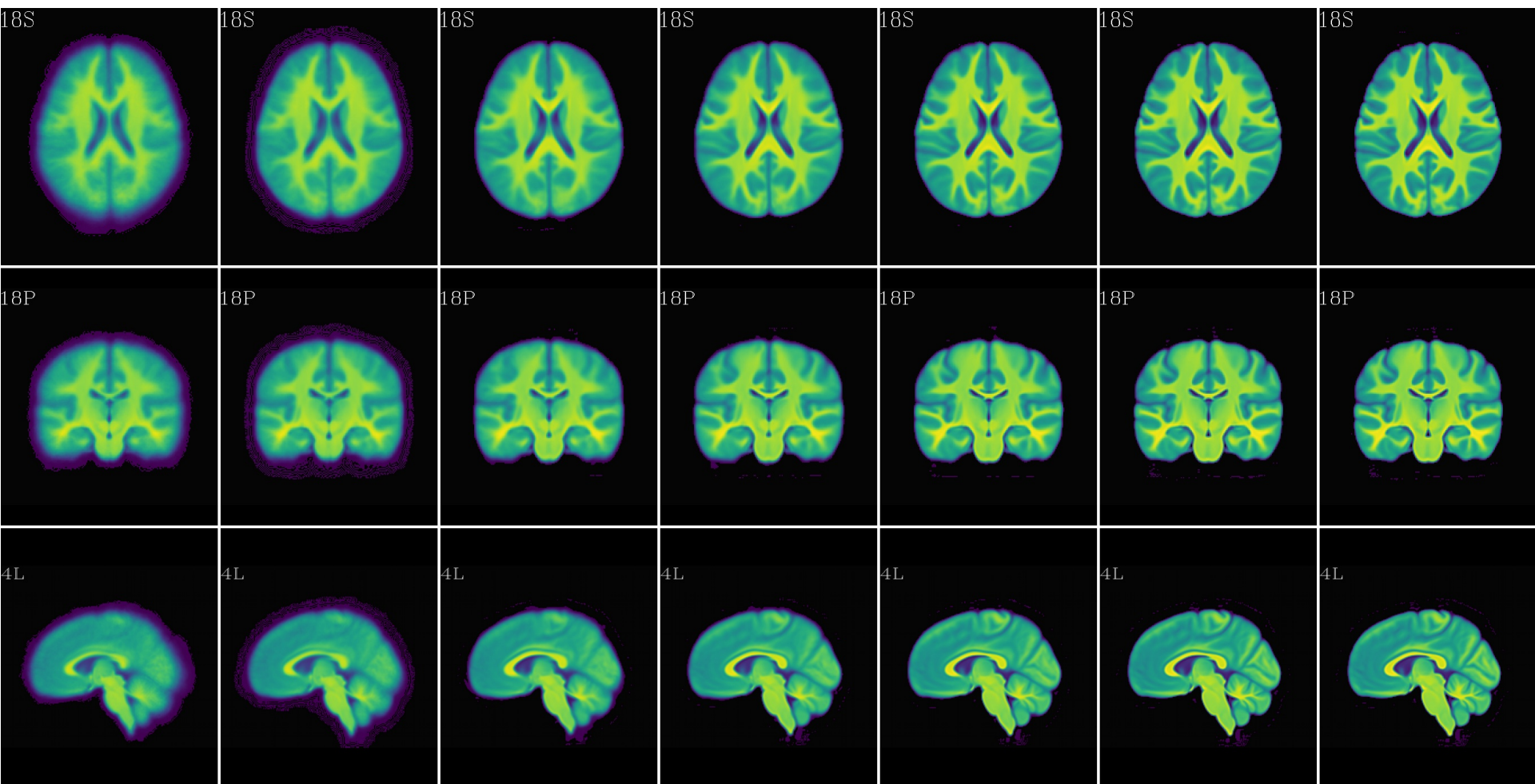
Focus point (LPI)=
  51 mm [R], -35 mm [P],  21 mm [S] {TLRC}
  52 mm [R], -37 mm [P],  21 mm [S] {MNI}
  47 mm [R], -36 mm [P],  19 mm [S] {HaskinsPeds}

Atlas HaskinsAtlasMPM: Haskins Atlas 1.0 MPM
Focus point: ctx-rh-bankssts
Within 1 mm: ctx-rh-superiortemporal
Within 4 mm: ctx-rh-supramarginal
Within 5 mm: ctx-rh-inferiorparietal

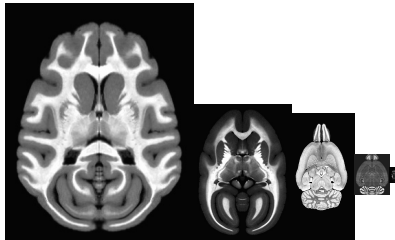
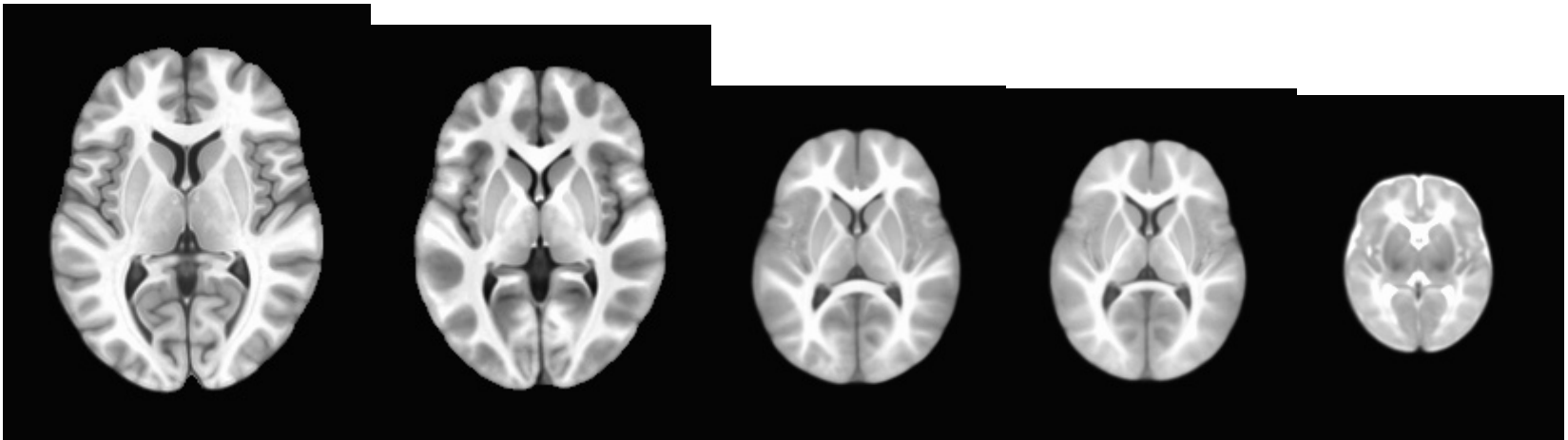
Atlas TT_Daemon: Talairach-Tournoux Atlas
Focus point: Right Insula
-AND- Right Brodmann area 13
Within 1 mm: Right Inferior Parietal Lobule
Within 4 mm: Right Superior Temporal Gyrus
-AND- Right Brodmann area 41
-AND- Right Brodmann area 42
-AND- Right Brodmann area 40
Within 7 mm: Right Postcentral Gyrus

Atlas CA_MPM_18_MNIA: Cytoarch. Max. Prob. Maps
Focus point: IPC (PFcm)
Within 3 mm: IPC (PFm)
Within 4 mm: IPC (PF)
Within 5 mm: OP 1
Within 6 mm: hIP1

***** Please use results with caution! *****
***** Brain anatomy is quite variable! *****
***** The database may contain errors! *****
```

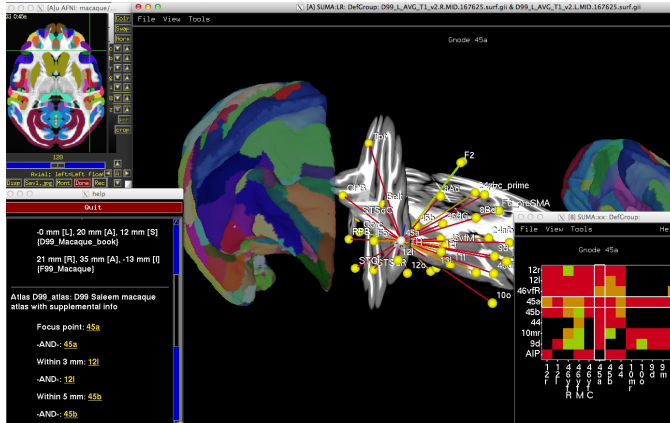


Indian Brain Template C2: IBT
@Install_IBT



Templates and Atlases across Species in AFNI

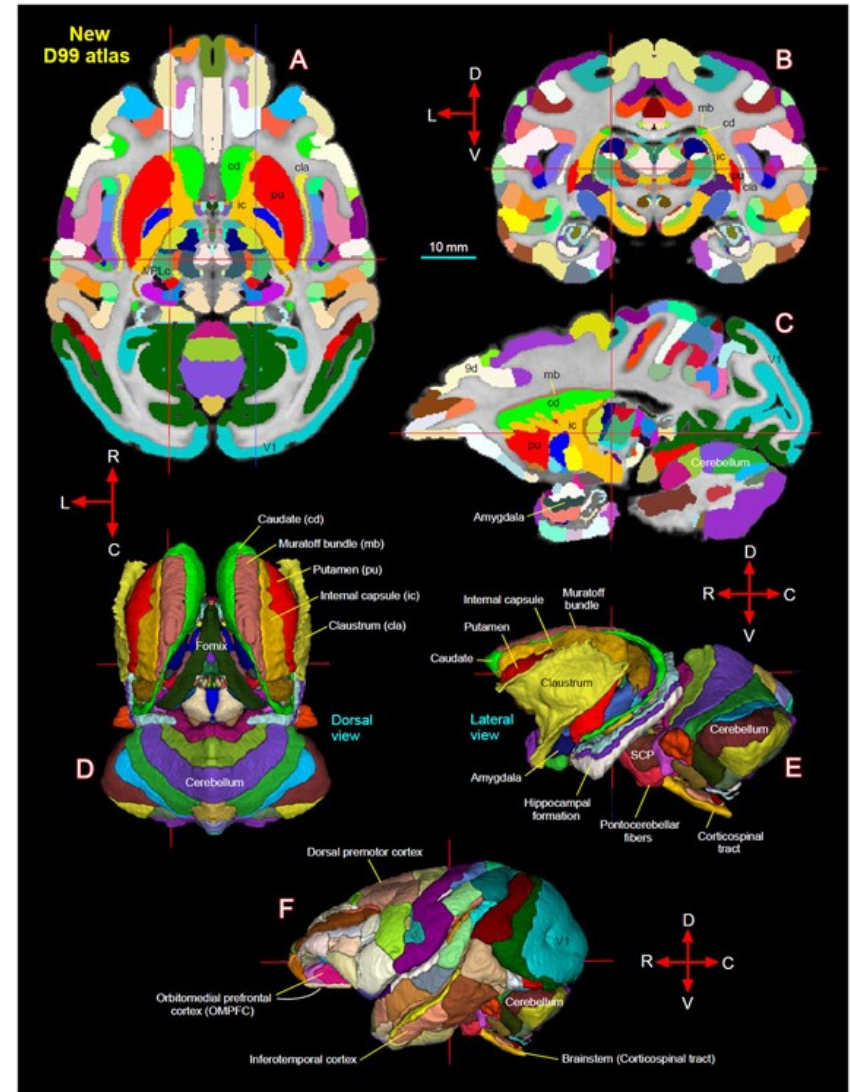
Saleem macaque atlas – MRI, surfaces, connections, subcortical regions



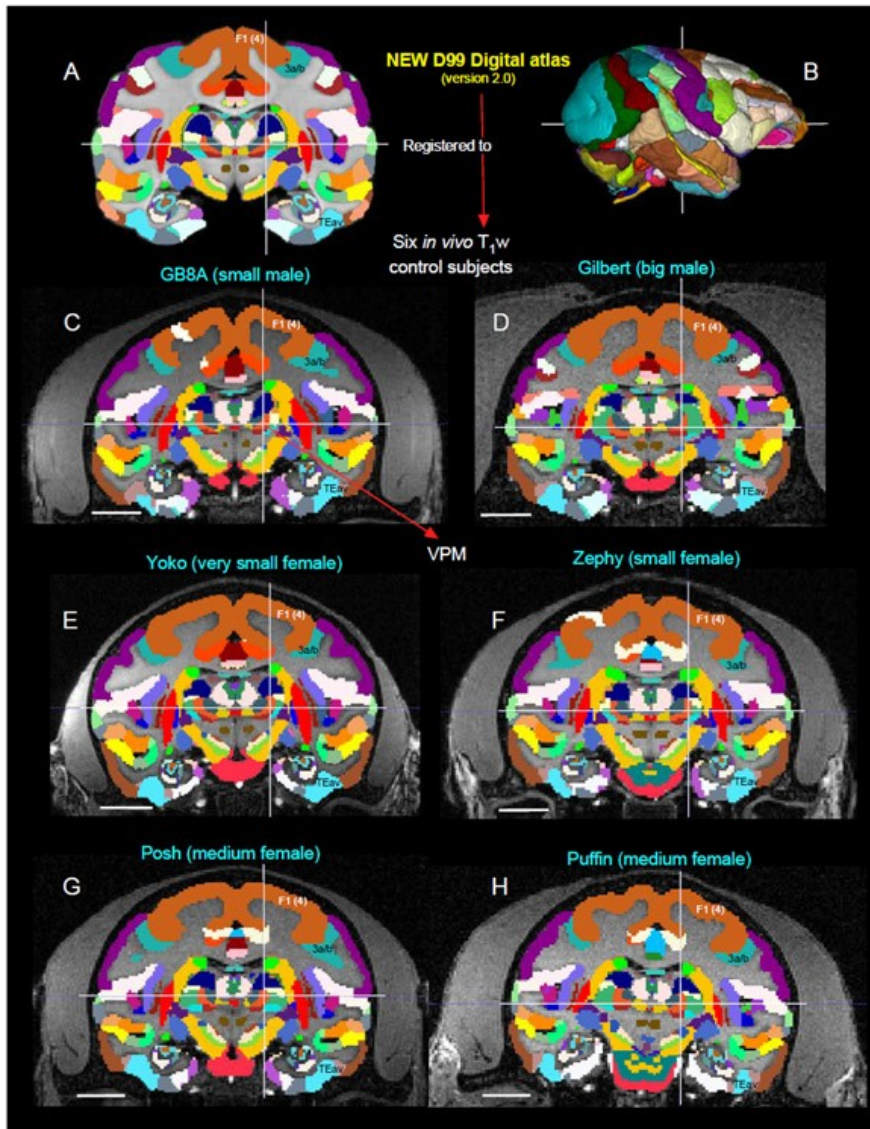
@Install_D99_macaque

Marmoset subcortical atlas too!

@Install_SAM_marmoset



@Install_D99_macaque - install templates, atlas and set AFNI variables



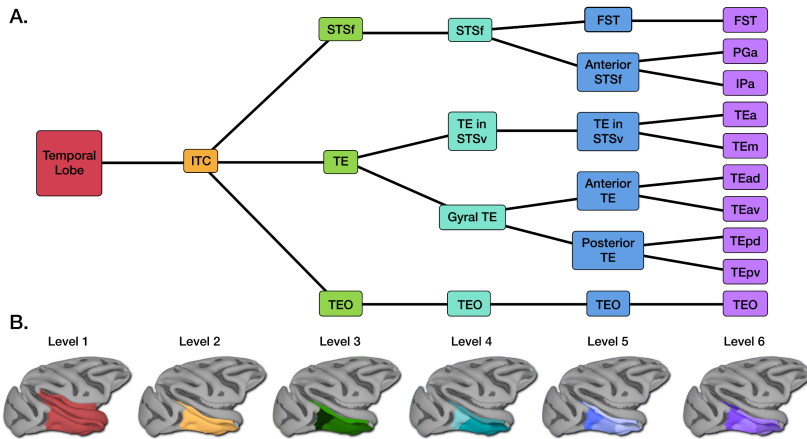
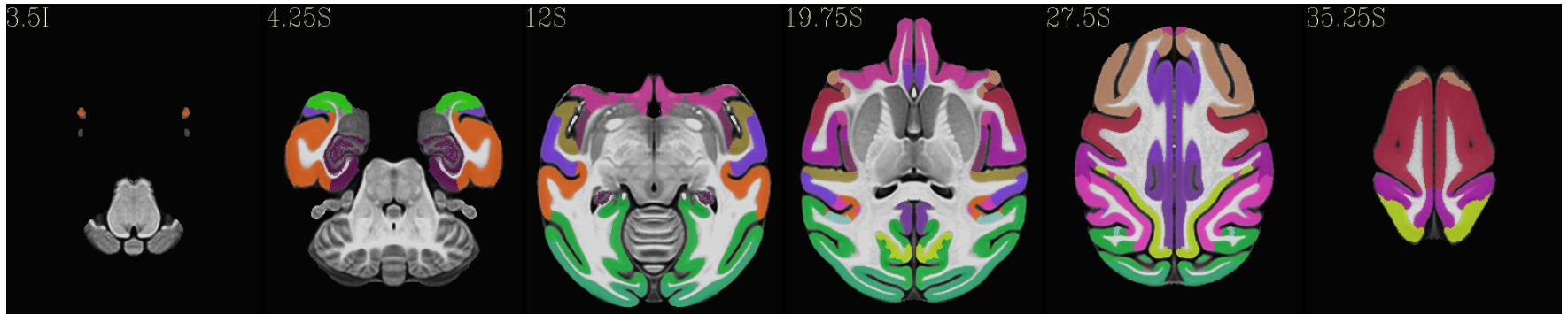
Alignment with
[@animal_warper](#)

-feature_size to control
 for various animal
 resolution “features” -
 blurring and
 neighborhood size for
 alignment costs

Moves dataset to template
 space and atlases to
 native space

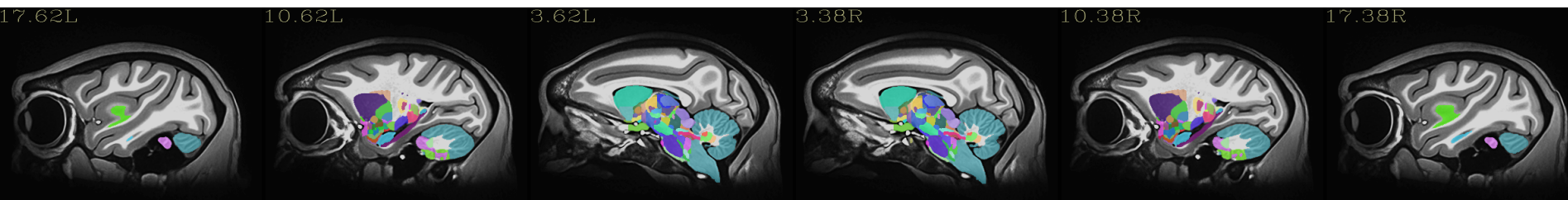
NMT (NIH Macaque Template)

Group template from 31 macaques (+ surfaces, GM/WM/CSF segmentation)



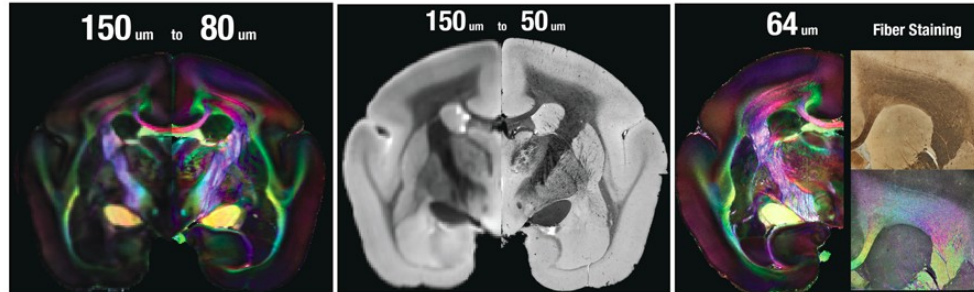
With CHARM -
6 level cortical hierarchical atlas!

And SARM -
6 level subcortical hierarchical atlas!
@Install_NMT

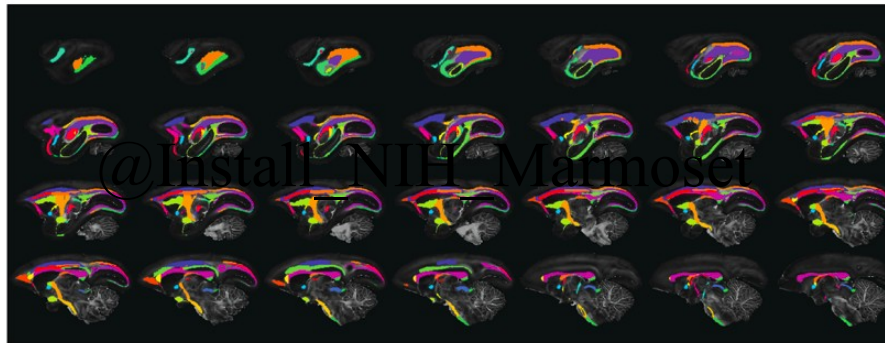


2018: *improved* NIH Marmoset Template

Better Data



Detailed labels



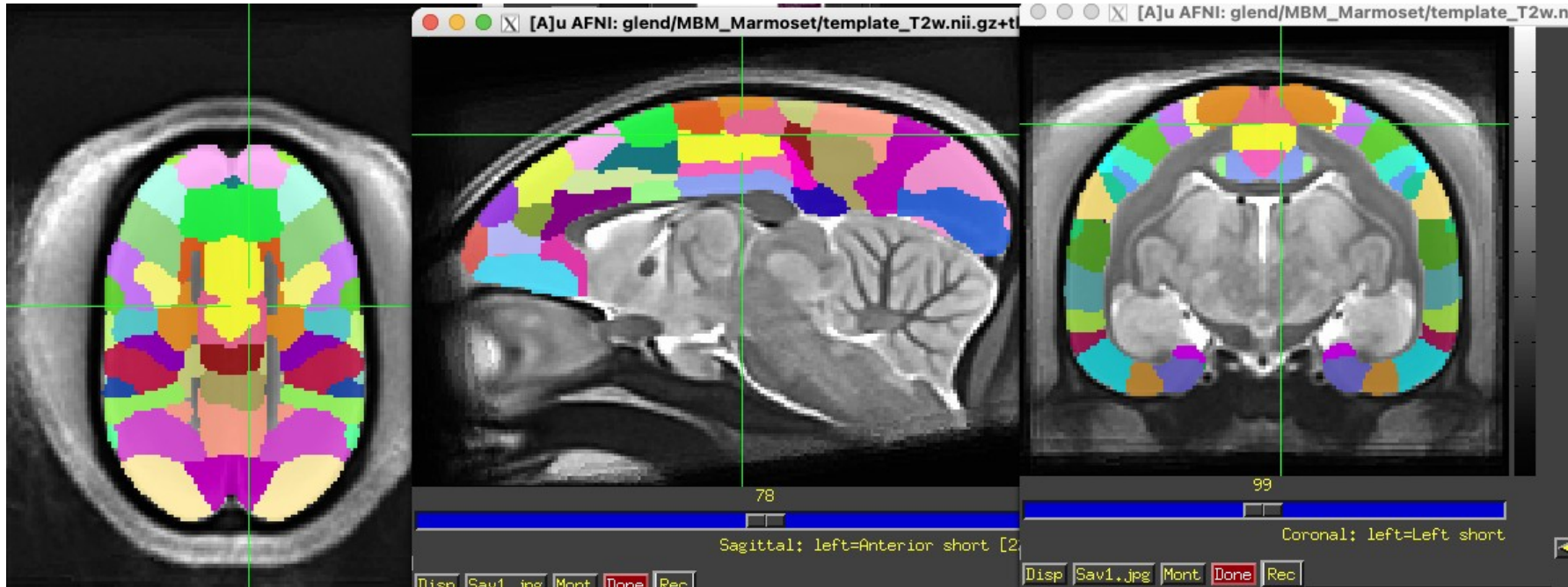
Support with tracing data, connectome and atlas utilities

@Install_NIH_Marmoset



(Liu et al., 2018, SfN)

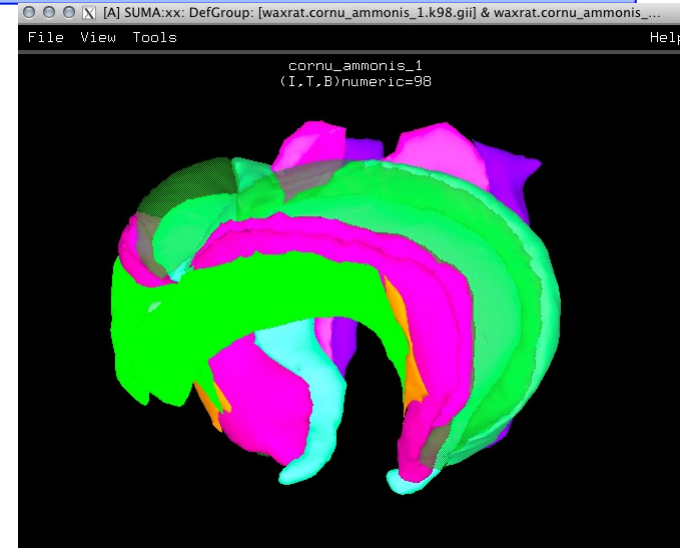
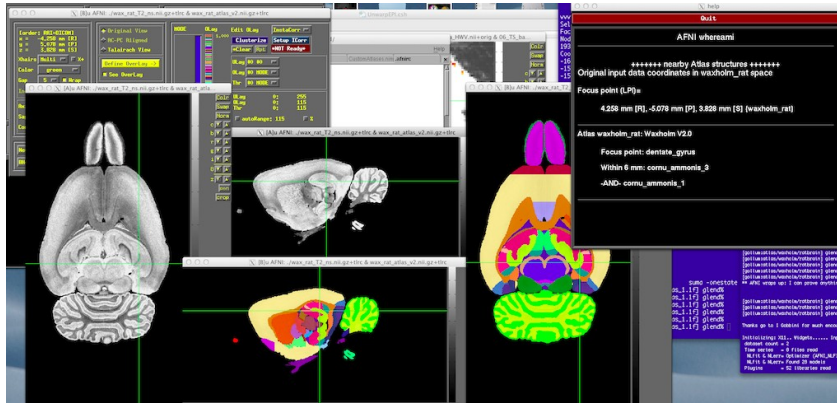
2020: more *improved* MBM Marmoset Population Template MBMv3



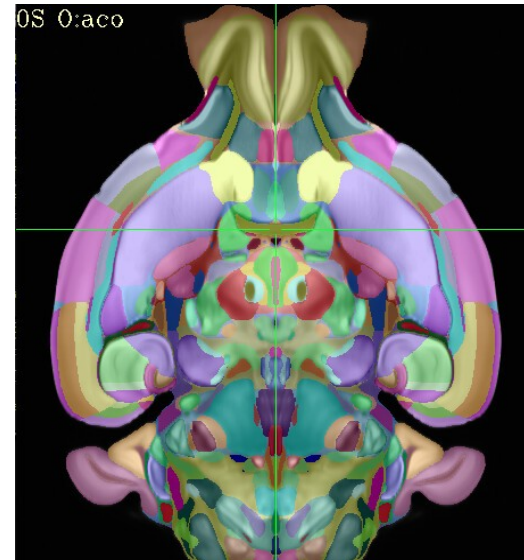
@Install_MB_Marmoset,
MBMv4 - resting state networks soon

Rats and Mice

Waxholm Rat Atlas - Papp, et al. - AFNI version

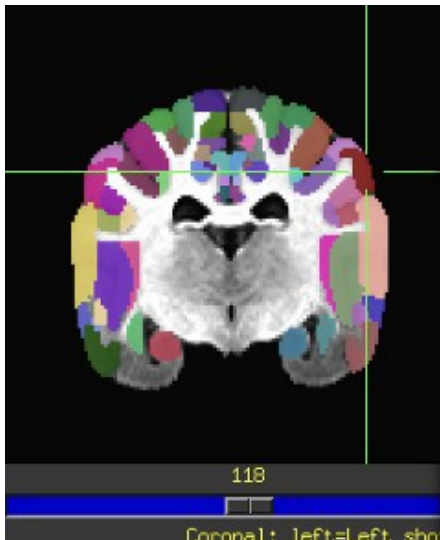


Allen Mouse CCF3 - AFNI version



And Dogs

CornDog - Philippa Johnson at Cornell



118
Coronal; left=Left sho

AFNI whereami

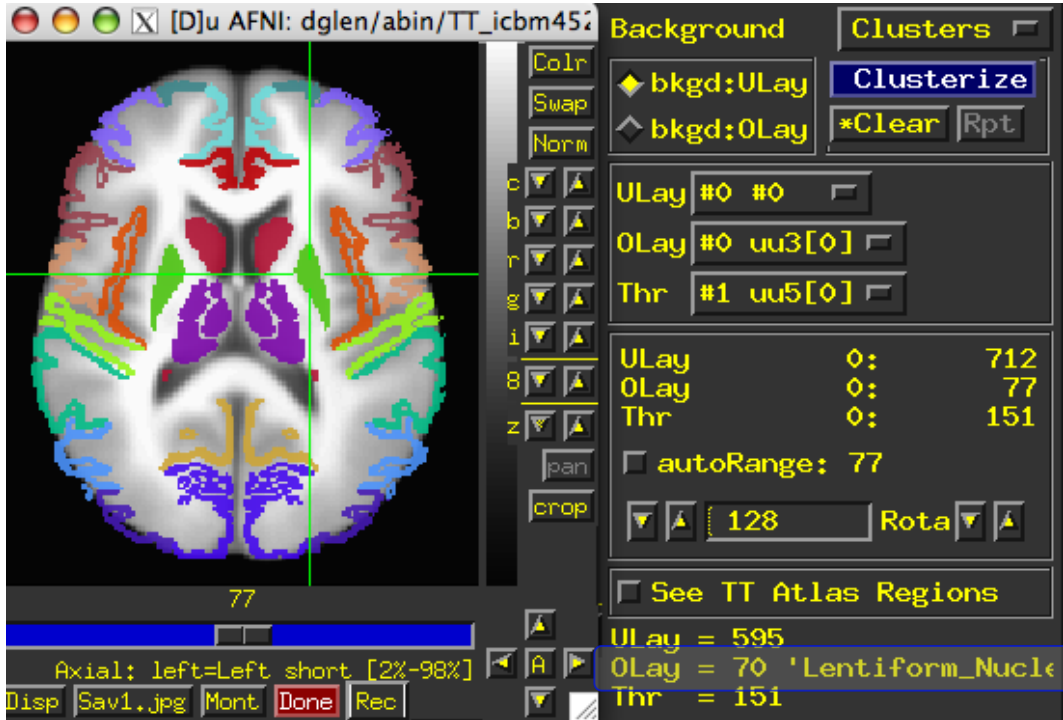
+++++++ nearby Atlas structures +++++++
Original input data coordinates in CornDog3 space
Focus point (LPI) =
21.25 mm [R], -8.25 mm [P], 19.25 mm [S] {CornDog3}

Atlas CornDog3_cort: CornDog Cornell Canine Cortical Atlas

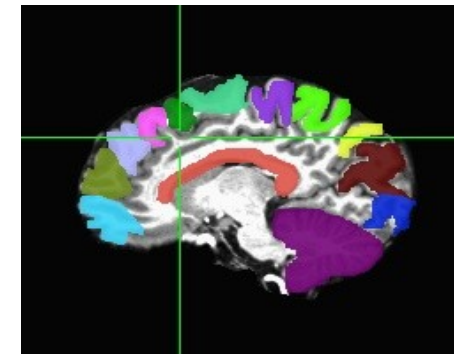
Focus point: rh_PS_EAc [RH_Temporal_Ectosylvia-accessoria]
* Within 2 mm: rh_PS_EM [RH_Temporal_Ectosylvia-medialis]
* Within 5 mm: rh_PS_EV [RH_Temporal_Paraectosylvia-ventralis]

Individual Subjects

@SUMA_MakeSpecFS - atlasizes too!



FreeSurfer segmentation



Manual segmentation

Overlay panel shows structure name. Now FreeSurfer segmentation can also be used in whereami.