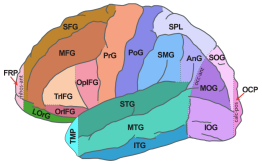
Hackathon challenge #3: MNI152 mashup

Anatomical labels, shape measures, and gene expression in MNI152 space

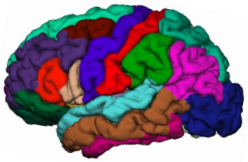
Mindboggle-102 team

arno klein / jason tourville / jay bohland / rich stoner

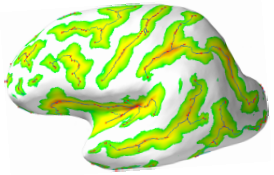
Mashup components

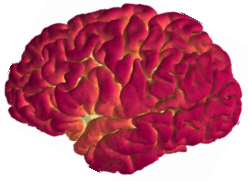


DKT labeling protocol &
Mindboggle-101 brains

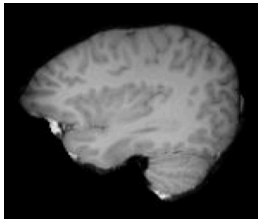


Mindboggle software:
features and shapes

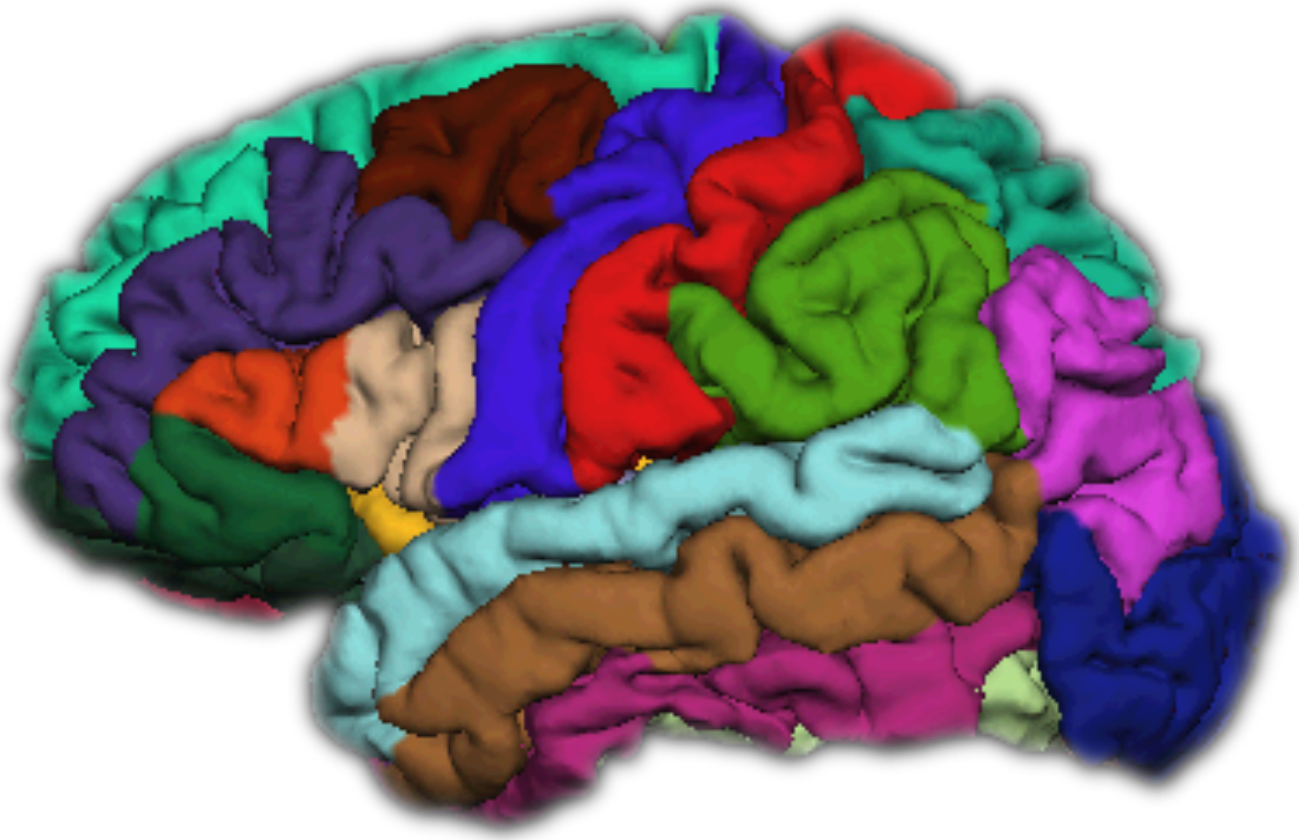




Allen human T1 image
and gene expression data

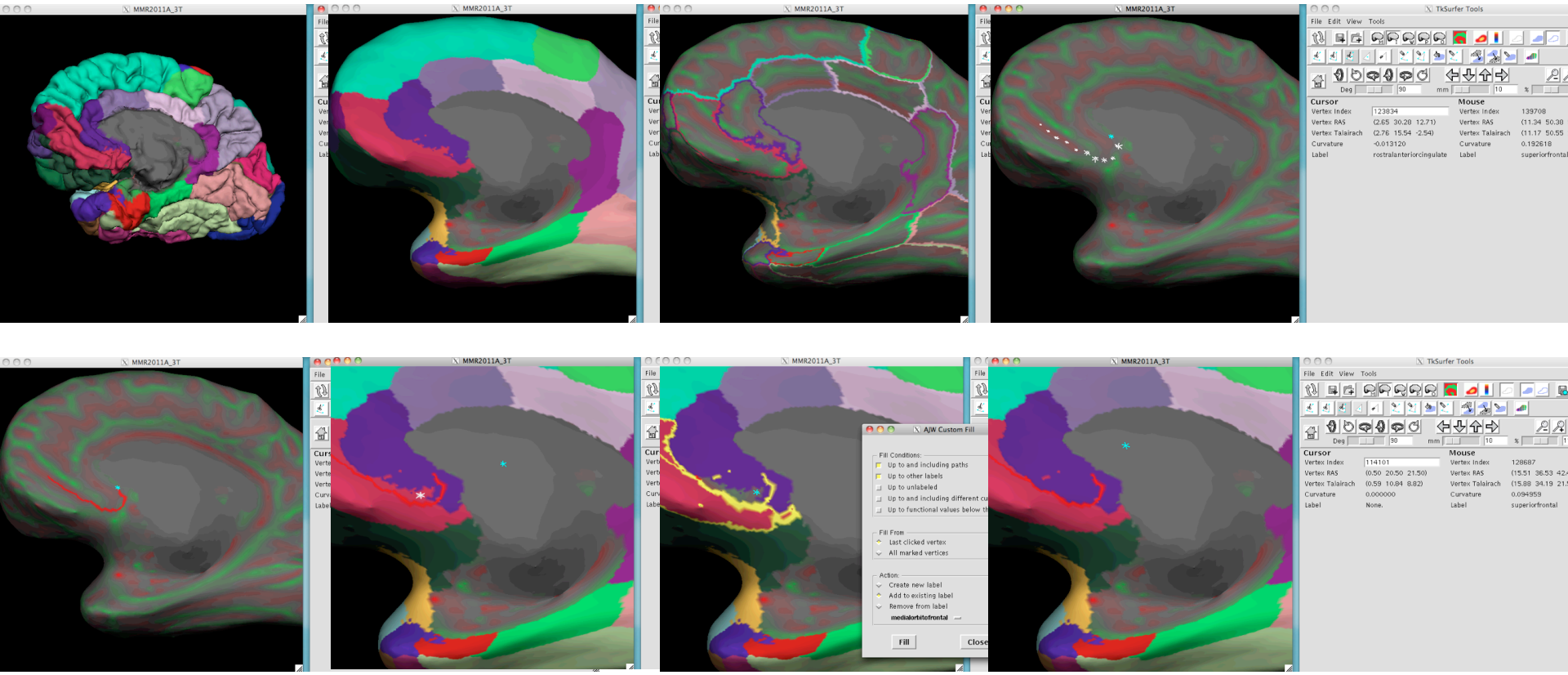


Desikan-Killiany-Tourville (DKT) labeling protocol



http://www.braincolor.org

DKT labeling protocol



Manual editing of cortical surface labels

Mindboggle-101 dataset

Name	Source	N	Age (mean, SD)	Gender		Hand	
				M	F	R	L
NKI-RS-22	"Nathan Kline Institute / Rockland Sample"	22	20-40 (26.0, 5.2)	12	10	21	1
NKI-TRT-24	"Nathan Kline Institute / Test-Retest"	24	21-60 (34.4, 12.6)	18	6	19*	3*
MMRR-21	"Multi-Modal MRI Reproducibility Resource"	21	22-61 (31,8, 9.2)	11	10	18	1
MMRR-3T7T-2	2 3T/7T subjects acquired after the MMRR-21 subjects	2	22, 24	2	0	2	0
HLN-12	"Human Language Network" study subjects	12	23-39 (27.8, 4.6)	6	6	12	0
OASIS-TRT-20	"Open Access Series of Imaging Studies" test-retest ("reliability") sample	20	19-34 (23.4, 3.9)	8	12	20	0

NKI-RS-22	http://fcon_1000.projects.nitrc.org/indi/pro/nki.html
NKI-TRT-24	http://fcon_1000.projects.nitrc.org/indi/pro/eNKI_RS_TRT/FrontPage.html
MMRR-21	http://www.nitrc.org/projects/multimodal
MMRR-3T7T-2	http://www.nitrc.org/projects/multimodal
HLN-12	https://masi.vuse.vanderbilt.edu/public/plos12.tar.bz2
OASIS-TRT-20	http://www.oasis-brains.org/app/action/BundleAction/bundle/OAS1_RELIABILITY

*(2 ambidextrous)

Mindboggle 101: Manually Labeled Brain Surfaces and Volumes

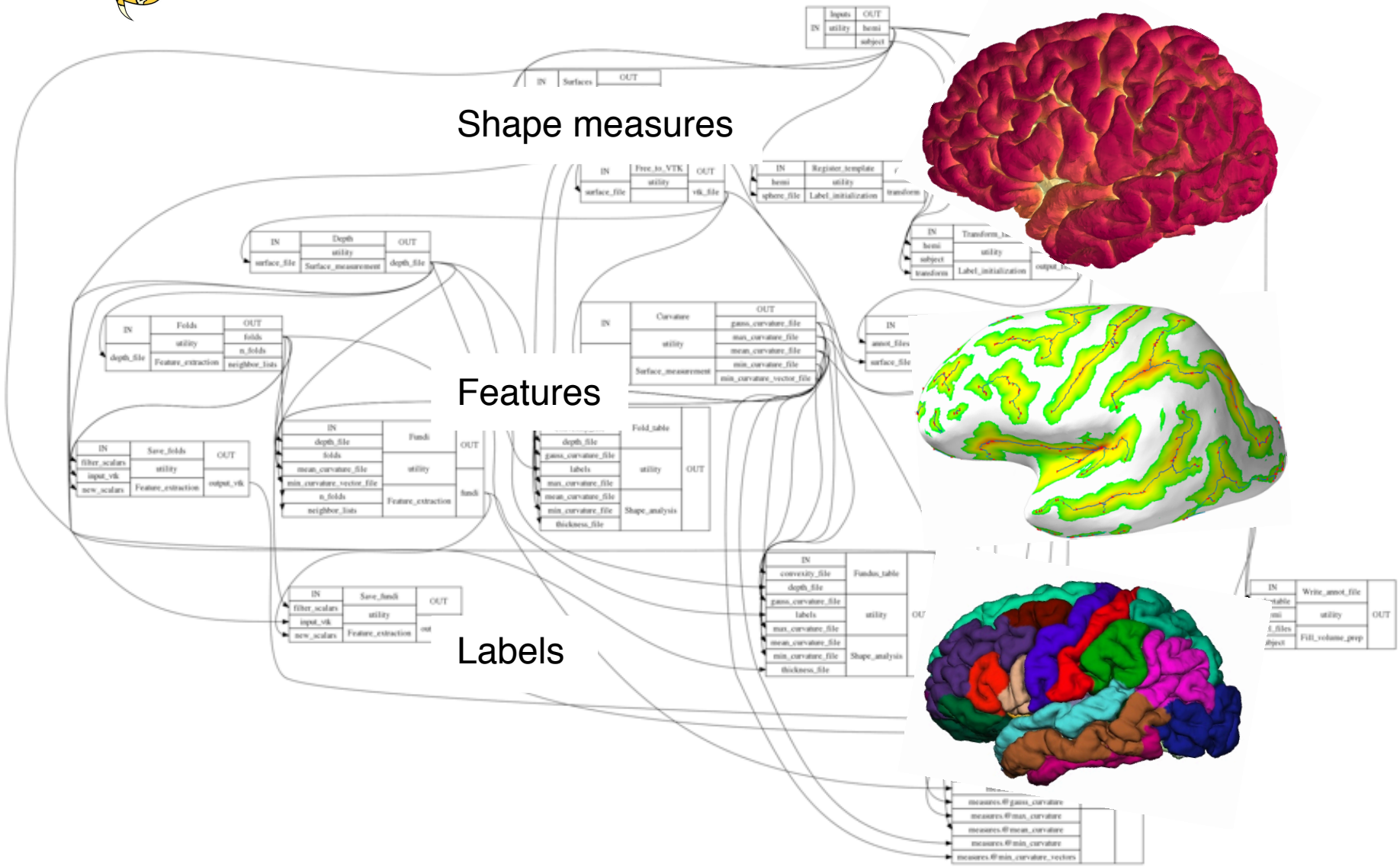
by OHBM Organizing Committee - Jun 17th, 2013 - posted in Datasets

Mindboggle-101: Manually labeled brain surfaces and volumes

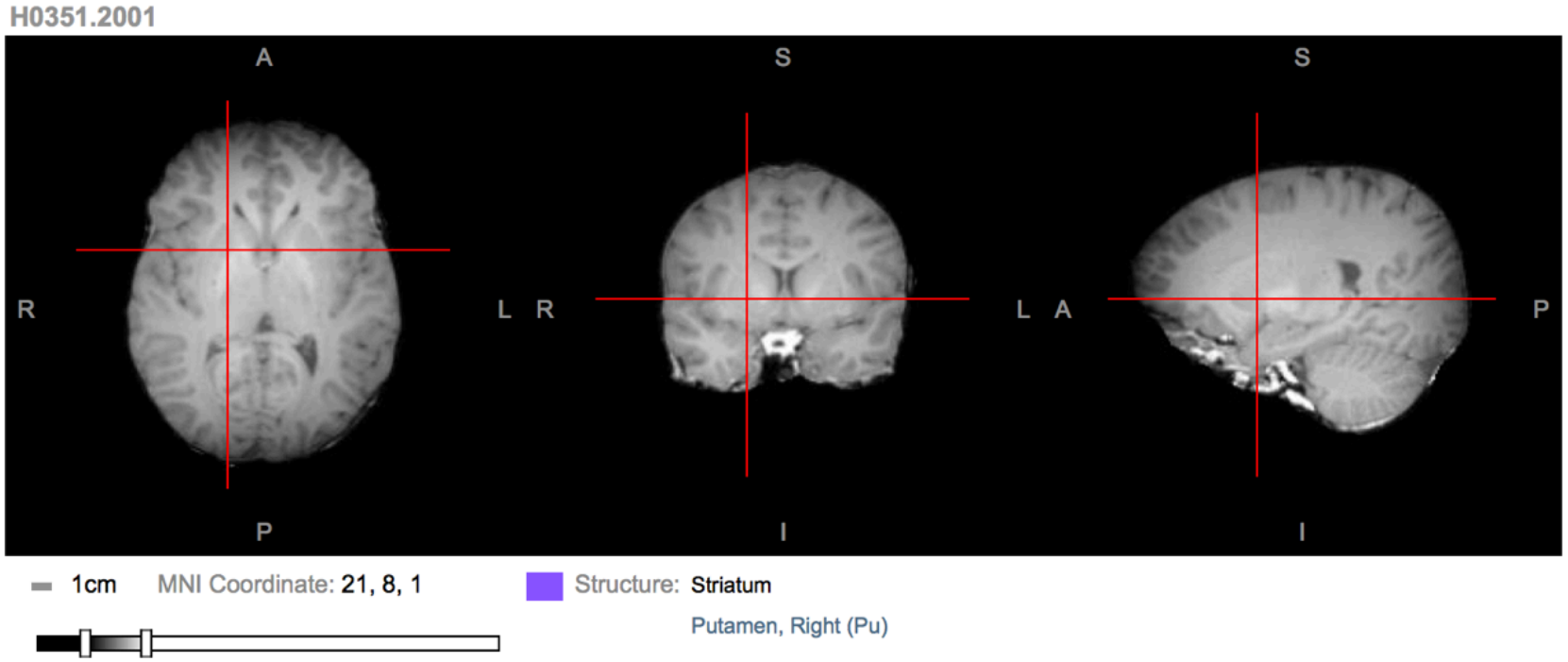
The Mindboggle-101 dataset includes manually labeled anatomical regions for 101 healthy subjects. The manually edited cortical labels follow sulcus landmarks according to the Desikan-Killiany-Tourville (DKT) protocol. The protocol, individually labeled brain images, optimal average surface and volume templates, and a surface Gaussian classifier atlas are all available for download and are described in the following article:

http://www.mindboggle.info/papers/

Mindboggle software



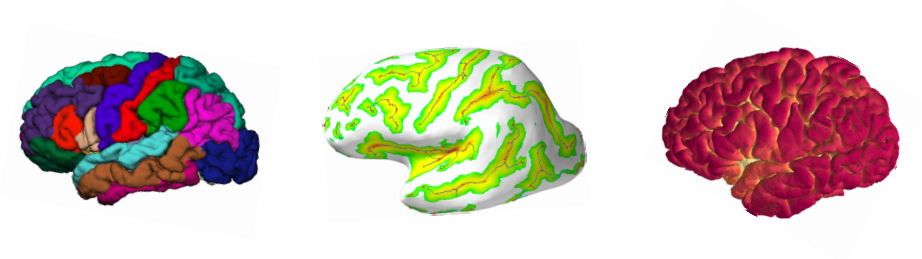
Allen human brain image and gene expression data



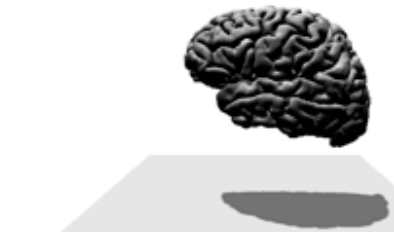
Goals

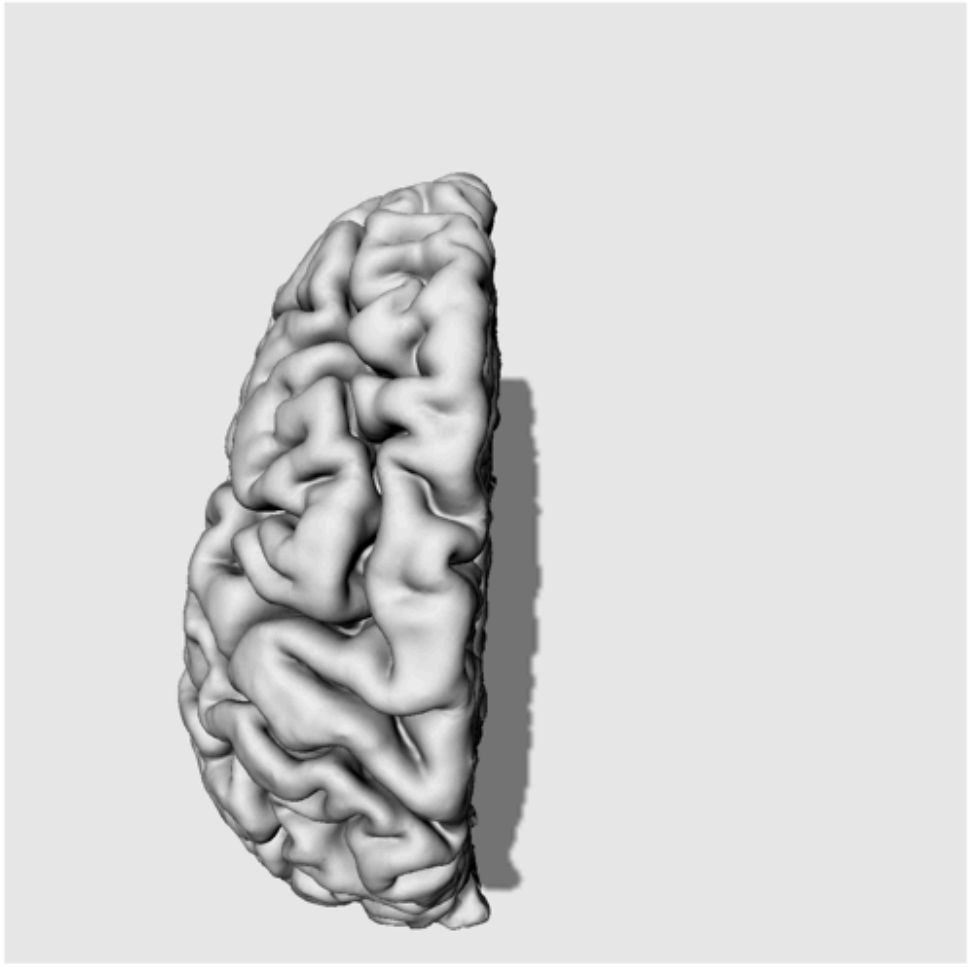
(1) Provide anatomical label, feature, and shape information for **101 brains in MNI152 space**.

(2) Provide anatomical label, feature, and shape information for an **Allen human brain**.



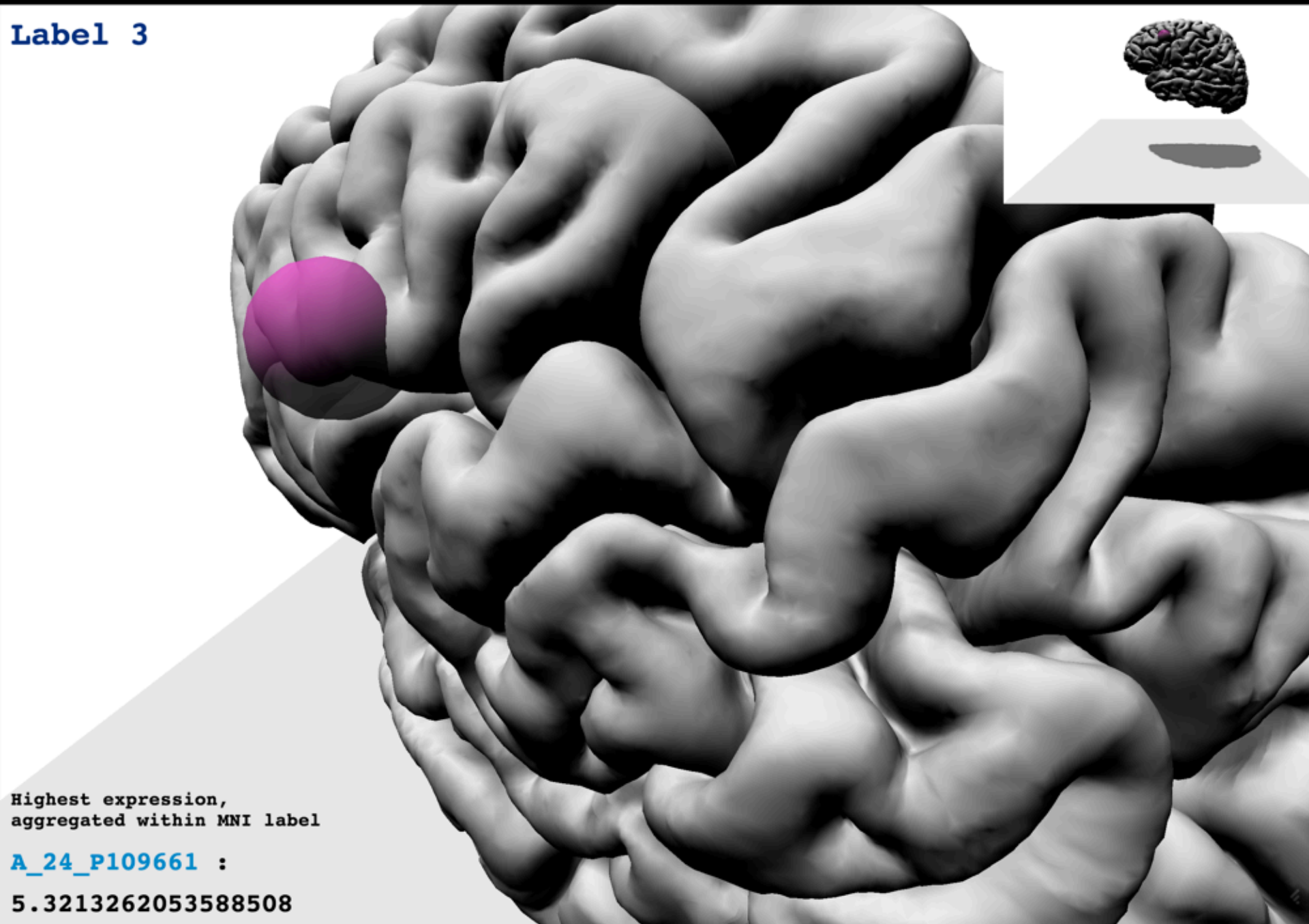
(3) Create a browser-based application to display label- or feature-specific gene expression data.



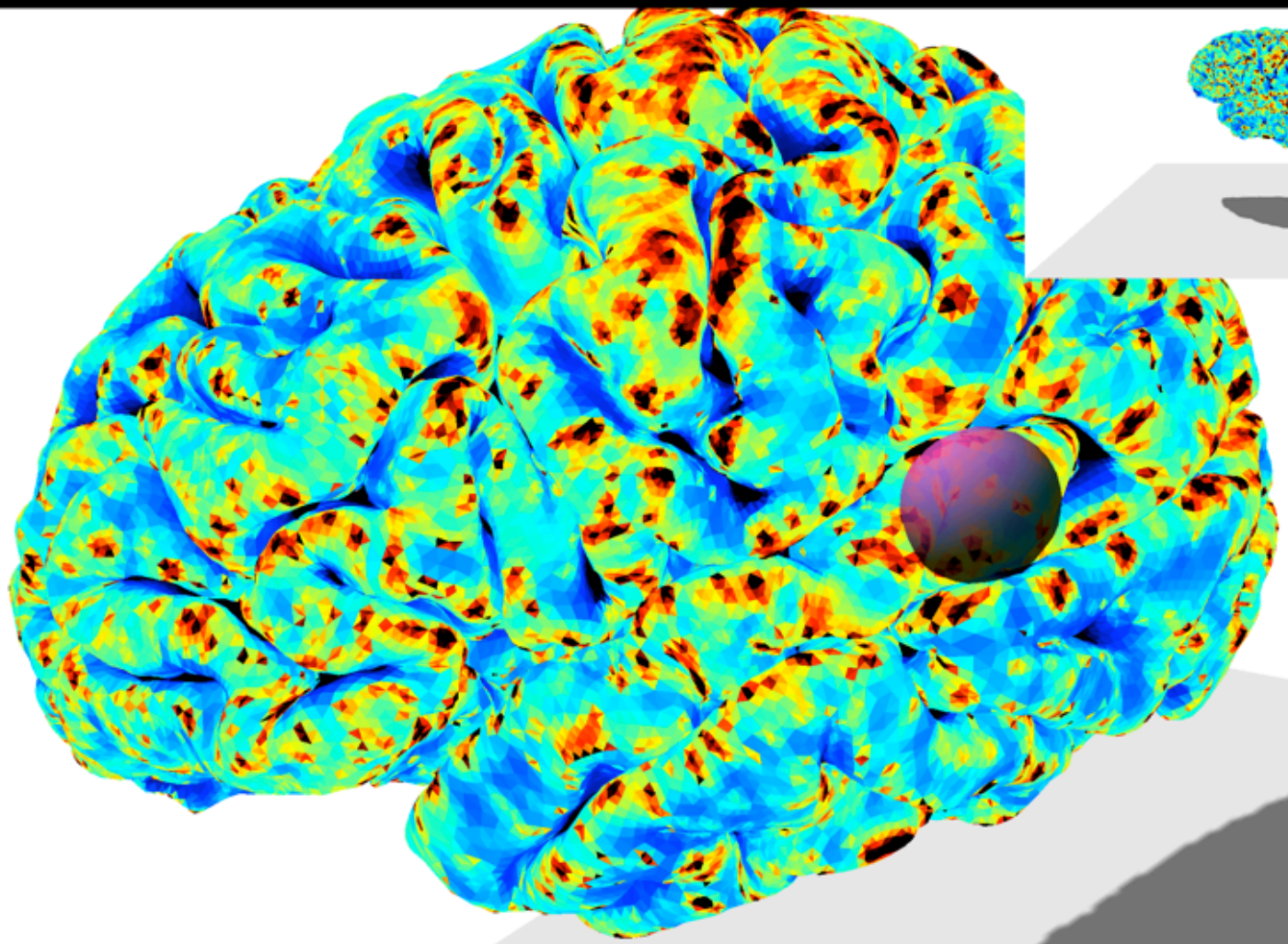


**Highest expression,
aggregated within MNI label**

:


Label 3
Highest expression,
aggregated within MNI label
A_24_P109661 :
5.3213262053588508

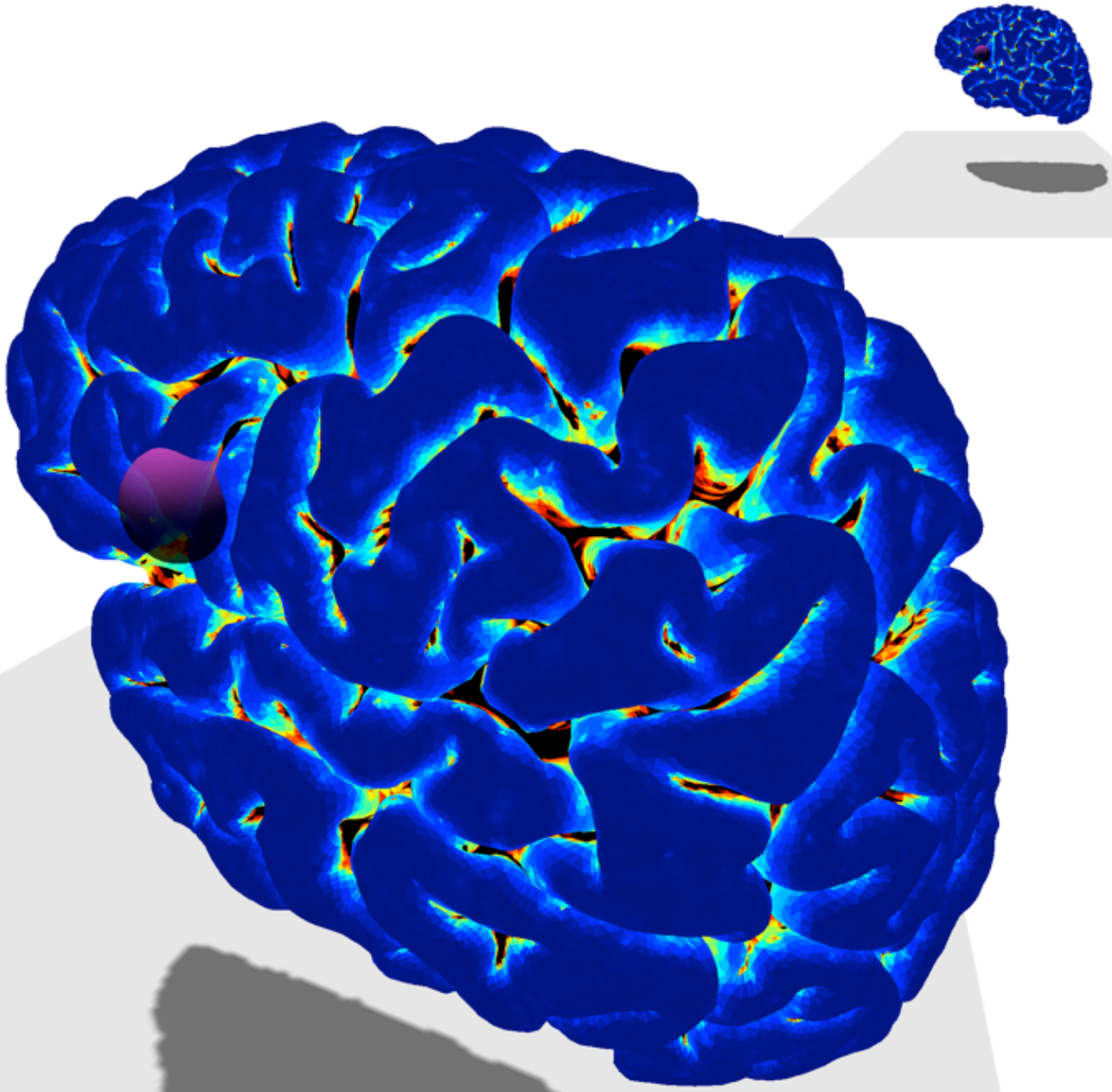
Label 30



Highest expression,
aggregated within MNI label

:

Label 18



Highest expression,
aggregated within MNI label

A_23_P169812 :

6.4810893969243741

http://bit.ly/12e5ftp

It may take some time to load - the meshes are large files (10+MB)

http://ec2-54-224-79-255.compute-1.amazonaws.com/

Built on

- Three.js (webgl)
- jquery (async requests)
- Bootstrap (layout)
- AWS ec2, deployed via fabric (python tools)

source code open and online at:

https://github.com/richstoner/ohbmdemo.git