Alzheimer's Disease Big Data DREAM Challenge #1 Launch June 2, 2014

AD Challenge Website: https://www.synapse.org/#!Synapse:syn2290704

Participants are Invited to Work On Any of the Following AD#1 Challenge Questions

- Question 1: Predict the change in cognitive scores 24 months after initial assessment
- Question 2: Predict the set of cognitively normal individuals whose biomarkers are suggestive of amyloid perturbation
- Question 3: Classify individuals into diagnostic groups using MR imaging and genetics

Challenge Overview:
Test Data

- Subsets of data from two independent studies will be used to rank participants' models on the leaderboard
  - Participants will be able to access the data with the exception of variables held out for scoring on Synapse (https://www.synapse.org/#!Synapse:syn2290704/wiki/64634)
  - Data from the Rush Alzheimer's Disease Center Religious Orders Study and Memory and Aging Project (ROS/MAP: http://www.rush.edu/rumc/page-1124115595299.html) is used to rank participants models for Questions 1 and 2
  - Data from the AddNeuroMed study, which is a part of InnoMed - a precursor of the Innovative Medicines Initiative (http://www.imi.europa.eu/) is used to rank participants models for Question 3

The AddNeuroMed Study

RUSH UNIVERSITY MEDICAL CENTER

Challenge Outcomes

- Identification of best methods in clinical predictive modeling as applied to important questions for AD
- Creation of a new community of experts from many disciplines related to AD (imaging, genetics, neurobiology, systems biology) who keep working together even after the AD#1 Challenge closes
- Lessons learned from this Challenge that guides the generation of future datasets that are powered to answer the most impactful questions in AD
- Top performing teams invited to present in the Sage Congress in Paris (April, 2015)
- Top performing teams invited to co-author a Challenge paper for submission to *Nature Neuroscience*

Alzheimers Disease Big Data DREAM Challenge 1

Synapse ID: syn2290704
DOI: (doi:10.7303/syn2290704)

Wiki Files

Pages

Alzheimers Disease Big Data DREAM Challenge 1

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Alzheimer's Disease Big Data DREAM Challenge #1
Launch: June 2, 2014
Close: September 19, 2014 (tentative)

Please see News and Updates for pertinent messages about the data

FreeSurfer

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FreeSurfer Software Suite

An open source software suite for processing and analyzing (human) brain MRI images.

- Skullstripping
- Image Registration
- Subcortical Segmentation
- Cortical Surface Reconstruction
- Cortical Segmentation
- Cortical Thickness Estimation
- Longitudinal Processing
- fMRI Analysis
- Tractography
- FreeView Visualization GUI
- and much more ...

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7T adolescent ants brain camino challenges cm-rep connectivity cortex development diffusion epilepsy evaluation function heart valves high-resolution hippocampus itk itksnap multi-atlas network neuro news normalization parcellation Paul pediatric perfusion poverty segmentation shape analysis simulation software sparse statistics stress thickness

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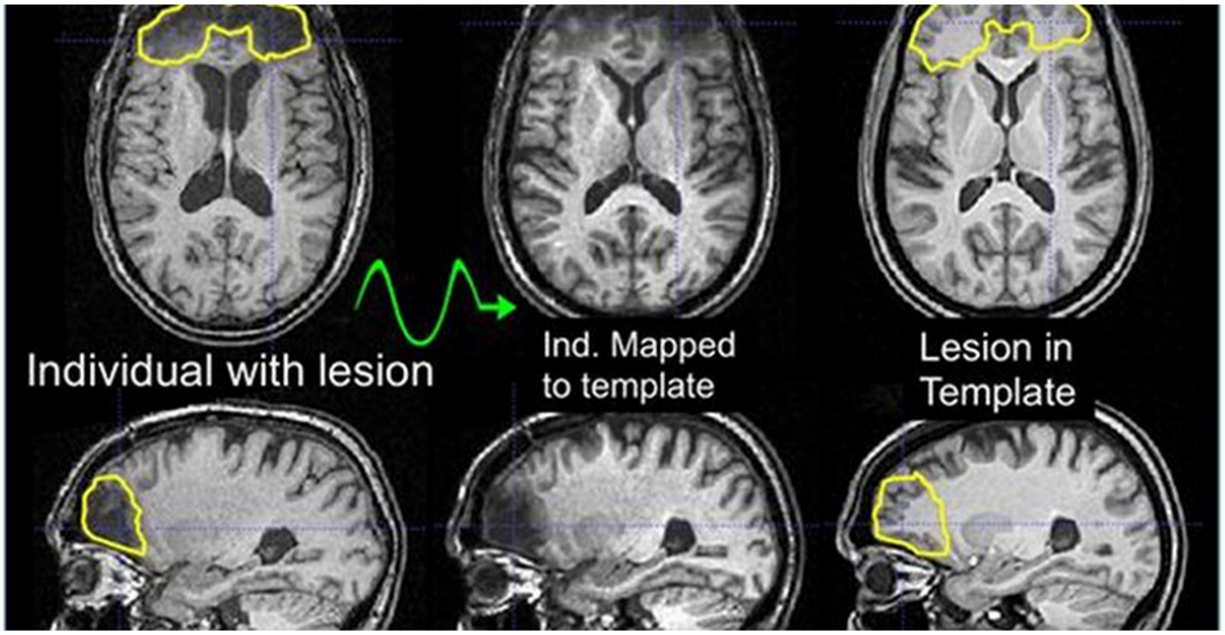
- Reproducibility of graph

ANTS



Advanced Normalization Tools (ANTs) extracts information from complex datasets that include imaging. ANTs development is led by Brian Avants and supported by other researchers and developers at PICSL and other institutions.

ANTs is open source. Code, binaries and documentation are available at the ANTs website.

Mindboggle

Software Data Papers People

Welcome to Mindboggle!

We are developing Mindboggle to improve the accuracy, precision, and reliability of automated labeling and shape analysis of human brain image data, and to promote open science by making all data, software, and documentation freely and openly available.

We are gearing up for our first official release!

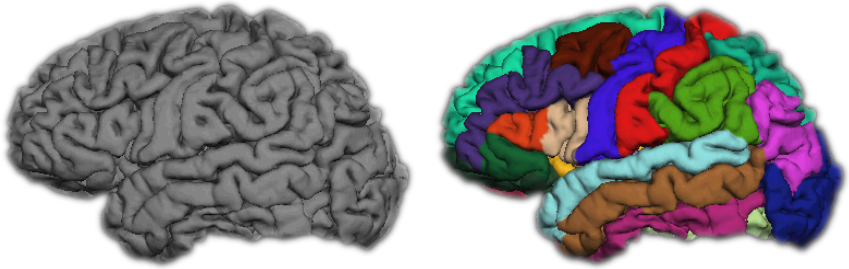
Software

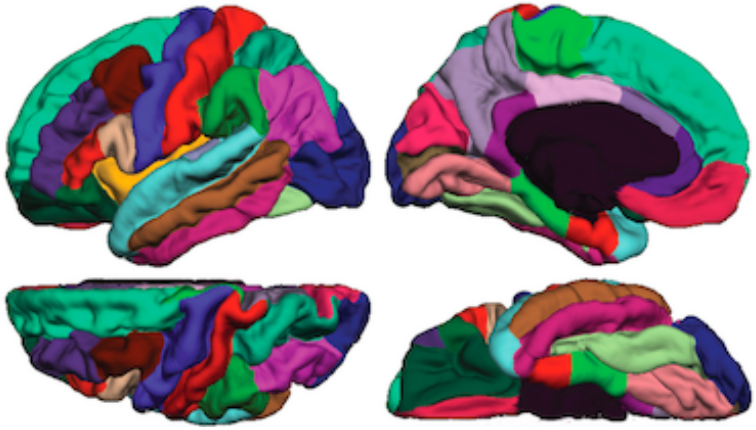
Please see the README for Mindboggle's open source, freely available python software for automated labeling, feature extraction, and shape analysis of human brain image data.

Data

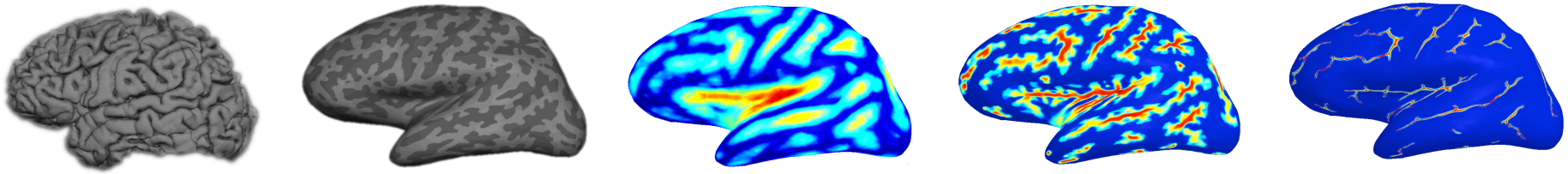
Feel free to download Mindboggle-101 atlases, templates, and individual labeled brain image data, the largest collection of publicly available, manually labeled human brains in the world!

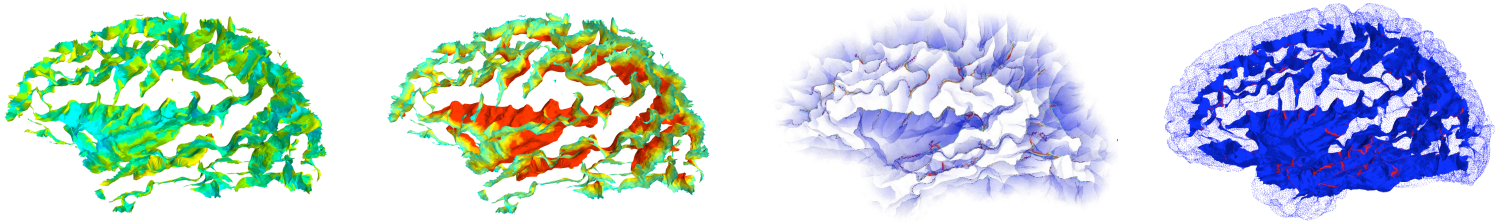
Mindboggle: labels

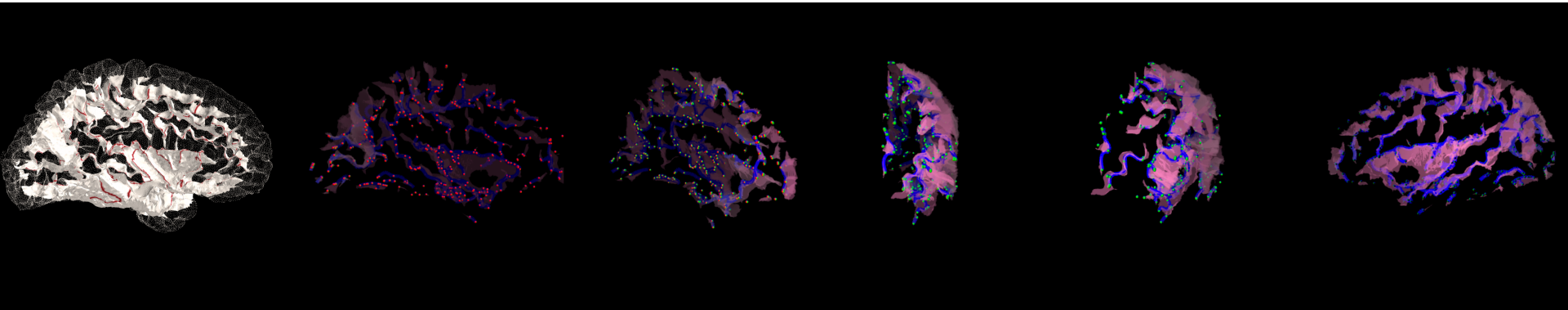




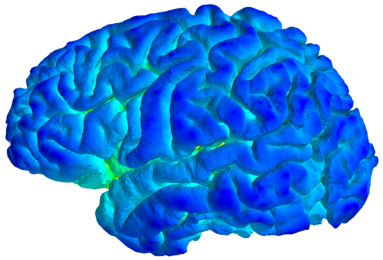
Mindboggle: features

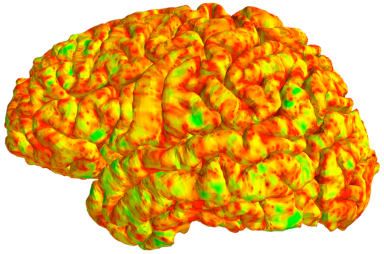






Mindboggle: shapes





For each label or feature:

- Mean curvature
- Geodesic depth
- Travel depth
- Thickness
- Surface area
- Zernike moments
- Laplace-Beltrami spectra
- ...

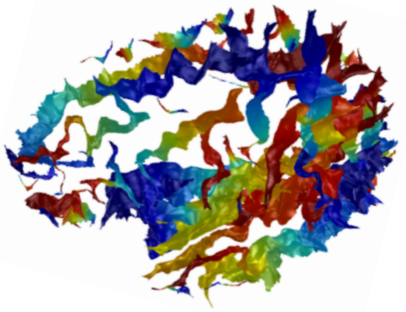


Table with the volume for every labeled brain region:

- FreeSurfer*filled*labels_volumes.csv: volume per FreeSurfer label

Table with cortical thickness information:

- FreeSurfer*filled*labels*volumes*areas_thicknesses.csv: thickness FreeSurfer label

Tables with left or right cortical surface shape statistics:

- label_shapes.csv: per-label shape statistics
- sulcus_shapes.csv: per-sulcus shape statistics

Shape measures for every vertex in each cortical surface:

- vertices.csv: per-vertex cortical surface shape measure

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