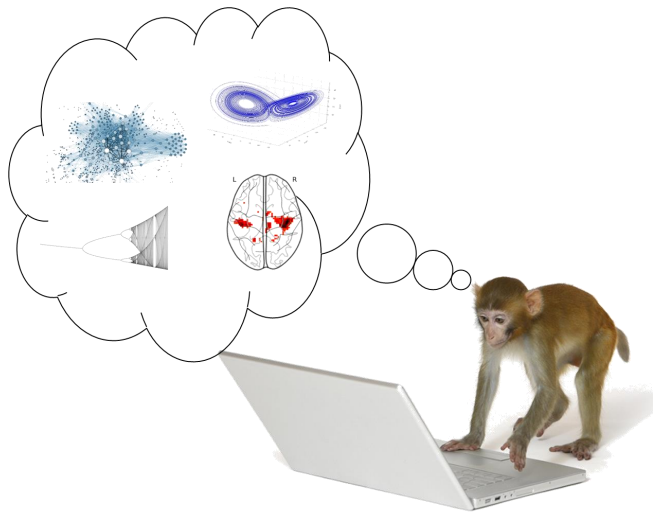




# Working with Neuroimaging Data *(for Algebraic Topologists)*



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Baycrest, Toronto





# Overview

- Open science
- Neuroimaging data repositories
- Analysis software
- File formats
- Worked example: exploring HCP data



# Open science in neuroimaging



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## Open science



From Wikipedia, the free encyclopedia

**Open science** is the movement to make scientific research, data and dissemination accessible to all levels of an inquiring society, amateur or professional. It encompasses practices such as publishing [open research](#), campaigning for [open access](#), encouraging scientists to practice [open notebook science](#), and generally making it easier to publish and communicate scientific knowledge. The European-funded project Facilitate Open Science Training for European Research (FOSTER)<sup>[2]</sup> has developed an open science taxonomy<sup>[3]</sup> as an attempt to map the open science field.

# GitHub

## Open Science Framework

A scholarly commons to connect the entire research cycle



Organization for  
Human Brain Mapping

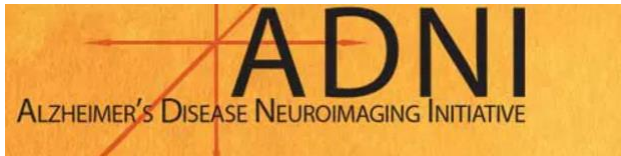
OHBM 2017

Replication Award

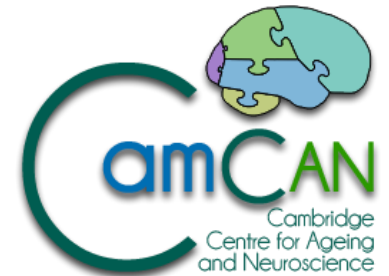
**OSJI** OPEN  
SCIENCE  
JOURNAL



# Open data repositories



neurosynth.org



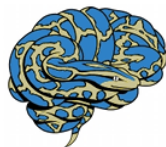


# Analysis Software

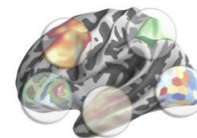
SPM



Neuroimaging in Python  
Community Site



Nipype:  
Neuroimaging in Python  
Pipelines and Interfaces



PySurfer



# File Formats

Many, many, many, many formats...

( nifti, gifti, cifti, dicom, mgh, mgz, fs surface, fs label,  
.fif, .elp, .bdf, ... )

Most common + easiest: nifti volumes

However most likely you will be working with ROI  
time series &/or connectivity matrices



# Worked example: HCP





# Resources

Wordpress site: <http://braintopology.wordpress.com>

Github repo: [https://github.com/JohnGriffiths/BIRS\\_TMinBNA\\_Workshop](https://github.com/JohnGriffiths/BIRS_TMinBNA_Workshop)

Selected HCP data zip file: *See me*

HCP data access portal: <https://db.humanconnectome.org>

my LabNotebook notes on HCP AWS S3 bucket access:

<https://johngriffiths.github.io/LabNotebook/accessing-the-hcp-s3-bucket.html>





# Conclusions

Open science developments in neuroimaging v. positive and important

Neuroimaging data & analysis pipelines are complicated & heterogenous

Most likely will be working with ROI time series + connectivity matrices



# That's a wrap 😊

