ReproNim Training Workshop Syllabus

Purpose:

An increasing body of evidence point to some issues in reproducibility in biomedical or life sciences. The issue of lack of reproducibility has been now described in several scientific domains and for several years, raising concerns in the scientific community. ReproNim has developed a curriculum (http://www.reproducibleimaging.org/#training) that will give the students the information, tools and practices to perform repeatable and efficient research and a map of where to find the resources for deeper practical training.

This training workshop will introduce material on the critical aspects of reproducible brain imaging and will orient attendees using a hands on and practical experience to conduct neuroimaging analyses with the next generation of tools. By the end of this course, the student will be aware of training materials and concepts necessary to perform reproducible research in neuroimaging. The student will be able to reuse these materials to conduct local workshops and training and be able to customize the training for their specific scenario.

Prerequisites:

If you are a student, postdoc or researcher in life science who directly works with neuroimaging data - or wish to work with these data, and you have some basic computational background, this training workshop is for you. For instance, you should have already done either some R, or Python, or Matlab or Shell scripting, or have used standard neuroimaging tools (SPM, FSL, Afni, FreeSurfer, etc) and be engaged in neuroimaging research projects. You should have already completed a neuroimaging analysis or know how to do one.

Logistics:

Location: George Washington University, Marvin Center, Room 402-404
https://events-venues.gwu.edu/meeting-rooms

Dates: November 10-11, 2017.

How to register: https://tinyurl.com/repronim-sfn17

Costs: Free - but space is limited - please apply for approval.

Schedule:

Friday November 10th:

8:30-9am: Introduction to the course and participants “setup”
9am-10:45: Reproducibility Basics (Module 0)
10:45-11am : Coffee break
11am-12:45 : FAIR data (Module 1)
12:45-2pm : Lunch+coffee
2pm-3:45: Data Processing (Module 2)
3:45-4pm: coffee break
4pm-5:45pm: Statistics for reproducible analyses (Module 3)
5:45-6:15: Questions and answers and feedback session

Saturday November 11th:

9am-12pm: The Re-executable Micro Publication Challenge
During this time, we will propose a small challenge around producing an entirely re-executable neuroimaging analysis from fetching data to producing statistical results. This will also be a time with close interactions with neuroimaging experts in data handling and analysis.
12pm-12:30: Closing session: feedback and future: “become a trainer”.

Weekly online office hours will be held prior to the workshop. Registered attendees will receive information via email.

Modules:

Module 0 - Reproducibility Basics: Friday Nov. 10. 9am-10:45am.

This module guides through three somewhat independent topics, which are in the heart of establishing and efficiently using common generic resources: command line shell, version control systems (for code and data), and distribution package managers. Gaining additional skills in any of those topics could help you to not only become more efficient in your day-to-day research activities, but also would lay foundation in establishing habits to make your work actually more reproducible.

Module 1 - FAIR Data: Friday Nov. 10. 11am-12:45.

This module provides an overview of strategies for making research outputs available through the web, with an emphasis on data. It introduces concepts such persistent identifiers, linked data, the semantic web and the FAIR principles. It is designed for those with little to no familiarity with these concepts. More technical discussions can be found in the reference materials.

Module 2 - Data Processing: Friday Nov. 10. 2pm-3:45pm.

This module teaches you to perform reproducible analysis, how to preserve the information, and how to share data and code with others. We will show an example framework for reproducible analysis, how to annotate, harmonize, clean, and version brain imaging data, how to create and maintain reproducible computational environments for analysis and use dataflow tools to capture provenance and perform efficient analyses (docker) and other tools.

Module 3 - Statistics: Saturday 9am-10:45

The goal of this module is to teach brain imagers about the statistical aspects of reproducibility. This module should give you a critical eye on most of the current literature and the knowledge to do solid work, understand exactly what is a p-value and its limitation to represent evidence for results, practical notion of power and associated tools, etc.

Instructors: J. Bates, S. Ghosh, J. Grethe, Y. Halchenko, C. Haselgrove, S. Hodge, D. Jarecka, D. Keator, D. Kennedy, M. Martone, N. Nichols, S. Padhy, JB Poline, N. Preuss, M. Travers

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