

How to Write a Re-executable Publication

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1162

Educational Course - Half Day (4 hours)

SEC Centre

Room: Alsh

There are some who would say we face a crisis: Much research money has been spent, yet there is little return on this investment in the improvement of outcomes for subjects, particularly in the areas of mental health diagnosis, prognosis and outcomes. Much gets published, but little turns into generalized, useful, and actionable findings. The investment in infrastructure has already been made: there are ample data, results and software sharing infrastructures available. The research practitioners now must take up this issue, and amend the way research is performed and published with an eye to supporting the assessment of the generalizability of the findings that get published.

Objective

- * Reasons for re-executable publications
- * How to containerize your workflows
- * How to associate linked “data” (raw data, processing workflow, statistical workflow, results) for inclusion in publications.

Target Audience

Anyone who performs neuroimaging data analysis supporting publication of research results.

Presentations

Re-Executable Publications: What are they and Why should I write one?

This presentation will address the following objectives: To make the student aware of the issue of reproducibility in the larger context of scientific advancement of knowledge; To examine the interactions between the spectrum of reproducibility and the spectrum of generalizability of research findings; To identify some of the challenges involved in recording and reporting computationally intensive research experiments to others, particularly in publications; To

be introduced to a hybrid model of publication, the ReproPub, that takes both traditional and computationally intensive research processes into account, and supplements text with digitally linked experimental specifications.

Presenter

Julie Bates, University of Massachusetts Medical School Worcester, MA
United States

Introduction to Container Technologies

This presentation will address the following objectives: Present the motivation behind the container technologies; Compare various container software: Docker and Singularity; Give examples of Docker and Singularity usage; Explain how to use Neurodocker and Neurodebian to create a customized image for Docker and Singularity.

Presenter

Dorota Jarecka, Massachusetts Institute of Technology Cambridge, MA
United States

Containerizing Workflows

In this presentation attendees will learn how to take a current workflow and use container technologies to share the workflow and its environment. At the end of this lecture, attendees should

- * Know the tools to containerize a specific workflow
- * Know how to choose a specific technology and the associated challenges associated with sharing a container
- * Know how to mitigate these challenges
- * Know how to share or find and get a specific container for a given processing goal

Presenter

Peer Herholz, McConnell Brain Imaging Centre, The Neuro (Montreal Neurological Institute-Hospital)
McConnell Brain Imaging Centre, The Neuro (Montreal Neurological Institute-Hospital)
Montreal, Quebec
Canada

Getting/Sharing Data and Workflows

In this presentation, attendees will be shown a variety of tools used to share data and workflows. In particular :

- * A reminder of the ethical challenges and solutions to ethically share data
- * A review of different solutions and their pros and cons to share datasets after anonymization and defacing
- * A review of different solutions and their pros and cons to share workflows

Presenter

Stephan Heunis, Forschungszentrum Jülich Jülich, Jülich
Germany

Learn by Doing: An Example from the ENIGMA Consortium

In this presentation we will examine an example publication from the ENIGMA consortium. We will review what data, workflow and results were generated as part of the analysis, and we will, as a hands on exercise, assemble the necessary workflow so that the student can add their own data to a pre-existing ENIGMA result.

Presenter

Neda Jahanshad, PhD, University of Southern California Marina del Rey, CA
United States

Conclusion and Perspective Regarding Re-Executable Publications

In this talk, attendees will learn the key ideas on what the community can do to produce more re-executable articles in the future and how to adapt the academic incentives for that purpose. In particular, an analysis of the key steps that can be taken at the individual and community levels as well as the tools necessary generalizing re-executable publications will be presented.

Presenter

Stephen Strother, University of Toronto Toronto, Ontario
Canada
