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Example Github repo:

Reproducible Neuroimaging: A Goal Not Yet Reached

Keywords: Neuroscience, fMRI, Reproducibility, Coding Best Practices

Birds-eye view

- Computational reproducibility is the ability for independent researchers to replicate results using the same data and code (Peng, 2011, *Science)*
- COBIDAS Best Practices in Neuroimaging includes the public sharing of code used for preprocessing and analysis (Nichols et al., 2017, *Nature*)
- We surveyed 50 papers published in 2023 on task fMRI and found that only 22% made their code publicly available, meaning that most recently published papers in neuroimaging are not computationally reproducible
- We have collected best practices from the literature, presented as the Reproducible Neuroimaging Workflow
- Reproducible neuroimaging is translatable neuroimaging

More about Ruben Krueger

- Data Analyst at Brain Stimulation Lab
- B.S. Computer Science / former software engineer
- Research interests include TMS, fMRI, translational psychiatry, and reproducible science

Stanford Data Science

Brain Stimulation Lab

Reproducible Neuroimaging: the Goal and Current Problems

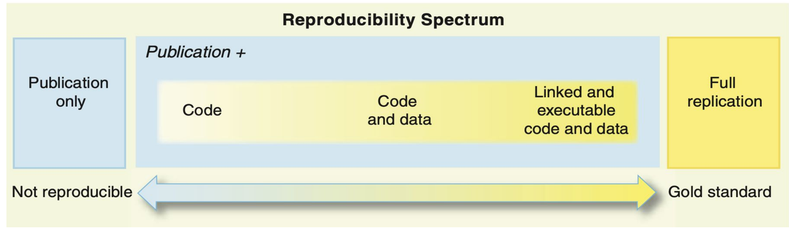


Figure 1: The Reproducibility Spectrum (Peng, 2011)

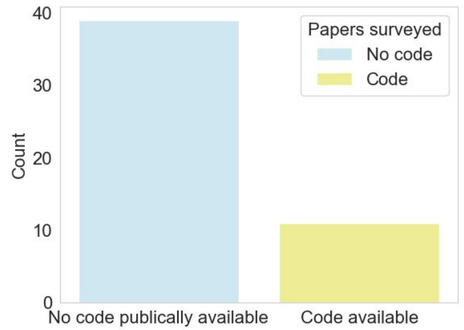
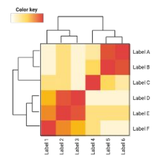


Figure 2: A survey of recently published neuroimaging papers

The Reproducible Neuroimaging Workflow

1. Create private git repository
2. Write preprocessing, analysis, and visualization code in git repository
3. Publish results
4. Make code repository public, allowing other researchers to reproduce results



What?

Code used for preprocessing, analysis, and visualization

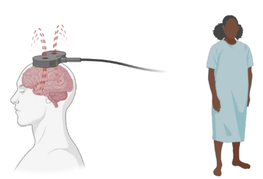
Where?

Public repositories on GitHub or Open Science Foundation

How?

Version control systems like git and/or Dockerization of pipelines

Why?



Reproducible science, resulting in more treatments and better patient outcomes