Enhancing Visibility and Impact of Research
IEEE Xplore and Code Ocean

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Repeat – Replicate – Reproduce – Reuse Research

DEFEND
Can I repeat my method?
- same experiment, set up, lab

CERTIFY
Can I replicate your method?
- same experiment, set up, independent lab
  (a window before decay sets in ...)

COMPARE
Can I reproduce my results using your method or your results using my method?
- variations on experiment, set up, lab

TRANSFER
Can I reuse your results/method in my research?
- different experiment

Experimentation

Minimum necessary condition for a finding to be believable and informative

Innovation & Impact

Image Source:
http://www.slideshare.net/carolegoble/open-sciencemcrgoble2015
Computational Reproducibility in Publishing

- Researchers, funders, publishers and governments
  - Government / Agency funding mandates
  - Open science (open data, open code, open workflows) initiatives taking center stage
- **Data and code** are becoming **citable research output**

Peng (2011), Science
• Even when using exactly the same pipeline and the same data, slight variations across computers can lead to irreproducibility.

• The solution: provide not only the data and the software, but also the complete pre-configured execution environment.”
Sharing Software and Data

- Code Repositories
  - GitLab
  - GitHub
- Computational Reproducibility Platforms
- Algorithm Marketplaces
  - CODE OCEAN
  - ALGORUN
- Packaging / Scripting
- Data Repositories
  - figshare
  - Dataverse Project
- Interactive Computational Notebooks
  - Jupyter
  - Beaker
  - R Markdown
  - Apache Zeppelin
- Code / Data Sharing Platforms Landscape
- Journals - Code + Manuscript
  - Elsevier SoftwareX
  - Insight Journal
  - ReScience

Domain-Specific
Reproducing Research can be Hard....

1. Find the code
2. Acquire the right hardware
3. Set up the environment
4. Import the right files
5. Installing all dependencies...packages, versions, OS etc.
6. Errors.. Debugging.. Errors.. Debugging
7. Run
8. Results
IEEE is working with Code Ocean to help authors enhance visibility and impact of their research by sharing related code (software)

**Code Ocean** is a cloud-based computational reproducibility platform that is fully integrated with IEEE Xplore

- Upload Code (Software) implementing algorithms in articles
- Discover, Browse, and Run code
- Modify, experiment with Code, and build on research without any other setup or software license

https://codeocean.com/signup/ieee
Unique Icon on IEEE Xplore for Articles with Code
On IEEE Xplore

1. Click Run
2. View Results
Upload Once, Run Always

With IEEE Xplore / Code Ocean, authors can preserve their code, data, and the complete environment, so the code always runs

- **Upload is Straightforward**
  - Import from GitHub or simply drag & drop files
  - Specify libraries
  - Get your code running

- **Publish when ready**
  - Publish code to make it available to everyone or just keep it private
  - **Author maintains ownership and copyright of the code**

- **Avoid Headaches**
  - No more incompatible library versions
  - **Your code always works**
  - No more answering the same questions about your code
Code Ocean is now Integrated into the IEEE Publishing Workflow

- **Submission**
  - Manuscript management
  - Information to Authors - Author Center
  - Society / Transaction pages
  - Conference paper submission sites

- **Acceptance**
  - Author Gateway
  - Conference final manuscript submission

- **Copyright Transfer**
  - eCF application to transfer copyright

- **Publication**
  - Search results
  - Article page
  - Xplore website