Open Science and Research in the Legal Field

A summary of what I learned as a fellow in the Roots for Resilience program and how I think the legal field can embrace the concepts of open science.

What is the Roots for Resilience Program?

- The Roots for Resilience Program provides training and support to select graduate students on open, reproducible science and computational infrastructure tools to enhance research focused on resiliency in the environment.

- The Roots for Resilience research fellowship program in data science is led by the Arizona Institute for Resilience (AIR), CyVerse, and the Data Science Institute (DSI).

- During the program, participants meet 2x/week, once as a cohort, and a second time to attend an instructional class facilitated by CyVerse called Foundational Open Science Skills.

What is “Open Science”?

"Open Science is a collaborative and transparent approach to scientific research that emphasizes the accessibility, sharing, and reproducibility of data, methodologies, and findings to foster innovation and inclusivity" - ChatGPT

I believe open science, in the most general sense, encourages collaboration. More specifically, it’s values promote idea sharing and aim to create an opportunity for interdisciplinary research and innovation free of the heavy administrative costs, or steep knowledge barriers typically associated with conducting research.

Pillars of Open Science

- **Open Access Publications** – makes research information available to readers at no cost.
- **Open Data** – data that can be freely used, re-used and redistributed by anyone - subject only, at most, to the requirement to attribute and sharealike.
- **Open Educational Resources** – materials in any format and medium that reside in the public domain or are under copyright that have been released under an open license, that permit no-cost access, use, adaptation and redistribution by others.
- **Open Methodology** – An open methodology is simply one which has been described in sufficient detail to allow other researchers to repeat the work and apply it elsewhere.
- **Open Peer Review** – this is a bit of an umbrella term, but it may include making reviewer and author identities open, publishing review reports and enabling greater participation in the peer review process.
- **Open Source Software** – code that is designed to be publicly accessible.

Potential Benefits of Incorporating Open Science in the Legal Field

Transparency & Accountability: Provides open access to empirical legal research which can better ensure verifiable sources and clear reasoning in legal decisions.

Improved Collaboration: Fosters cross-disciplinary interaction and global sharing of legal insights.

Accelerated Innovation: Speeds up the dissemination of new legal knowledge and encourages legal tech development.

More Accessible to the Public: Empowers non-experts and promotes legal literacy, making laws and precedents more accessible to the public.

Replicability: Enhances evidence-based research by ensuring replicable, verifiable findings.

Legal Reform: Informs policy-making and facilitates cross-border legal reforms (across states, and even potentially different countries).

More Accessible, and therefore More Equitable: Democratizes legal knowledge, ensuring access for under-resourced groups.

Reduction in Research Costs: Reduces research costs and supports shared legal tools and databases.

What topics does FOSS cover?

1. Overview of Open Science
2. Data Management
3. Documentation and Communication
4. How to Talk to Computers
5. Version Control
6. Reproducibility
    a. Software Environments
    b. Containers
        i. Running Containers
        ii. Building Containers
7. Remote Computing
    a. CyVerse
    b. HPC

My Highlights

Welcome! My name is Brielle and I am a third-year J.D. student at the James E. Rogers College of Law. I am passionate about leadership, open science, and exploring creative solutions in the legal field. This website is a compilation of resources and insights I've developed to help others integrate open science practices into their work, especially in the legal field.

About Me

Key Concepts in Version Control with GitHub

1. **Repository (Repo):**
2. A repository is like a folder that contains all your project files and the history of changes made to them.
3. You can create a repository locally on your computer or host it online on GitHub.
4. **Commits:**
5. A commit is a snapshot of your project at a specific moment in time. It represents the changes you've made to the files since the last commit.
6. Commits include a message describing the changes, making it easier to track progress.
7. **Branches:**
8. Branches allow you to work on different versions of your project simultaneously.
9. For example, you can create a branch for adding new features without affecting the main branch (the production-ready version of your project).

Part I: Some of the things I learned how to use...

- **GitHub**: a web based platform for developers.
- **Markdown**: a coding language that allows users to add formatting to plain text documents without using HTML tags or a formal text editors.
- **Text Editors**: a computer program that allows users to create, edit, and view plain text files, primarily focused on manipulating text without advanced formatting options, often used for coding and basic document editing.
- **The Command Line**: a text-based program that allows a user to interact with their computer's operating system using a keyboard.
- **LLMs**: large language models
    - Prompt Writing

Part II: Creating a personal website…

Using the skills from the R4R program, I learned how to create a personal website.

Some things that stood out to me:

- It's free!
- Not as complicated as you might expect.
- Extensive coding experience is not required.
- Using Chat GPT or other LLMs can do the heavy lifting.
- Among many other things, a website in GitHub can help (1) showcase your research, (2) increase it's accessibility, and (3) give you a platform to keep all the research and/or published articles in one place.
- My website.
- You can start from scratch, or use a template like this one (created for use by CyVerse).

UA Resources I found particularly important to share:

- **DMP Tool**: a UA resource, free to those affiliated with the university, to assist researchers in creating a Data Management Plan.
    - Having a well organized DMP increases the chances of obtaining funding for research.
- **UA Research Data Center**: each faculty member is eligible for a free standard allocation of CPU time and storage space.
    - Can mitigate the cost of running programs and/or combing through large data sets.
- **CyVerse** (see next slide)

CyVerse

The open science workspace for collaborative data-driven discovery.

- Vision: Transforming Science through Data-Driven Discovery
- Mission: To design, deploy, and expand national Cyberinfrastructure for research, and to train scientists in its use.
- Cyverse is completely Free for University of Arizona students, staff, and faculty.
- CyVerse Self Guided Course
    - Know the background of the CyVerse project
    - Understand the basic capabilities of the CyVerse platform
    - Understand the capabilities and limitations of the major international installations (US/UK/Austria)

The benefits of participating in R4R

- Provides an overview of free resources as well as the wealth of UA Resources available to student researchers and faculty.
- Teaches participants how to navigate platforms like GitHub and Atom to view, use, edit, and repurpose other creators' code.
- It is a great interdisciplinary networking opportunity.
- Provides a comprehensive understanding of the concepts and terminology implicated in software development and data sharing (to the extent I've encountered them in IP Litigation so far!)
- Participants gain Insight (from cohort peers) into the research processes and, importantly, their differences across disciplines ranging from public health, architecture, and astrophysics to genetics, economics, and environmental public health and data science.

The Future for R4R and the College of Law

- Future potential applicants may be law students participating in the TechLaw program.
- College of Law faculty currently conducting empirical research could (and should) work with current or previous R4R fellows to assist them in taking advantage of the resources that are (1) available to them through the University, and (2) available free of charge through open source platforms such as github, atom, docker and the like.

QUESTIONS?