Roots for Resilience Research Assistantship Program

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Research Innovation and Impact

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Data Science at the University of Arizona

Data Science coursework is very distributed between departments

Data Science Academy (in formation) -- building a curriculum path

Data Science Institute creates data science teams and providing training and support that supplements research and established coursework

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The Data Science Institute is a research institute connecting computational and informatics researchers with those in domain sciences to facilitate and foster data-driven, transdisciplinary research.

Goals:
- Develop data science teams
- Foster collaborations with data scientists and researchers
- Retaining data science expertise
- Promoting data science training
- Solving data driven challenges

Data Science Institute

Student Researcher Programs

Data Science Ambassadors (PhD)

Focuses on domain knowledge and data science expertise at the graduate student levels. Serves as a resource within their colleges to assist with data science consultations/referrals and/or training and outreach. Students receive a $1000 stipend for an academic year commitment.

Data Science Fellows (Postdoc)

Fellows receive intensive training and mentorship custom to their expertise and area of research. Fellows receive 50% annual salary support in exchange for working in the data science community, providing outreach, project consulting, and sharing their expertise.

Roots for Resilience Research Assistantships

Co-sponsored by AIR, CyVerse and the Data Science Institute. The program trains students in the use of open science and computational infrastructure such as CyVerse to apply data science tools to their dissertation research. Requires presentation back to the student's dept on applications and tools; aimed at fostering new research in data sci and Resilience.

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An Open Science Workspace for Collaborative Data-driven Discovery
https://cyverse.org

Provides (life) scientists with computational infrastructure to handle huge datasets and complex analyses
- Open, free, collaborative computation spaces
- Data storage, bioinformatics tools, data visualization, interactive analyses, cloud services, APIs, and more

Foundational Open Science Skills workshop -- https://cyverse.org/fossonline

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Roots for Resilience Research Assistantships

Co-Led Program:

- Data Science Institute, CyVerse and the Arizona Institute for Resilience

Objectives:

- Trains students in the use of <u>applied</u> open science and computational infrastructure
- Increase the department's data science capacity
- Focus on <u>applying and experimenting</u> with tools supporting personal research activities within their research lab/dept
- Fostering new interdisciplinary research partnerships
- Training graduate students as department-level ambassadors of information exchange

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Overview

- 12-15 students (2-3 from CS, Eng, Math/Stats)

- Students participate in the CyVerse FOSS Workshop (meets 1x per week)

- Cohort meets biweekly to reinforce applications and tools discussed in FOSS

- Discussions branch out with addt'l topics/discussions

- Concludes with a presentation to the home department faculty, in consultation with advising/mentoring prof

- Social engagements for building community

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Sample Topics

Concepts

- Open Science
- Reproducibility
- Open Access
- Open Source
- FAIR Principles
- CARE Principles
- Collaborative Org Structures
- Data Science Teams
- Project Documentation
- Data Management
- Data Pipelines
- Metadata
- Data Repositories
- Disciplines do things differently

Tools

- DMPTool / DMP Wizard
- GitHub
- Open Science Framework
- FigShare and Data Repositories
- Stack Overflow
- Python vs Rstudio
- Computer Sci, Software Engineering, Data Engineering

Other Skills

- Communication
    - across disciplines
    - across academic levels
- Presentation Skills
- Building Community
- Publication
- Intellectual Property – Copyrights

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Application is challenging

- "But my lab/prof doesn't use these tools or do it this way…"

- "I've only used X tool in this one way; I didn't know I could do this…"

- "Reproducibility? Doesn't that come AFTER publication?"

- "But they don't use the same terminology" or "But I don't kno whow to get involved…"

- "But everybody does science this way…right!?!"

Student Comments

"I have just begun my PhD career as a first year student at U of A and thanks to the continued educational support like yours; I can already report that my academics is off to a 'first-rate start' with my hands-on learning experience on Data Science for the first time."

"I'm very grateful for the opportunity to participate in the Roots for Resilience program! I thoroughly enjoyed gaining many, many new skills to apply and help improve my projects, working with fellow grad students doing such great work, and sharing back with the SNRE community."

"It was my pleasure to be a part of the Roots for Resilience program. I have learned a lot, connected to other researchers and started new projects all because of this program. I'm very thankful to all of you for the great opportunity…"

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QUESTIONS & DISCUSSION

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