Nicole **Brewer**

RESEARCH SOFTWARE ENGINEER | GRADUATE RESEARCH ASSISTANT

Arizona State University, Tempe, AZ

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Education

Arizona State University   *Tempe, AZ*

PHD COMPUTATIONAL HISTORY AND PHILOSOPHY OF SCIENCE   *Expected May 2027*

- Using methods from digital humanities, complex adaptive systems science, and high performance computing to better understand reproducibility and other standards throughout the history of science

Purdue Univeristy   *West Lafayette, IN*

BS MATHEMATICS WITH COMPUTER SCIENCE   *December 2018*

- Implemented and ran the KMP string matching algorithm in parallel to create a combinatorial game theory set

Grants, Fellowhips, and Awards

2022	School of Life Science Fellowship, Arizona State University
2021	UPSS Delegate, Philosophy of Science Biennial Meeting
2020	Young Professional of the Year, Science Gateways Community Institute
2018	Travel Grant, XSEDE
2018	Phil Andrews Award, Practice and Experience in Advanced Research Computing Conference

Publications

1. Brewer, N., Campbell, R., Kalyanam, R., Luk, K. I., Song, C. X., & Zhao, L. (2022). Benefits and limitations of jupyter-based scientific web applications. *2022 IEEE 18th International Conference on eScience (eScience)*.

2. Brewer, N., Kim, H., Li, C., Anderson, H., Lanum, J., Cheoh, J., Hillery, B., & Overmyer, T. (2019). Student cluster competition 2018, team ada six of purdue university: Reproducing extreme scale multi-physics simulations of tsunamigenic 2004 sumatra megathrust earthquake on intel skylake architecture. *Parallel Computing*, *90*, 102565. `https://doi.org/10.1016/j.parco.2019.102565`

Presentations

Apr 2022 **Research Software Engineering** (Interviewee), Hello PhD, Podcast.

Oct 2021 **How to Recruit and Sustain a Diverse and Inclusive Workforce: A Case Study** (Invited Panelist), International RSE Day, Virtual.

July 2021 **Leveraging Traits for Highly Interactive Computational Tools in Jupyter** (Video Presentation), Gateways 2021, Virtual.

June 2018 **Classification of Periodicity in Subtraction Game Sequences** (Poster), PEARC 2018, Pittsburg, PA.

Professional Experience

ITaP Research Computing   *Purdue University*

RESEARCH SOFTWARE ENGINEER   *Feb 2019 - Present*

- Implemented a highly interactive, Jupyter-based, GUI wrapper for power analysis software in order to expand the audience and ease of use of a rich set of computational functions via a user-friendly interface
- Facilitated software design, the implementation of best practices, and internal tool development, and lab documentation to improve the overall sustainability of lab software
- Transform disparate data acquisition and processing scripts into modular classes to be reused for scientific workflows

Aptiv   *West Lafayette, IN*

SOFTWARE VERIFICATION ENGINEER   *Nov 2017 – Nov 2018*

- Developed comprehensive Unit Test projects that utilized CAN bus protocol communications to verify automotive controller hardware

Research Experience

Research Assistant
CENTER FOR BIOLOGY AND SOCIETY, ARIZONA STATE UNIVERSITY _Aug 2022 - Present_
- Advisor: Manfred Laubichler

Student Cluster Competition Team
RESEARCH COMPUTING, PURDUE UNIVERSITY _June 2018 - Dec 2018_
- Built a small cluster and applied optimization techniques in a non-stop, 48-hour challenge at the SC18 conference
- Compiled a scienfitic application from an accepted paper from the prior year's Technical Program and interacted directly with the paper's authors to reproduce specific results and conclusions from the paper

CSoI Channels Scholar REU
CENTER FOR SCIENCE OF INFORMATION, NSF STC _Jan 2016 - June 2017_
- Utilized HPC clusters to efficiently create large data sets pertaining to combinatorial game theory
- Analyzed batching strategies of parallel computation to efficiently detect an unknown length of repeating sequences in long strings
- Developed a command line interface and file managment system in Python to prevent human error and enhance the usability of codebase upon inheritance

Service

Research Software Engineering Association
United States
STEERING COMMITTEE MEMBER _Jan 2022 - Present_
- Develop the organization to support RSE's, build an inclusive community community, and advocate for the role of RSEs in research. Led meetings and organized events for the diversity, equity, and inclusion working group.

ITaP Research Computing
Purdue University
CO-CHAIR OF WOMEN IN HIGH PERFORMANCE COMPUTING _June 2020 - May 2022_
- Established the Long Tales of Science podcast to continute to improve visibility of women in HPC in spite of discontinuing in-person events in the wake of the COVID-19 pandemic

Conference Activity

Committee Member
Dallas, TX
REPRODUCIBILITY CHALLENGE _SC 2022_

Training

San Diego Supercomputer Center
Virtual
SDSC SUMMER INSTITUTE _May 2020_
- Machine learning in R, big data with Spark, parallel programming with Python, and scientific visualization

Krannert Executive Education
West Lafayette, IN
APPLIED MANAGEMENT PRINCIPLES _July 2019_
- Purdue's "mini-MBA" covering accounting, finance, strategy, marketing, negotiations & problem solving, and entrepreneurial skills essential to effective laboratory and research project managment

Teaching Experience

Object Oriented Programming
Purdue Univeristy
UNDERGRADUATE TEACHING ASSISTANT _Aug 2015 - May 2016_

Mentorship and Outreach

Student Cluster Competition
_SC 2019_
STAFF ADVISOR _Aug - Nov 2019_
- Advised students in preparing for the competition I had participated in a year prior

Science Gateways Community Institute Hackathon *PEARC 2019*

MENTOR *June 2019*

- Supported students participating in the three day conference hackathon

Mentors for Aspiring Girls in Computing *Purdue University*

NEAR-PEER MENTOR *Aug 2018 - Dec 2018*

- Led hands-on activities to teach computer science concepts to local middle and high school students in order to improve the recruitment and retention of young women in technology careers

Extracurricular Leadership

| Aug 2016 - Aug 2017 | Vice President | Purdue University Triathlon Club |
| Aug 2015 - Aug 2016 | Social Media Manager | Purdue University Triathlon Club |