

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 University

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, Fellowships, and Awards

2022	School of Life Science Fellowship	Arizona State University
PSA		
Biennial Meeting	UPSS Delegate	Philosophy of Science Association
2021		
Gateways	Young Professional of the Year	Science Gateways Community Institute
2020		
PEARC2018Travel Grant		XSEDE Practice and Experience in Advanced Research Computing Conference
2018	Phil Andrews Award	

Publications

- 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)*.
- 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.
<http://hellophd.com/2022/03/172-research-software-engineer/>
- Oct 2021 **How to Recruit and Sustain a Diverse and Inclusive Workforce: A Case Study** (Invited Panelist), International RSE Day, Virtual. <https://us-rse.org/events/2021/2021-10-intnl-rse-day>
- July 2021 **Leveraging Traits for Highly Interactive Computational Tools in Jupyter** (Video Presentation), Gateways 2021, Virtual. <https://doi.org/10.5281/zenodo.5570605>
- June 2018 **Classification of Periodicity in Subtraction Game Sequences** (Poster), PEARC 2018, Pittsburg, PA.

Professional Experience

ITaP Research Computing

RESEARCH SOFTWARE ENGINEER

Purdue University

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

SOFTWARE VERIFICATION ENGINEER

West Lafayette, IN

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 scientific 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

CSol 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 management system in Python to prevent human error and enhance the usability of codebase upon inheritance

Service

Research Software Engineering Association

STEERING COMMITTEE MEMBER

United States

Jan 2022 - Present

- Develop the organization to support RSE's, build an inclusive 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

CO-CHAIR OF WOMEN IN HIGH PERFORMANCE COMPUTING

Purdue University

June 2020 - May 2022

- Established the <https://www.nicole-brewer.com/long-tales-of-science/> {Long Tales of Science podcast} to continue 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

REPRODUCIBILITY CHALLENGE

Dallas, TX

SC 2022

Training

San Diego Supercomputer Center

SDSC SUMMER INSTITUTE

Virtual

May 2020

- Machine learning in R, big data with Spark, parallel programming with Python, and scientific visualization

Krannert Executive Education

APPLIED MANAGEMENT PRINCIPLES

West Lafayette, IN

July 2019

- Purdue's "mini-MBA" covering accounting, finance, strategy, marketing, negotiations & problem solving, and entrepreneurial skills essential to effective laboratory and research project management

Teaching Experience

Mentorship and Outreach

Student Cluster Competition

STAFF ADVISOR

SC 2019

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