

Nicole Brewer

RESEARCH SOFTWARE ENGINEER | GRADUATE RESEARCH ASSISTANT

Arizona State University, Tempe, AZ

🏠 nicole-brewer.com | 📧 nicole-brewer | 🌐 nicole-brewer | 🐦 catch_me_coding

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

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
- Designed a dynamic Solr schema to index and query layered geospatial and user-defined metadata
- Implemented interactions with this database in a web application in PHP and JavaScript
- Mentored students participating in semester-long internships

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

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 management

Research Experience

Purdue's Student Cluster Competition Team

SUPERCOMPUTING 2018

June 2018 - Dec 2018

- Built a small cluster and applied optimization techniques in a non-stop, 48-hour challenge at the SC 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.
- Created a data visualization to illuminate patterns and relationships among 5-dimensions for future work.

Publications

1. 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>
2. 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)*.

Honors and Awards

UPSS Delegate

TRAVEL SUPPORT FOR EARLY CAREER SCHOLARS WHO ARE CONSIDERING PURSUING PHILOSOPHY OF SCIENCE

Baltimore, MD

PSA Biennial Meeting 2021

Young Professional of the Year

HONORARIUM AWARDED FOR NOTABLE ACHIEVEMENT IN THE ADVANCEMENT OF SCIENCE GATEWAYS

Virtual

Gateways 2020

XSEDE Student Travel Grant

TRAVEL SUPPORT TO ATTEND PEARC18 AND PARTICIPATE IN THE STUDENT PROGRAM

XSEDE

PEARC2018

Phil Andrews Award

AWARDED FOR POSTER PRESENTATION OF "CLASSIFICATION OF PERIODICITY IN SUBTRACTION GAME SEQUENCES"

Pittsburgh, PA

PEARC2018

Conference Activity

Committee Member

REPRODUCIBILITY CHALLENGE

Dallas, TX

SC 2022

Conference Presentation

Leveraging Traits for Highly Interactive Computational Tools in Jupyter (Video Presentation), Gateways 2021, Virtual. <https://doi.org/10.5281/zenodo.5570605>

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

Invited Talks

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>

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 - Present

- Started a podcast to continue to improve visibility of women in spite of discontinuing in-person events in the wake of the COVID-19 pandemic

Teaching Experience

Object Oriented Programming

UNDERGRADUATE TEACHING ASSISTANT

Purdue University

Aug 2015 - May 2016

Mentorship and Outreach

Student Cluster Competition

STAFF ADVISOR

- Advised students in preparing for the competition I had participated in a year prior.

SC 2019

Aug - Nov 2019

Science Gateways Community Institute Hackathon

MENTOR

- Supported students participating in the three day hackathon.

PEARC 2019

June 2019

Mentors for Aspiring Girls in Computing

NEAR-PEER MENTOR

- 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

Purdue University

Aug 2018 - Dec 2018

Extracurricular Leadership

Purdue Triathlon Club

VICE PRESIDENT

- Led and organized callouts, executive board meetings, social media campaigns, and clothing orders.

Purdue University

Aug 2016 - Aug 2017