

Sora Cullen-Baratloo

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EDUCATION

University of Maryland

Fall 2024-Present

Ph.D Computer Science under Abhinav Bhatele, High Performance Computing

Harvey Mudd College

Graduated May 2023

B.S. Computer Science and Mathematics Joint Major | Cumulative GPA 3.904

High Distinction, Math Departmental Honor, Don Chamberlain Computer Science Research Award, National Merit Scholarship (NMSC), Dean's List first three years at HMC, Harvey S. Mudd Merit Award

Programming Languages: Python, Java, C++, JavaScript, Racket, Haskell, MATLAB

Development Tools: Git, GitHub, Docker, Google App Engine, Shell Scripting

RESEARCH EXPERIENCE

Lawrence Livermore National Lab Capstone Project

September 2022 - May 2023

Student Researcher

- Wrote Python scripts to collect, analyze, and visualize output from molecular dynamics simulations to inform when running repeated simulations ceased to be statistically necessary
- Developed a notion of distance between environments (using Principal Component Analysis) to quantify differences in simulated environments

Algorithms & Logic for Program & Quantitative Analysis (ALPAQA) Lab

Student Researcher focused on Metrinome

Summer 2020, Summer 2022

- Debugged and improved algorithms for Metrinome, a Python symbolic execution tool, to improve useability and allow it to analyze recursive functions, a key deficiency of the original version
- Analyzed data to validate correctness of Metrinome by running Klee (symbolic execution tool) on a test suite of programs, and wrote Python scripts to run tests and collect data
- Findings published twice, in ICSE-Companion 2021 and IEEE FormaliSE 2023

Student Researcher focused on Symbolic Execution/Linear Algebra

Summer 2021

- Developed and tested a new model for representing program execution paths using abstract algebra and matrices as a potential way to make symbolic execution faster
- Implemented this new model in Python and validated the correctness of the new technique

EXTRACURRICULARS

HMC Solidarity, Organizer

March 2020 - December 2021

Student group raising funds to aid students in need during COVID and assisting with general needs.

- Planned/ran fundraisers, raised \$60,000+ over several semesters to support needs of 30+ students
- Created a Python script for automatically tracking donations via Venmo's API

MCM/ICM 2021 Contest in Modeling

February 2021

Consortium for Math and its Applications (COMAP) International Math Modeling Contest (MCM/ICM)

- Conducted research about fire spread and wrote Python scripts to simulate the fires in team of 3