

Education

Harvey Mudd College

B.S. Joint Major in Computer Science and Math

May 2021

3.95 Major GPA | 3.84 Overall GPA | Dean's List: Spring 2018-Spring 2021

Selected Coursework:

Principles of Computer Science, Data Structures and Program Development, Computability and Logic, Algorithms, Advanced Topics in Algorithms, Complexity Theory, Programming Languages, Machine Learning/Information Theory/Search, Abstract Algebra, Galois Theory, Real Analysis, Functional Analysis

Research Projects

Model Counting for Array Theory

Summer 2019-present

Advisor: Lucas Bang, Harvey Mudd College

- Worked with a partner to develop the first algorithm and software tool for counting the number of solutions to logical constraints over fixed-length integer arrays
- Presented our work through a 20-minute live talk at VSTTE 2020 and a recorded video at ESEC/FSE 2020

Automated Search Synthesis via Symbolic Entropy Maximization

Spring 2020-present

Advisor: Lucas Bang, Harvey Mudd College

- Prior student work on this project had developed a general method for automatically synthesizing a procedure to solve search problem using symbolic execution leveraged information theoretic analysis
- Contributed theoretical results on the computational complexity of the problem and on the relationship between our solution and the optimal search

Domain Knowledge from Hyperparameter Selection in AlphaZero

Fall 2019-Spring 2020

Advisor: George Montañez, Harvey Mudd College

- Investigated the degree to which the generality of the AlphaZero machine learning algorithm can be attributed to the tuning of the hyperparameter α
- Constructed a toy example game that isolated its effects and through comparison of AlphaZero agents with different α values on the same task

Publications

Abtin Molavi, Thomas Schneider, Mara Downing, Lucas Bang. “MCBAT: Model Counting for Constraints over Bounded Integer Arrays.” *Proceedings of the 12th Working Conference on Verified Software: Theories, Tools, and Experiments (VSTTE 2020)*.

Abtin Molavi, Mara Downing, Thomas Schneider, Lucas Bang. “MCBAT: A Practical Tool for Model Counting Constraints on Bounded Integer Arrays.” *Proceedings of the 2020 ACM Joint Meeting on European Software Engineering Conference and Symposium on the Foundations of Software Engineering (ESEC/FSE 2020)*. Video demonstration included as part of the submission hosted here: <https://www.cs.hmc.edu/~bang/mcbat.html>

Mara Downing, **Abtin Molavi**, Lucas Bang. “Symbolic Execution + Model-Counting + Entropy Maximization = Automatic Search Synthesis.” *Proceedings of the 11th International Symposium on Games, Automata, Logics, and Formal Verification (GandALF 2020)*.

Other Activities and Leadership

Writing Center Consultant, Harvey Mudd College

Fall 2018-present

- Advise other students by appointment 4 hours a week in various stages of the writing process for both technical and non-technical assignments
- Serve as a liaison to a professor and help revise their classroom materials for clarity
- Participate in outreach program to workshop college admissions essays with potential 1st generation college students in our community.

Admissions Department Intern, Harvey Mudd College

Spring 2018-Spring 2020

- Provided weekly campus tours to general visitors as well as to special guest groups
- Collected information from faculty various departments to determine how to best represent them in admissions materials

Grader and Tutor, Computer Science and Math Departments

Spring 2019-present

- Graded problem sets and held two-hour weekly tutoring sessions for the following courses: Principles of Computer Science, Computability and Logic, Programming Languages, Real Analysis, Abstract Algebra

Awards and Honors

Harvey S. Mudd Merit scholarship (4 years): “The package will be offered to the top students in the admitted pool who demonstrate superior academic achievement and ability to contribute to the College community.”

2021 CRA Outstanding Undergraduate Researcher Award Finalist

HMC CS Don Chamberlin Research Award: “This award annually recognizes a graduate or graduates judged by the faculty to have successfully completed a significant piece of computer science research.”