Hannah Friedman

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EDUCATION

Harvey Mudd College, Claremont, CA — Expected May 2023
Bachelor of Science, Mathematics, GPA: 3.9/4.0
Awarded the Borrelli Fellowship and the Courtney S. Coleman Prize (Sophomore Mathematics Award)
Dean's List

RELEVANT COURSES

Mathematics: Galois Theory, Representation Theory, Abstract Algebra I, Real Analysis II, Real Analysis I, Probability and Statistics, Numerical Analysis, Partial Differential Equations, Math of Democracy
Computer Science: Data Science, Algorithms, Data Structures/Program Development
Physics: Mechanics & Wave Motion, Electricity & Magnetism

SKILLS

Programming Languages: Python, Java, Racket, C++, R, MatLab, Macaulay2
Languages: German (fluent), Mandarin (conversant), Hebrew (conversant)

RESEARCH EXPERIENCE

Borrelli Fellow, Harvey Mudd College — Summer 2022
Discovered new connections between representation theory, fixed point statistics, and symmetric functions

- Studied permutation statistics through algebraic and harmonic analysis lenses
- Derived a new permutation statistic and related it to existing functions using symmetric function theory
- Conducted literature reviews and developed a computational framework for testing conjectures

Mathematics Department, Harvey Mudd College — Spring 2022
Created a distance measure for datasets using joint nonnegative matrix factorization

- Modified a supervised machine learning technique to create a distance measure for data sets
- Tested our method on data sets using Python
- Wrote the method and experiment sections of our preprint

Mathematics Department, Harvey Mudd College — Fall 2021 - Spring 2022
Investigated relationships between trace ideals and other ideals in commutative rings

- Posed research questions after independently learning background material for research project
- Studied the trace ideals of numerical semigroup rings and how trace carries over primary decomposition
- Used algebraic software to generate examples

Computer Science Department, Harvey Mudd College — Summer 2021
Created a new method for performing symbolic execution using linear algebra and graph theory

- Worked with a research team to generate and optimize an algorithm that utilizes fast matrix multiplication to perform symbolic execution
- Designed and performed tests of matrix symbolic execution method compared to traditional symbolic execution

PUBLICATIONS & PRESENTATIONS

"Joint NMF for Identification of Shared Features in Datasets and a Dataset Distance Measure" (with Amani R. Maina-Kilaas, Julianna, Schalkwyk, Hina Ahmed, and Jamie Haddock)

- Presented a poster at the Southern California Applied Mathematics Symposium, June 2022
- Preprint at https://arxiv.org/pdf/2207.05112.pdf

"A New Basis for k-Local Class Functions" (with Michael Orrison)

- Presented a poster at the Claremont Center for the Mathematical Sciences poster session, August 2022

WORK EXPERIENCE

Tutor/Teaching Assistant, Harvey Mudd College — Spring 2021 - Now

- Help students develop intuition and answer questions about Calculus, Linear Algebra, Differential Equations, Discrete Math, Abstract Algebra I, Harmonic Analysis on Finite Groups, Data Science, and Principles of Computer Science

Grader, Harvey Mudd College — Fall 2020 - Now

- Grade weekly or biweekly homework sets for Calculus, Linear Algebra, and Abstract Algebra I

LEADERSHIP EXPERIENCE

President, Women in Math, Harvey Mudd College — Fall 2022 - Spring 2023

- Support women in mathematics and strengthen the Mathematics community by fostering connections between underclassmen, upperclassmen, and alumni (as mentorship coordinator 21-22)
- Recruit new leadership members
- Host Math Department speakers and organize ushers for speaker events
- Organize social and networking events for women interested in math