Yihan (Yuki) Yang

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EDUCATION

University of Washington **Seattle, WA**

Incoming PhD student of the Paul G. Allen School of Computer Science & Engineering Sep 2025 – Present

- Advisor: Mike Ernst

Harvey Mudd College (HMC) **Claremont, CA**

B.S. in Joint Computer Science and Mathematics Aug 2021 – May 2025

- Cumulative GPA: 3.97/4.0, Major GPA: 3.97/4.0, Dean's List 5 semesters
- Graduated with High Distinction, Honors in Mathematics, and Honors in Computer Science
- Related Coursework: Programming Languages, Database, Algorithm, Operations Research, Computability and Logic, Discrete Math, Abstract Algebra, Real Analysis, Algebraic Geometry, Representation Theory, Mathematics in Big Data, Intermediate Probability, Number Theory and Cryptography, Information Theory and Artificial Learning

PUBLICATIONS

- Mira Kaniyur, Ana Cavalcante-Studart, **Yihan Yang**, Sangeon Park, David Chen, Duy Lam, and Lucas Bang. 2024. *Interprocedural Path Complexity Analysis.* In Proceedings of the 33rd ACM SIGSOFT International Symposium on Software Testing and Analysis **(ISSTA 2024)**. Association for Computing Machinery, New York, NY, USA, 162–173. https://doi.org/10.1145/3650212.3652118
- **Yihan Yang**, Mohit Tekriwal, John Sarracino, Matthew Sottile, Ignacio Laguna. 2025. *Towards Verified Linear Algebra Programs Through Equivalence* accepted at Coq for Programming Languages **(CoqPL)** in POPL2025 https://popl25.sigplan.org/details/CoqPL-2025-papers/3/Towards-Verified-Linear-Algebra-Programs-Through-Equivalence
- (poster) Mira Bhagirathi Kaniyur, Ana Cavalcante-Studart, **Yihan Yang**, Sangeon Park, David Chen, Duy Lam, and Lucas Bang. 2024. *Path Complexity Analysis for Interprocedural Code.* In Proceedings of the 2024 IEEE/ACM 46th International Conference on Software Engineering: Companion Proceedings (**ICSE**-Companion '24). https://doi.org/10.1145/3639478.3643527

PRESENTATIONS, and CONFERENCES

- Worked as a student volunteer and jointly delivered a 20 min talk at **ISSTA 2024**, travel funded by ACM-W and HMC.
- Presented "Interprocedural Path Complexity Analysis" at 2023 USC REU poster presentation, HMC summer CS research open house (July 2023), and HMC summer research poster presentation (Sep 2023).
- Presented "Verified Linear Algebra Programs Through Equivalence" at the LLNL summer poster session.
- Attended the Joint Mathematics Meeting (**JMM 2024**) to gain conference experience and familiarize with cutting-edge mathematics.
- Attended PLMW workshop and **SPLASH 2024**, selected to receive travel grant.
- Attended POPL2025 and gave a 20 min talk at CoqPL2025.

AWARDS and EXAMS

- Courtney S. Coleman Prize, HMC (2023): outstanding performance in mathematics as a sophomore (3 out of Class of 2025)
- Wing and Ellen Tam Award, HMC (2025): given to student team for demonstrating excellence in software design and development.
- Scored 10/10 on the Actuary Probability (P) Exam (2023)
- Qualified for Math Prize for Girls (2020), top 300 girls nationwide in AMC12

RESEARCH EXPERIENCES

Lawrence Livermore National Lab (LLNL) **Livermore, CA**

Undergrad Computing Scholars Intern June – Aug 2024

- Advisors and PIs: John Sarracino, Mohit Tekriwal, and Ignacio Laguna.
- Utilized Coq proof assistant and Mathcomp library to verify the correctness of classical and modified Gram-Schmidt in real numbers. Mechanized helper lemmas that are required for the proof of Gram-Schmidt using Mathcomp library; QEDed 30+ proofs in Coq with the longest proof around 250 lines of code).
- Implemented Gram-Schmidt algorithms in Coq to assist in proving equivalences and correctness.
- Co-wrote the paper "Towards Verified Linear Algebra Programs Through Program Equivalence"; accepted at CoqPL2025.

ALPAQA Lab Path Complexity Team, HMC **Claremont, CA**

Undergrad Researcher, Advisor: Lucas Bang May 2023 – Sep 2024

- Worked on quantifying the difficulty of automated testing using path complexity.
- Optimized existing code on path complexity in Metrinome (https://github.com/hmc-alpaqa/metrinome), and established theoretical improvements on the algorithm of path complexity calculation using concrete mathematics and algebraic combinatorics; made the algorithm 1000 times faster.
- Analyzed different algorithms performance by implementing test cases and performing ablation studies; created a Python script to prevent caching conflicts between different test materials.
- Co-wrote paper and co-designed poster: "Interprocedural Path Complexity Analysis"; published and presented at ISSTA2024.

Bee Lab, HMC **Claremont, CA**

Undergrad Researcher, Advisor: Matina Donaldson Jan – May 2023

- Modeled ant foraging behavior to analyze trade-offs between quality and distance
- Elaborated on the existing model and utilized Python and R for extensive result visualization; conducted parameter sweeps to analyze the influence of each variable on model performance and identified key parameter relationships to improve the model.
- Grouped and quantified parameters using interdisciplinary skills in economics, mathematics, and biology.

WORK EXPERIENCES

Webflow **Remote**

Contractor of R&D Team July 2025 – present

- Work with Webflow research and development team to enhance user workflow and overcome the cold start problem by training and testing LLM models on Webflow data
- Built Chrome Extension that utilizes Gemini API to automate training data generation.

PROJECTS

Clinic Project (Webflow Team), HMC **Claremont, CA**

Team Lead (Spring)/Team member (Fall) Aug 2024 – May 2025

- Work with a team of five Harvey Mudd seniors to address the project sponsored by Webflow as part of the HMC Clinic program.
- Conducted user experience analysis by exploring Webflow's platform to identify key areas for improvement.
- Design and develop a Chrome extension that displays and manages the CSS of selected components of websites, using HTML/CSS, Javascript, and React.
- Engage in regular communication with Webflow's liaison, faculty advisor, and team members, refining project management and collaborative problem-solving skills

Mathematical Contest in Modeling (MCM 2022) **Claremont, CA**

Participant Feb 2022

- Utilized Bitcoin price data to maximize profit by creating a price forecasting and strategic trading model.
- Applied ARIMA and LSTM to predict the price from past data and created three new models for trading strategies that have different dependencies on risk (code in python); did sensitive analysis on the different models.

TEACHING EXPERIENCES

Computer Science Department, HMC **Claremont, CA**

Tutor and Grader Aug 2023 – May 2025

- Tutor and grade "Computability and Logic" (Fall 2023 and Spring 2024) and "Algorithms" (Fall 2024); both are CS major requirements with ~80 students each.
- Tutor and guide students on homework by hosting tutor hours and answering any course-related questions; four hours per week; each tutoring session has 10-15 attendees.
- Form study groups and host mini-lectures on key theorems, building a supportive CS community.
- Contribute to the grader and tutor meetings by sharing experiences and improving tutor strategies.
- Collaboratively graded homework, give constructive feedback on proof writing, handle regrade requests.

Math Department, HMC **Claremont, CA**

Tutor and Grader Aug 2022 – May 2024

- Graded Single and Multivariable Calculus (Fall 2022), Real Analysis (Spring 2023), Discrete Math (Fall 2023), Abstract Algebra (Spring 2024), and Number Theory (Spring 2025).
- Graded homework, including leaving suggestive comments on students' work, identifying logical flaws in proofs, and providing constructive feedback.
- Produced accurate solution keys (LaTex) for Calculus class for other graders to reference.

SKILLS

Programming: Python, C++, R, Racket, Java, Haskell, Rocq, Prolog, SQL, Javascript/HTML/CSS, React
Tools: GitHub, Mathematica, AMPL with Gurobi, Stata, Solidworks, ArcGIS, HMC machine shop certified
Language: English, Mandarin (proficient)
Fun: badminton, travel, photography