PRESTON FU

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Education

University of California, Berkeley, Berkeley, CA
B.S., Electrical Engineering and Computer Sciences, 2022–present

Saratoga High School, Saratoga, CA
National AP Scholar, California Math Council Certificate Award
GPA: 4.00/4.00

Honors and awards

Burger King Scholar	2022
Qualifier, USA Math Olympiad	2020, 2022
Honorable Mention, USA Physics Olympiad	2021, 2022
1st Place, National Tests of Engineering Aptitude, Math, Science	2022
Gold Presidential Volunteer Service Award	2020, 2021
4th Place, Canadian Open Mathematics Challenge	2021
1st Place Algebra, 5th Place Geometry, Stanford Math Tournament	2019, 2020
Gold Division, USA Computing Olympiad	2018

Experience

Everaise Academy, Brookline, MA
Co-founder and Program Coordinator, Spring 2020–present

- Recruited 50+ high school/college students to teach free STEM courses to 1500+ high school students from 40+ countries.
- Edited and published 3 textbooks: Astronomy, Math Competitions I, and Physics Mechanics.
- Raised $15k in sponsorships; directed web and STEM curriculum development, program logistics, finance, web design, school-wide competitions, and guest lectures from professors and industry leaders.

Boston University Systems Engineering Lab, Boston, MA
Research Intern, Summer 2021

- Advisor: Prof. Yannis Paschalidis
- Collaborator: Jimmy Queeney
- Developed locomotion environments for fast prototyping of reinforcement learning algorithms, reduced dimensionality of robotic model's action space.

Stanford University Mathematics Camp, Stanford, CA
Student Author, Summer 2021

- One of 16 selected for Program II in Algebraic Topology.
- Presentation and paper: "Lifting Properties and Classification of Covering Spaces".

Ross Mathematics Program, Columbus, OH
Junior Counselor, Summers 2019 and 2020

- Mentored first-year students in Algebraic Number Theory.
- Teaching assistant for advanced courses: Analytic Number Theory, Topology, Equidistribution.

AlphaStar Academy, Santa Clara, CA
Math Curriculum Developer, Winter 2019

- Wrote curriculum, contest preparation books, and mock exams for middle and high school students with Math Development Team.

Publications **P. Fu**, Math Beyond the Classroom, Amazon (2020).

Projects

Computer Science

Gaussian Mechanism as Protection from Sensitive Input Memorization (2022).
Quantitative and qualitative properties of differential privacy in real-world usage. Built with TensorFlow.

What Learning Looks Like (2020).
React App for sharing experiences and perspectives amid pandemic, representing 5+ continents.

Emojify (2020).
Debias a sentence and associate it with an emoji using word embeddings, Word2Vec, negative sampling.

SARS-CoV-2 Lineage Evaluation (2020).
Predict origin regions of SARS-CoV-2 lineages based on their genomes.

Mathematics

Matrix Lie Groups and the Lie group–Lie algebra correspondence (2020).
Matrix exponentiation, tangent spaces, Lie bracket, Baker–Campbell–Hausdorff formula. Student author at Euler Circle, Abstract Algebra.

3-adic Identities on $\sum_{i=0}^{n-1} \binom{2i}{i}$ (2019).
Alternate proofs of results originally published in American Math Monthly via Hensel's lemma and multivariable calculus. Talk at Euler Circle, p-adic Analysis.

Leadership

President of Saratoga Math Club (2021–2022).

President of Saratoga Engineering Club (2021–2022).

Opinion Editor of Saratoga Falcon Newspaper (2021–2022).

Panelist on Superintendent Advisory Board (2021–2022).

Head Coach and Liaison of Toga Junior Math Club (2019–2022).

President of Boys Team Charity, Saratoga Chapter (2019–2022).

Student leader for Northern California American Regions Mathematics League (2021).

Founding Member and Lead Coordinator for South Santa Clara Valley Mathcounts Chapter (2019–2020).

Skills

Languages: Python, Java, C++, JavaScript
Technologies: PyTorch, TensorFlow/Keras, NumPy, React

Coursework

Saratoga High School
Selected coursework: Deep Learning Specialization (A+), Algorithms Specialization (A+), Linear Algebra (A), Differential Equations (A), Real Analysis (A), Discrete Mathematics (A+), Data Structures (A), Game Theory (A+)