PRESTON FU

Homepage: `prestonfu.com`
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Education	**University of California, Berkeley** B.S., Electrical Engineering and Computer Sciences Expected Graduation: May 2025
	Saratoga High School GPA: 4.00/4.00, National AP Scholar, California Math Council Certificate Award *Selected coursework*: Deep Learning Specialization (A+), Algorithms Specialization (A+), Linear Algebra (A), Data Structures (A), Real Analysis (A), Discrete Mathematics (A+), Differential Equations (A), Game Theory (A+)

Honors and awards	Burger King Scholar	2022
	Qualifier, USA Math Olympiad	2020, 2022
	Honorable Mention, USA Physics Olympiad	2021, 2022
	1st Place Nationally, Tests of Engineering Aptitude, Math, Science	2022
	Gold Presidential Volunteer Service Award	2020, 2021
	4th Place Internationally, 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 — Mar 2020 – present
Co-founder and Program Coordinator — *Brookline, MA*
- Recruited 50+ high school/college students to teach free STEM courses to 1500+ high school students from 40+ countries.
- Edited and published 3 textbooks; raised $15k in sponsorships; directed web and curriculum development, program logistics, finance, school-wide competitions, and guest lectures from professors and industry leaders.

Boston University Systems Engineering Lab — Jul–Aug 2021
Research Intern — *Boston, MA*
- Advisor: Prof. Yannis Paschalidis
- Collaborator: Jimmy Queeney
- Developed locomotion and food collection environments for fast prototyping and performance measurement of reinforcement learning algorithms.
- Reduced dimensionality of robotic model's action space through principal component analysis on virtual actuators.

Stanford University Mathematics Camp — Jul–Aug 2021
Student Author — *Stanford, CA*
- One of 16 selected for Program II in Algebraic Topology.
- Presentation and paper: "Lifting Properties and Classification of Covering Spaces".

Ross Mathematics Program — Jun 2019 – Jul 2020
Junior Counselor — *Columbus, OH*
- Mentored first-year students in Algebraic Number Theory.
- Teaching assistant for advanced course in Analytic Number Theory.

AlphaStar Academy Dec 2019
Math Curriculum Developer Santa Clara, CA

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

Books

Preston 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. Case study in protecting PIN numbers from perplexity-based attacks, built with TensorFlow.

What Learning Looks Like (2020).
Allowing students to share experiences and perspectives amid COVID-19 pandemic, representing 10+ countries and 5+ continents. Built with React.

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

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).

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: TensorFlow/Keras, NumPy, Pandas, React, PyTorch