PRESTON FU

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EDUCATION

Saratoga High School • 2018–2022

Academic Highlights	**GPA 4.51W / 4.0UW** • SAT 1590 • ACT 36 • SAT Math II 800
National AP Scholar Scored 5 on all 15 exams	Calculus BC • Computer Science A • Physics 1, 2, C Mech, C E&M • Statistics • Chemistry • English Lang. • Chinese • Microeconomics • Macroeconomics • U.S. History • World History • Human Geography
Activities & Societies	Math Club President & Team Captain • Engineering Club President & Team Captain • Superintendent Advisory Board (1 of 12 to represent 3300+ students) • Opinion Editor of CSPA Award-Winning Saratoga Falcon newspaper • Varsity Tennis Player
College Coursework	Multivariable Calculus • Linear Algebra • Differential Equations • Discrete Math • Data Structures • Real Analysis
Online Coursework	Deep Learning & Neural Networks • Improving Deep Neural Networks • Structuring Machine Learning Projects • Convolutional Neural Networks • Sequence Models • Divide & Conquer, Sorting & Searching, Randomized Algorithms • Graph Search, Shortest Paths, Data Structures • Greedy Algorithms, Minimum Spanning Trees, Dynamic Programming • NP-Completeness
Independent Study	Modern Number Theory • Abstract Algebra • Enumerative Combinatorics • Game Theory

MATH AND ENGINEERING EXPERIENCE

Research Intern • **Boston University RISE** • 2021 — github.com

- Developed locomotion and food collection environments. Significantly reduced dimensionality of robotic model's action space through principal component analysis on virtual actuators.
- Enables fast prototyping and performance measurement of neuro-inspired reinforcement learning algorithms for autonomous navigation in unstructured domains.

Student Author • **Stanford University Mathematics Camp** • 2021 — (expository paper)

- **Algebraic Topology:** Identification spaces, fundamental group, Seifert–Van Kampen theorem, simplicial homology.
- **Expository paper—"Lifting Properties and Classification of Covering Spaces":** Covering maps, path- and homotopy-lifting, relationship to fundamental group, universal cover, connection to the Galois correspondence.

Published Author • ***Math Beyond the Classroom*** • 2019–2020 — amazon.com

- Wrote and published nationally-read book of challenging math problems for middle and high school students.
- Raised funds for complimentary need-based copies. Featured by Minnesota State MATHCOUNTS.

Junior Counselor • **Ross Mathematics Program** • 2019–2020

- Mentored students in Algebraic Number Theory: Continued Fractions, Resultants, Quadratic number fields.
- Teaching assistant for advanced courses in Analytic Number Theory, Topology, Equidistribution.

Student Author • **Euler Circle** • 2019–2020

- **Abstract Algebra:** Sylow theorems, Galois Correspondence, Abel-Ruffini theorem. — (expository paper)
- **Expository paper—"Matrix Lie Groups and the Lie group–Lie algebra correspondence":** Matrix exponentiation, tangent spaces, Baker–Campbell–Hausdorff formula.
- **p-adic Analysis:** Teichmüller representatives, Newton's polygons, profinite integers. — (presentation notes)
- **Presentation—"3-adic Identities on $\sum_{i=0}^{n-1} \binom{2i}{i}$":** Alternate proofs of results originally published in American Math Monthly via Hensel's lemma and multivariable calculus.

Curriculum Developer • **AlphaStar Academy** • **2019**

- Employed in Math Development Team: Wrote challenging problems for middle and high school students.

JOURNALISM EXPERIENCE

Developer • **Cronkite Summer Journalism Institute** • **2021**

- Created "Feed" website: Increased awareness of political biases and polarization among users through a 2-D game and a 3-D augmented reality simulator.

Developer & Writer • **Newsroom by the Bay** • **2020** globalstudentsquare.org

- Built "What Learning Looks Like" web platform: allowing students from across the world to share experiences and perspectives amid the COVID-19 pandemic.
- Connections spanning 10+ countries and 5 continents. Featured by Chalkbeat.

LEADERSHIP EXPERIENCE

Co-founder & Program Coordinator • **Everaise Academy** • **2020–present** everaise.org

- **Co-founder:** 501(c)(3) non-profit online STEM school.
- **Program Coordinator:** Recruited over 50 qualified high school and college students to teach courses in Math, Physics, Biology, and Astronomy to 1500+ students from 40+ countries. Raised $15k in sponsorships. Edited and published 3 textbooks. Directed web and curriculum development, program logistics, finance.

Head Coach & Liaison & MATHCOUNTS Lead Coordinator • **Toga Junior Math Club** • **2018–present**

- **Head Coach:** Created comprehensive 3-year rotating curriculum. Led 15 high school volunteers to teach weekly classes to middle school students.
- **Liaison:** Organized club events, contest participation. Facilitated communication between administrators, volunteers, parents, students.
- **South Santa Clara Valley MATHCOUNTS Chapter Lead Coordinator:** Organized testing logistics, proctoring, and grading for chapter of 12 local middle schools.

President • **Boys Team Charity, Saratoga Chapter** • **2017–present**

- Organized guest speaker and charity events for a volunteer chapter of 130+ members.
- **STEM project designer, Sunday Friends:** Set up computer system and math problem database for K-5 students. Developed stations and led math and science activities.

HONORS AND AWARDS

USA Junior Math Olympiad	2020 Top 80 Nationally
USA Physics Olympiad	2021 Honorable Mention, Top 150 Nationally
USA Computing Olympiad, Gold Division	2018
Canadian Open Mathematics Challenge	2020 Honorable Mention, Top 8 Internationally
American Regions Mathematics League	2020–2021 Top 30 Nationally • Team 1st
Physics Bowl, Division I	2021 Team 2nd Nationally
US Math Competition Association, Premier Division	2020 Team 4th Nationally
Tests of Engineering Aptitude, Math, Science	2019–2020 National Qualifier
California Math Council Certificate Award	2021

SKILLS

Languages	Python, Java, C++
Technologies	NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn, TensorFlow/Keras