

PRESTON FU

 prestonfu.com

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 [prestonfu](https://github.com/prestonfu)

EDUCATION

Saratoga High School • 2018–2022

Academic Highlights GPA 4.51W / 4.0UW • SAT 1590 • ACT 36 • SAT Math II 800

National AP Scholar Calculus BC • Computer Science A • Physics 1, 2, C Mech, C E&M •
Scored 5 on all exams 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 Multivar. Calculus • Linear Algebra • Differential Equations • Discrete Math • Data Structures

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 • Real Analysis • Enumerative Combinatorics • Data Science

MATH AND ENGINEERING EXPERIENCE

Research Intern • Division of Systems Engineering, Boston University • 2021

 [github.com](https://github.com/prestonfu)

- 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; facilitates efficient testing of neuroscience hypotheses.

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](https://www.amazon.com/dp/B084JN8K8K)

- 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, Lie algebras, Lie group–Lie algebra correspondence, 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.

Innovator & Designer • USC Viterbi Innovation Bootcamp • 2020

- Designed "Headline": Gamified news source that incentivizes COVID-19-related education through team trivia by rewarding users for staying up-to-date on scientific facts.

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. Directed web and STEM curriculum development, program logistics, finance, sponsorships and partnerships, content publishing and delivery.

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

- **Head Coach:** Created comprehensive 3-year rotating curriculum. Led 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-6 students. Designed and led art-based activities on acids and bases, momentum and energy, and polygons and symmetry.

HONORS AND AWARDS

USA Junior Math Olympiad

USA Physics Olympiad

USA Computing Olympiad, Gold Division

Canadian Open Mathematics Challenge

American Regions Mathematics League

Physics Bowl, Division I

US Math Competition Association, Premier Division

Stanford Math Tournament

Tests of Engineering Aptitude, Math, Science

California Math Council Certificate Award

2020 Top 80 Nationally

2021 Honorable Mention, Top 150 Nationally

2018

2020 Honorable Mention, Top 8 Internationally

2020–2021 Top 30 Nationally • Team 1st Internationally

2021 Team 2nd Nationally

2020 Team 4th Nationally

2019–2021 Algebra 1st • Geometry 5th • Calculus 8th • Team 1st

2019–2020 National Qualifier

2021