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 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 (12 to represent 3300+) • 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

Developed MuJoCo-compatible locomotion and food collection environments. Significantly reduced dimensionality of robotic rodent model's action space through principal component analysis on virtual actuators.
Enables faster prototyping of novel reinforcement learning algorithms and efficient testing of neuroscience hypotheses for autonomous navigation in unstructured domains; motivates real-world biological experiments.

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

Algebraic Topology: Identification spaces, Fundamental group, Seifert–Van Kampen theorem, simplicial homology.
Expository paper—"Covering Spaces": Covering maps, path- and homotopy-lifting into general topological spaces, relationship to fundamental group, universal cover.

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 first-year 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": 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—"Strange 3-adic identities": Alternate proofs of surprising 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 as member of Math Development Team: Wrote challenging problems for middle and high school students.

Student • **Prove it! Math Academy** • **2018**
Developed proof techniques in hyperbolic geometry, *q*-analogs, and generating functions.
Presented solutions to challenge problems at end-of-program conference.

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. Connected with students from 10+ countries.

LEADERSHIP EXPERIENCE

Co-founder, Program Coordinator • **Everaise Academy** • **2020–present** everaise.org
Co-founder: PVSA-certifying 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 and Head Coach • **Toga Junior Math Club** • **2018–present**
Liaison: Organized club events, contest participation. Facilitated communication between administrators, volunteers, parents, students. Lead coordinator for logistics and proctoring at South Santa Clara Valley MATHCOUNTS Chapter of 12 local middle schools.
Head Coach: Created comprehensive 3-year rotating curriculum; led high school volunteers to teach weekly classes.

President • **Boys Team Charity, Saratoga Chapter** • **2017–present**
Organized guest speaker and charity events for a volunteer chapter of 150+ members.
STEM project designer and lead at Sunday Friends low-income community center: Engaged K-6 students in math through origami; set up computer system and math problem database.

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 Internationally
Physics Bowl, Division I	2021 Team 2nd Nationally
US Math Competition Association, Premier Division	2020 Team 4th Nationally
Stanford Math Tournament	2019–2021 Algebra 1st • Geometry 5th • Calculus 8th • Team 1st
Tests of Engineering Aptitude, Math, Science	2019–2020 National Qualifier
California Math Council Certificate Award	2021