Aanya Gupta

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RESEARCH EXPERIENCE

Wolfram Summer Research Program + Independent Research Jun. 2025 – Present

- Built a model of a Kathak dancer's lower body using forward and inverse kinematics in the Wolfram Language.
- Continued developing the project for 15+ months independently with virtual mentors.
- Developed mathematical criteria separating safe from unsafe movement based on weight-shift dynamics and meniscus tensile fatigue [Aug-Dec 2025].
- Modeling meniscus damage accumulation, propagation, and tear patterns with 2D/3D cellular automata [Dec 2025-present].
- Wolfram Staff Pick. Presented at Texas A&M University.

Wolfram Emerging Leaders Program Aug. 2025 – Jan. 2026

- Built a Wolfram Language model comparing how often voting systems produce paradoxical outcomes.
- Designed automated tests for IIA violations, the spoiler effect, and Arrow's fairness criteria.
- Found that instant-runoff violated fairness criteria in 16% of trials vs. 34-40% for other systems; Wolfram Staff Pick.

Program for Research in Mathematics (PReMa), Texas A&M Jan. 2024 – Present

- Co-authored a grid-based model comparing curbside recycling with drop-off centers.
- Modeled cities as parameterized grids, with distance-dependent participation and the number and cost of facilities needed for full coverage.
- Introduced effectiveness functions combining cost and participation-adjusted satisfaction; showed curbside pickup maximizes participation while well-placed centers cut costs in lower-density cities.
- Presented at 2026 Texas High School Mathematics Research Conference, Texas A&M University [May 2026]

University of California San Francisco AI4ALL Jul. 2024 – Jul. 2024

- Built a PyTorch multilayer perceptron with a 5-person team to predict protein-protein binding residues from sequence.
- Found that ~84% accuracy hid a model predicting almost no binding sites; applied weighted loss to raise F1 from 4% to 26% and tuned 13 model configurations.
- Delivered final presentation to faculty, and at the Stanford OHS Science Research Colloquium.

ENGINEERING AND ENTREPRENEURSHIP

AEGYS, UC Berkeley Haas BBAY – *Co-founder & CTO* Jul. 2026 – Aug. 2026

- Co-founded AEGYS, a wearable-tech venture building smart compression sleeves that can detect overexertion to prevent overuse injuries. Researched injury rates and competitors to define target users.
- As CTO, led technical design for a 6-person team, taking the concept from research to a prototype in one week. Modeled the sleeve and sensor housing in Fusion 360 through 6 iterations. Designed a detachable electronics module so the sleeve is machine-washable.
- Built a 3D-printed knee model with layered sleeves demonstrating EMG (Electromyography) for muscle fatigue, pressure, and IMU (Inertial Measurement Unit) sensor placement and fit.

Technovation Girls – *Co-founder & Developer* Jan. 2022 – Apr. 2025

- Built T.E.D.D.Y., an AI tool that flags distress in student writing. World Finalist, 1 of 5 Junior teams from ~2,000 [Oct 2023]
- *Other seasons:* AION [Semifinalist, 2022]: a homework-scheduling calendar app; Repromatic [Quarterfinalist, 2024]: a LEGO-piece classifier that suggests builds; Inkly [Quarterfinalist, 2025]: a voice-journaling app.

FIRST TECH Challenge Robotics Team 5206 – *Vice Captain (elected, 3 yrs); Outreach Lead (elected, 1 yr)* Sep. 2021 – Present

- Designed CAD components, built robot subsystems, and programmed autonomous, drive, and control software in Java.
- As Outreach Lead, directed mentoring of 5 FIRST LEGO League teams in the US and Rwanda. Partnered with other clubs on coding, AI, physics, and math workshops for girls in STEM.
- Team won the FTC Connect Award at the CA-NorCal Peninsula League Tournament [2024] during my term as Outreach Lead

TEACHING AND LEADERSHIP

Wolfram High School Summer Research Program – *Teaching Assistant* Jun. 2026 – Jul. 2026

- Selected as 1 of 12 TAs for a 3-week full time residential computational research program serving 84 high school students on their research projects (from 7 am to 10 pm).
- Coached students on Wolfram Language coding, debugging, and project scoping; reviewed drafts for 20+ published essays and was acknowledged in 16.
- Wrote an inverse kinematics function cited in a student's published research on a three-link robotic manipulator.
- Served as primary residential contact for 8 students; organized 5 program-wide events for ~30 students, supported the technical arts minor, and coached students for final presentations.

FIRST LEGO League Mentoring – *Mentor* Sep. 2023 – Present

- Mentored 5 FLL teams reaching 50+ students ages 6-15, including an underserved team in Rwanda remotely for 49+ hours. Created guides helping its coaches move students from block-based to text-based coding and TinkerCAD.

- Coached 3 San Francisco Day School teams and a rookie Austin team on robot coding and hardware design, guiding 3 teams to state competition.

Science Research Club - Stanford Online High School – *Founder* Sep. 2021 – Present
- Founded the club and grew it from 2 to 35+ members.
- Organized 15 guest speakers, led workshops on the scientific research process, and collaborated with other clubs.

The Observer, High School Newspaper – *Editor-in-Chief (1 yr), Associate Editor (2 yrs), Staff Writer (3 yrs)* Sep. 2021 – Present
- Led a 20+ person staff, authored 12+ articles, and created the Riddle Room, the paper's first games column.

Stanford Online High School – *Teaching Assistant & Peer Tutor* Sep. 2022 – Present
- Teaching Assistant for 5 courses and Peer Tutor for 13, including AP Calculus BC, AP Biology, Data Structures, and Advanced Topics in Biological Systems. Led 37 exam review, office hour, and one-on-one sessions.

Yearbook Club – *Managing Editor (2 yrs), Copy Editor (1 yr), selected by faculty panel, Member* Sep. 2021 – Present
- Track deadlines and run monthly check-ins for 25+ staff members to plan, design, and publish the 80+ page yearbook.
- Designed 3+ spreads each year. As the Copy Editor reviewed the 80+ page yearbook before publication.

Ethics Bowl Club – *Competitive Team Member* Sep. 2023 – Present
- Selected as 1 of 7 students to represent Stanford OHS at the National High School Ethics Bowl NorCal Regional (2 yrs), and 1 of 9 for TKEthics and the Pan American Ethics Olympiad.
- Earned Honorable Mention at the Senior Pan American Ethics Olympiad [2026] from 34 teams (placed 7th overall)
- Led a monthly whole-club meeting, mentored younger members, and hosted a cyber-ethics workshop for ~75 students

ARTS AND SERVICE

Chitresh Das Institute (Kathak, Indian Classical Dance) – *Senior Youth Company Member (by audition)* Jun. 2015 – Present
- Trained in Kathak for ~12 years; selected by audition for the Youth Company after 6 years of training.
- Performed at 7 international dance festivals alongside professional ensembles, opened 11 home-season performances of the professional Chitresh Das Dance Company, and performed at 36+ events [2021-2026], including solos.
- Performed "Agni," a work about California's wildfires, for audiences of 250-700+. I authored a blog post linking my repertoire to the pollution of India's rivers.
- Mentored 6 students for 35+ hours as they prepared for pre-professional auditions; all 6 were accepted

California State Parks Foundation – *Core Leader, Volunteer* Jun. 2019 – Present
- Volunteered for 7+ years, starting at age 10. One of the youngest Core Leaders, leading, organizing, and documenting workdays of 35-100 volunteers @Half Moon Bay State Beach for California Start Parks Foundation.
- Work on habitat restoration, trail repair, historic building restoration, and mentoring younger and first-time volunteers.
- 2026 team impact so far: 28,000 sq. ft. sheet-mulched, 134,200 sq. ft. weeded, 900 native plants planted, with more than 500 volunteers. Featured in CSPF's "Why We Volunteer" blog.

Opportunities for All, City & County of San Francisco – *Visual Arts Intern (Paid)* Jun. 2023 – Aug. 2023
- Selected for a city youth internship. Co-designed and helped create a community mural in San Francisco with 7 other interns while exploring careers in the visual arts.

HONORS AND AWARDS

- Berkeley Business Academy for Youth, UC Berkeley Haas School of Business, Community Award and Bear Scholarship [2026]
- California Science & Engineering Fair, Senior Division Honorable Mention, Biology & Physiology [2026], for Kathak injury modeling
- Golden Gate STEM Fair, Senior Division 2nd Place, Engineering Sciences [2026], for Kathak injury modeling
- Senior Pan American Ethics Olympiad, Honorable Mention, 7th place [2026]
- National Merit Scholarship Program, Commended Student [2026]
- AP Scholar with Distinction [2025, 2026]; AP Scholar with Honor [2024]
- NCWIT Aspirations in Computing Affiliate Winner [2024-2025 & 2025-2026]
- NCWIT Aspirations in Computing National Honorable Mention [2024-2025]
- Wolfram Community Staff Picks - exceptional Wolfram-based work selected by the Wolfram Community Board [2025, 2026]
- Alameda County STEM Fair, Senior Division 3rd Place, Systems Software [2025], Systems Software [2025], for BeTaal, a tool that helps beginning and hearing-impaired dancers stay on beat
- National Academic Quiz Tournament (NAQT) Nationals 65th of 336 teams [2025] and 65th of 320 teams [2024]
- College Board National Recognition Program, School Recognition Award [2025]
- Golden Gate STEM Fair, Senior Division 3rd Place, Mathematics [2024], for Repromatic, AI app to identify LEGO robotics pieces from a photo for reuse
- FIRST Tech Challenge Connect Award (CA NorCal Peninsula League Tournament [2024]
- AIME Qualifier [2022] AMC 10A score of 105; 2023 AIME II score of 5 [2023]
- AMC 10 Certificate of Distinction (top 5%), Young Student Certificate of Achievement [2022]

SKILLS

Technical: Python, R, Java, C, C++, Wolfram Language, PyTorch, Git, LaTeX, Fusion 360 (CAD), 3D printing, Canva, Blender, Notion, Streamlit, Linux, Overleaf (LaTeX), TinkerCAD, 3D printing, HTML/CSS, WordPress, BioRender