Sharanya Vats

I am a rising high school junior passionate about engineering, astrophysics, mathematics, and their application in today's world. I plan to use data science as an important tool in my efforts to fight the environmental effects of our growing reliance on technology. I want to create sustainable solutions to help reduce environmental crises, such as space debris and the carbon crisis. I have proficient experience in visualizing data, cleaning data, analyzing data, and using languages such as HTML, CSS, Python, and JavaScript. I have developed strong communication and problem solving skills through my various experiences as well. I am strongly interested in applying my skills and gaining practical exposure to a professional work environment. I will approach all obstacles with a logical and strategic mindset and I am eager to learn and grow.

Contact Information

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Education

Alliance Academy for Innovation of Cumming-Forsyth (2024-2028)
High School Junior (Class of 2028)

- Unweighted GPA: 4.0/ Weighted GPA: 4.36
- Relevant Courses: AP Seminar, AP Psychology, AP Precalculus, AP Statistics, AP Computer Science Principles, Honors Chemistry, Accelerated Geometry B/Algebra II, Honors Biology, Intro to Healthcare,
- Expected Future Courses (2026-28): AP Research, AP Physics (1, 2, and C), AP Chemistry, AP Calculus AB/BC, AP Computer Science A, Georgia Tech Linear Algebra and Multivariable Calculus, Georgia Tech Distance Computer Science

Research Experience

CarbonLens- Open Source AI Sustainability Framework

- Self-built low-code tool tracking AI datacenter carbon vs water tradeoffs
- Analyzed GPT-3 (700k liters water) + Atlanta datacenter power data
- HTML/JavaScript + Power BI dashboards | Deployed on Github

"Light Pollution's Mathematical Impact on Astrophysical Observations" - Research Paper

- Quantified Atlanta's 0.37 magnitude loss from VIIRS radiance (+28%)
- Limiting magnitude equation: $\Delta m = 2.5 \log(32/25\ nW/cm^2/sr)$

"Power Law Scaling of AI Carbon Emissions with Model Size" - Research Paper

- Derived $CO_2 \propto params^{1.9}$ from GPT-3/BERT training data
- Mathematical modeling: log-log regression ($\alpha \approx 1.8$-2.0) via Excel

"Investigating the Effects of CO2 Production from AI Centers on the pH and Phosphate Levels of Plants and Their Growth Medium" - Science Fair Experiment

- Exposed Malabar spinach/philodendron to 1200 ppm CO_2 (AI datacenter levels)
- Measured pH drop: 6.8→6.1 (spinach), 7.7→6.1 (philodendron) vs controls

"AI Data Center Risk: Carbon Emissions and Water Depletion Threats to Metro Atlanta" - Research Paper submitted to Modeling the Future Challenge

- Quantified carbon emissions and water stress index on primary freshwater sources to Metro Atlanta region with government-backed sources
- Developed and analyzed Exponential Emissions Projection Model and Water Stress Index Model through Python modeling to analyze metrics across mitigated, worsened, and base case scenarios

"Clear-Orbit Skin (COS-Skin) Orbital Debris Reducer" - Research Paper submitted to Toshiba ExploraVision Competition

- Designed a voltage-activated smart coating that increases atmospheric drag coefficient to accelerate satellite deorbiting without propulsion
- Applied orbital drag physics, rarefied gas dynamics, and momentum accommodation theory to model accelerated orbital decay through surface roughness engineering
- Compared propulsion, drag sails, electrodynamic tethers, and passive coating approaches through systems engineering tradeoff analysis to optimize mass, reliability, and scalability

Leadership Experience

New York Junior Academy of Sciences (NYJAS) Team Lead, Human-Centered AI
• Led AI research team as high school representative in international STEM leadership program
• Coordinated research projects and represented peers in professional scientific settings
• Developed leadership through competitive selection and international program participation

Climate Leaders Fellowship Recipient
• Selected for national climate leadership program through competitive application process
• Represented school in sustainability initiatives, demonstrating initiative and commitment

Founder & President, Eco MoCO ATL (2025–Present)
• Founded student chapter of national organization; built officer team with service events and educational workshops
• Developed membership systems, volunteer coordination, and community outreach strategies

HOSA Sophomore Council (2025–Present)
• Selected as 1 of 14 leaders (100+ applicants) to plan events for 200+ member chapter at Alliance
• Executed volunteer programs and professional development activities
• Worked under several different committes in the CTSO with experience leading workshops and delivering reports

Professional Experience

Data Analyst Intern, STEM·E Youth Career Development Program (2025–Present)
• Analyzed engagement data to optimize program structure; delivered professional reports to leadership
• Used Power BI to create actionable insights for organizational improvement

Math Instructor & Trainer, Mathnasium (Feb–Nov 2025)
• Taught 20+ students weekly; trained new instructors and delivered parent progress reports
• Demonstrated professional communication and consistent student performance gains

Schoolhouse.world SAT Tutor (Dec 2025–Present)
• Deliver SAT instruction to global students (100,000+ learner platform, 180+ countries)
• Mastered live presentation skills and structured teaching methodology

North South Foundation Volunteer (August 2024–Present)
• Instruct students across the country in mathematics, spelling, and vocabulary at the competition level
• Generate all profits from instruction through the national program, later delivered to underprivileged students in India unable to afford tuition

Competitive Experience

Modeling the Future Challenge Finalist (2025–Present)
• Selected as 1 of 15 national finalist teams through Scenario Phase excellence
• Named Climate Resilience Award Finalist (1 of 8 nationally recognized teams)
• Advanced to Finalist Phase demonstrating strategic analysis and risk modeling skills

3rd Place, HOSA State Leadership Conference — Health Education (2026)
• Earned 3rd place at state level among top competitors through strategic preparation and polished delivery
• Demonstrated ability to research, organize information, and present effectively under competitive pressure
• Developed frameworks for high-stakes competition prep applicable to FBLA state/national events

Awards

AP Scholar with Distinction | New York Junior Academy of Sciences Member (few thousand students selected nationally) | Climate Leaders Fellow (Stanford-affiliated) | Modeling the Future Challenge Finalist | Top 3 in State for Health Education | HOSA International Leadership Conference Participant | Rising Star Student for Aerospace (School-level) | 4th Class Rank | Beta Club Member | National Society for High School Students Member

Skills

Leadership | Data Analysis (Power BI) | Team Building | Event Planning | Professional Communication | Competition Strategy | Organization Systems