Aadrit Talukdar

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Education:

Basis Independent Silicon Valley (Class of 2026)
Unweighted GPA: 4.0/4.0
Weighted GPA: 4.69/5.0
ACT: 35/36

Independent Research:

"Analysis of Harmful Emission Spread in Southeast Asia" Summer 2024 – Ongoing

- Modeled emission spread from brick kilns within Bangladesh using data from air quality sensors in school zones.
- Analyzed patterns in trash burning smoke around Southeast Asia compared to the waste compositions of trash landfills to model air quality/emission compositions

"Identifying and investing in electricity medically dependent homes most at risk to power outages in California" Summer 2025

- Analyzed the prevalence of households which have power-reliant medical needs in California
- Determined how many of those households were at-risk during a power outage
- Prepared an estimation of the costs/benefits of installing solar panels and battery packs in said households for medical equipment to further support policy decisions

"A Novel Approach for Improving Effectiveness of Prescribed Burns Using ML Models Based on Geospatial and Climate Data" Fall 2024

- I developed machine learning models to predict fire behavior (area burned) based on climate variables (temperature, wind speed, etc) and geospatial data (vegetation/moisture content)
- Derived NDVI (vegetation index) and NDMI (moisture index) from LandSat data
- Investigated multiple ML models: ANN, KNN, Random Forest, SVM,
- Compared model results with existing wildfire simulators
- Submitted research to Synopsys Science Fair

"Wildfire Data Analysis & Report" Summer 2024

- I compiled and analyzed wildfire data from California to identify trends. I then used computer modeling to find correlations between wildfires and various climate conditions.
- Performed analysis of two wildfire simulators: Wildfire Explorer from the Concord Consortium and Wildfire Analyst Pocket Edition from Technosylva
- Research done under the guidance of Dr. Majid Poshtan, Associate Professor, Electrical Engineering, Cal Poly
- https://github.com/AadritT/WildfireDataAnalysis.git

"A Novel Approach for Early Detection of Wildfires Using Power Line Crawlers with Embedded ML Image Classification" Fall 2023

- I prototyped a power line crawling robot that would take pictures of the area below and used machine learning to detect wildfires earlier.
- Submitted research to Synopsys Science Fair
- https://github.com/AadritT/WildfireCrawler

"*Improving predictions of power outages and determining resiliency of power grids on the West Coast utilizing machine learning and sensitivity analysis*" Summer 2023

- I used machine learning models like Artificial Neural Networks to predict the occurrences of power outages with weather data.
- Presented work in the Polygence Symposium of Rising Scholars
- Published in Journal of Student Research High School Edition - https://doi.org/10.47611/jsrhs.v13i1.6176
- https://github.com/AadritT/PowerOutagePrediction

"Predicting Air Quality Based on Climate Factors in Various Geographical Locations Utilizing Artificial Neural Networks" Fall 2022

- I used machine learning model of an Artificial Neural Network to predict how air quality changes over time using weather data.
- Submitted research to Synopsys Science Fair
- https://github.com/AadritT/AirQualityPrediction

Patent:

- U.S. Patent (Granted) 12,304,694 B2, "Modular and Reusable Packaging System," May 20th, 2025
- U.S. Patent Application (Provisional) 63/757,794 "Power Line Crawler for Wildfire Detection"

Notable Extracurricular Activities:

Youth Advisory Committee of San Jose District 5
Deputy Commissioner of Research and Policy *Jan 2023 - Current*

- Appointed Chairman position by Youth Commissioner
- Represented the YAC at the Mosaic Festival with over 150 attendees and performers
- Organized and Led the San Jose Culture Fest and Resource Fair at the Alum Rock Youth Center with over 50 attendees
- Tabled for the Youth Commission at Vive Calle, a cultural event held at San Jose
- Led Policy Conference Discussion for two years in a row in Martin Luther King Jr Library impacting youth in San Jose
- Wrote a policy memorandum on school safety which was reviewed by City Council
- Organized Thank You America Day in Viet Museum of San Jose with around 1000 people in attendance, including Former Congressman Mike Honda and Congresswoman Zoe Lofgren
- Organized Tet Festival in Eastridge, the largest Vietnamese Lunar New Year Celebration and Culture Festival at James Lick High School with over 40 attendees
- Hosted the Youth Budget Summit with 50+ youth and discussed the issues they saw in their communities, presenting ideas to attending Councilmembers

Valley Water Youth Commission
Youth Commissioner for District 1 *July 2025 - Current*

- Assists the Valley Water board with education, outreach, and other matters impacting Santa Clara County youth.

BASIS Science Olympiad Division B
Vice President of Competitive Events *August 2022-April 2023*

- Oversaw the subject captains for the different event sections
- Mentored the 10 less experienced team members with tips and tricks I had learned from experience
- My team got 5th place in SCC Regionals

Achievements/Awards:

- 3M Young Scientist Competition Top Ten Finalist Second Place Winner (*2021)*
- Synopsys Silicon Valley Science and Technology Championship: First Place in Physical Sciences and Engineering, Qualified for California Science & Engineering Fair (CSEF) (*2021)*
- Synopsys Silicon Valley Science and Technology Championship: US Air Force Certificate of Achievement for Outstanding Science/Engineering Fair Project (*2023-24)*
- Synopsys Silicon Valley Science and Technology Championship: Exceptional Merit Certificate from SPV Market Research *(2023-24)*
- Broadcom Masters 300 (*2021)*
- San Jose Youth Commission Certificate of Recognition For embodying the Core Value of Responsibility (*2024)*
- ACSL Finalist (i.e. ACSL Invitational All-Star) *(2022,2023)*
- Science Olympiad: 1st place for Crave the Wave and Wheeled Vehicle, SCC Regionals, (*2022-2023),* 5th Place for Bungee Drop, SCC Regionals (2024-25)
- NLE (National Latin Exam) Special Book Prize for 4 Gold Medals (*2025*)
- NLE Gold Medal (*2022, 2023, 2024, 2025*) and Perfect Score (*2023*)
- AP Scholar with Distinction *(2023, 2024)*

Summer Programs

- MIT Beaverworks Summer Institute 2025 - Microelectronics Course (7/7 - 8/3)
- BizWorld YES! Accelerator Program Summer Cohort 2025 (6/19 - 9/4)

Relevant Coursework:

- Schoolwork
    - AP Computer Science A [5], AP Calculus BC [5], AP Calculus AB [5], AP Physics C: Mechanics [5], AP Physics C: E&M [5], AP Physics 1 [5], AP U.S. Government [5], AP US History [5], AP Computer Science Principles [5], AP

Chemistry [5], AP Statistics [4], AP Latin [5], AP Language [5], AP World History [5]

- Outside Schoolwork:
  - COMPSC-076 Computer Science I Evergreen Valley College, Summer 2024
  - COMPSC-075 Computer Science I Evergreen Valley College, Summer 2023
  - Summer UCI x GATI Independent Research Paper Writing Program, Summer 2023
  - Udemy Course The Complete Python Bootcamp From Zero to Hero in Python
  - Coursera Course Digital Systems: From Logic Gates to Processors

Skills: Proficient in Python, Java, Arduino, Git, Github, TinkerCad, Scratch