

Amitesh Senthilkumar

Profile Links:

- GGV2 Robot Design: bit.ly/amitesh-ggv2
- Trasktalker App Live: bit.ly/amitesh-trashtalker-app
- UCSD Research: bit.ly/amitesh-ucsd
- GitHub: bit.ly/amitesh-github

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Achievements & Awards

- **FIRST Tech Challenge Michiana Premier Event June 2025:** Placed 3rd of 96 teams; reached semifinals against the #1 ranked team in the world and eventual champions. Earned Inspire 3 Award (3rd most inspiring team out of 48) for community engagement, international STEM advocacy, industry collaboration, and innovative robot design.
- **FIRST Tech Challenge regular season 2024- 25:** 108th in the world for autonomous scoring category; Gauss League Winning Alliance; Innovate Award winner; undefeated at Regional Qualification
- **UCLA Gen AI:** 2nd out of 50 teams at UCLA Summer Institute for the development of an LLM based AI App.
- **Speech and Debate**
 - **Public Forum:** 2nd place at San Diego Imperial Valley Speech League (2024)
 - **Impromptu:** 2-time finalist at San Diego Imperial Valley Speech League (2022, 2023)
 - **Rotary Speech:** Placed 2nd and 3rd in 2023 and 2024

Work experience & Research

President - Clean Campus Club, Mt. Carmel High School [2024 - 2026] (bit.ly/amitesh-trashtalker-app)

- Over 8 billion pounds of store-drop-off plastics end in the landfill or contaminate curbside recycling every year.
- Started a school club in partnership with NexTrex to recycle such plastics into composite decking, collecting over 100 pounds of plastics-every month. This initiative is now being expanded to all district high schools.
- Created a robotic trashcan (Trasktalker), to sort trash, including store drop-off plastics

Intern — Research Experience for High School Students, UCSD [Summer 2025] (bit.ly/amitesh-ucsd)

- Project: Leveraging Molecular Fingerprints and DFT Inputs for pKa Prediction Using XGBoost
- pKa, which measures a molecule's acidity, impacts drug design, materials science, and catalysis. While full DFT pKa calculations are highly accurate, they are computationally expensive.
- Developed XGBoost models integrating molecular fingerprints with low-cost DFT descriptors to improve pKa prediction speed and accuracy. Trained on 2,386 molecules and validated on SAMPL6 and Novartis datasets, achieving MAE < 1.0 —even for functional groups where raw DFT exceeded 5.0.

Vice Captain - FIRST Tech Challenge [AUG 2020 - JUN 2026] (bit.ly/amitesh-ggv2)

Driven leader with a fierce passion for the team's mission, serving in multiple roles over the years—including Mechanical Lead, Software Lead, Think Lead, and key outreach contributor.

- **Outreach:**
 - Raised \$1,600 to send robotics kits to girls in **Jalalabad, Afghanistan**, many of them barred from formal education. Trained local Afghan teachers on robotics curriculum to enable them to be self-sufficient
 - Partnered with Community Housing Works to deliver STEM workshops to underprivileged kids in San Diego.
 - Mentored Jamaican Team 16075 and Kentucky Team 21239, who advanced to the FTC World Championship.
- **CAD & Mechanical Design:** Designed and prototyped 6-degree-of-freedom arms, Swerve modules, Linear Slides with counter springing, and Powered Take Off mechanisms.
- **Software:** Developed advanced control systems including PID tuning, Inverse Kinematics, odometry, and OpenCV-based vision algorithms.

Intern - Northrop Grumman (High School Internship Program, HIP) [AUG 2024 - JUN 2026]

- 2024-25: Selected as one of only 140 students nationwide for a competitive engineering internship program. Engaged in webinars with STEM professionals from the company and broader industry, gaining insights into the organization as well as core engineering and design processes.
- 2025-26: Selected for the 2nd year for a hands-on engineering project at the company's campus.

Principals Student Leadership Council, Mt. Carmel High School [AUG 2024 - JUN 2026]

- One of two Junior / Senior representatives selected to serve on this committee. Advocate for key community initiatives, including campus safety, healthier school meals, bathroom hygiene, and sustainability initiatives

Superintendent Student Advisory Council, Poway Unified School District [AUG 2024 - JUN 2026]

- Sole Junior / Senior representative from my school to serve on this committee.
- Collaborated with student leaders districtwide on initiatives covering effective leadership, persuasion, empathy, and time management; advised the district on AI integration in schools.
- Expanding NextTrex store-drop-off plastic recycling initiatives district-wide.

Captain of Speech - Speech and Debate Club, Mt. Carmel High School [AUG 2022 - JUN 2026]

- Participated in 5 major tournaments so far, earning multiple top finishes
- Placed 2nd out of 75+ students at the San Diego Imperial Valley Public Forum Debate tournament.
- Selected as one of 4 students to represent my school at the District-level Rotary Speech Competition.

Generative AI program at UCLA Summer Institute [Summer 2024] (<https://bit.ly/amitesh-ucla>)

- Studied NLP fundamentals, LLM evolution, and research trends.
- Created "Quote Quest", an AI app that generates inspirational quotes and images based on user input.
- Integrated Facebook LLM Model, Glove Vector embeddings, Stability API, and Python image processing.
- Built with Python, leveraging PyTorch and NumPy. Used Google Colab for development.
- Awarded 2nd place in the final competition.

President - AI Club, Mt. Carmel High School. [AUG 2023 - JUN 2026]

- Developed hands-on lessons on regression, NLP, and LLM; created a store-drop-off plastic data set to train an AI model for assisting recycling efforts

Education

Mt. Carmel High School [AUG 2022 - JUN 2026]

GPA Weighted: 4.25, Unweighted : 3.83

- **AP:** AP Calc AB, AP Calc BC, AP Chemistry, AP Art History, AP Physics 1, AP Computer Science Principles, AP World History, AP English Language, AP Physics C Mechanics, AP Physics C E&M, AP Computer Science, AP Statistics, AP US GOV Politics, and 3 years of Spanish course.
- **Honors:** Honors Precalculus, Honors Humanities

Technical Skills

- Programming: Java, Python, Web development, PyTorch, NumPy, OpenCV, Matplotlib, PIL, Google Colab
- Machine Learning: XGBoost, LLM, NLP, sentiment analysis, word embeddings, model evaluation
- Robotics: FTC SDK, PID tuning, odometry, inverse kinematics, CAD (Fusion 360)
- Other: Public speaking, curriculum design, team leadership