

# Amitesh Senthilkumar

## Profile Links:

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

## Contact:

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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](https://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 ( Trashtalker ), to sort trash, including store drop-off plastics

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