

# Ayan Syed

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**Mission Statement:** Current undergrad and aspiring robotics engineer who owns the full stack—from CAD and PCB layout to intelligent and ML-based software control—I love turning ideas into hardware and software that moves. My projects have been tested at NASA, won robotics competitions, and educated hundreds in my community. As an Intern, I'm eager to take my prior knowledge forward in ROS, robotic modeling, inverse kinematics, and motion control to the next level on the coolest robotic platforms in the world

## Projects

### Gemini Robotic Arm

- Custom Open-Source 5DOF 3D-Printed Robotic Arm Platform. Using Python and C++, implemented OpenCV, ArUCO CV Markers, IKpy, and Gemini AI LLM API for precise pick and place using voice NLM
- Wrote custom Robot Controller, trapezoidal motion profile, and URDF used for inverse kinematics

### Autonomous RC Car Racer

- Attached Raspi 4B, Arduino, and USB Camera to a toy RC Car and used ORBSLAM3 and C++ to perform localized monocular camera-based SLAM with IMU. Achieved <5cm Precision with a PID Controller
- Currently working to integrate ROS Nav2 with Gazebo for autonomous routing and travel

### CometKitz

[cometkits.github.io](https://cometkits.github.io)

- Utilized OnShape, C++, KiCAD, and Arduino to develop an open-source robotics education platform with a custom circuit board to introduce elementary schoolers to STEM and coding. Featured on NBC Bay Area
- Presented and networked with industry and local government to secure over \$10,000 in R&D/execution funding and taught at 11 schools for free, educating ~210 students in the Bay Area.

## Experiences

### NASA L'SPACE Program

*Winter 2024 - Simulation & Applications*

- Developed FEA, MATLAB, and physics simulations on aerogel composite behavior under stress conditions
- Designed Arduino testbed rig with strain gauges and thermocouple sensors for data acquisition
- Researched KPPs in extraterritorial habitation settings with a team of 12 and co-authored a technical proposal for TRL 2 aerogel adaptation for increased thermal capacities; Also got an NX Certification

### NASA AMES

*2023 Summer Research Intern*

- Worked with 2 NASA simulation engineers to collect and analyze large open-source fuel emission datasets
- Developed effectiveness constants to evaluate the scalability of high-KV electric thrust systems for commercial long-distance aviation. Helped write documentation and testing solutions
- Paired research with exploration into technology maturity to construct a paper introducing alternative propulsion, and proposing a 30-year implementation plan; Published on N.T.R.S.

### FTC Team 8872 Robpocalypse

*2024 Team Captain & 2023 Technical Lead*

- Used Fusion360, 3D Printing, and CNC to fabricate a dual reverse linkage four-bar lift-based robot design atop a belt-drive chassis. Placed in the 2023 Top 100 World Scores
- Led team to the top 1% to advance from NorCal Region and compete at the 2024 World Championship

## Education

### De Anza College

*Computer Science - Class of 2028 - 4.0 GPA*

- Data Structures & Algorithms, C++ & Python Series, Circuit Design, O.O.P., Kinematics & Dynamics, Vector Calculus

## Skills

**Simulation:** Gazebo, MoveIt2, RViz, IKPy, MATLAB, FEA, Impedance & Torque Control, PID, Technical Documentation

**Software:** Python, C++, GitHub, Linux, ROS 2, OpenCV, NumPy, HTML/CSS, Unity3D/C#, Blender3D, Ubuntu, ML

**Hardware:** Fusion 360, Onshape, NX Siemens, CNC, 3D Printing, Linkages, KiCad, PCB Design, Motor Drivers, Arduino