



# Qingyuan (Andy) Li

Computer Science & Mathematics Student

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⇒ [Github Profile](#)

⇒ [Website](#)

## Personal Skills

Communication

Leadership+Teamwork

Strong Organization

## Technical Skills

CS Algorithms

Control Theory

Web & Application Design

Data Science

Machine Learning

Computer Vision

## Languages

Java

Python

C/C++

HTML/CSS/JS

## Frameworks

Git/Github

Tensorflow+Numpy

LibGDX/LWJGL

UNIX/Linux

OpenCV

Arduino/Raspberry Pi

## Profile

Dedicated high school software engineering student, specializing in algorithms and control theory, always eager to learn. Abundant experience in leading and working with teams, both in school and at work. Resourceful, organized, and proactive, with excellent interpersonal communication skills.

## Education

### Archbishop Mitty High School, San Jose

→ August 2019 — May 2023

- 4.737 Academic Cumulative GPA
- Scored 36 (all sections) on ACT, 1590 on SAT
- 15 Advanced Placement Courses (10 taken, all 5s)
- 2 Undergraduate Awards, General Excellence Award

## Work Experience

### Software Engineering Intern at [Parkworks](#)

→ June 2022 — August 2022

Paid summer internship; used OpenCV, Apriltags, PyQt5 and Flask with linear algebra and vector math to create a robot program—motor setpoints for a robot arm from computer vision target data and custom kinematics. Gained valuable technical and personal experience from working in a professional setting and writing documentation/communicating my process to coworkers.

## Technical Papers

[Autonomous Path Following Algorithms \[PDF\]](#)

[AprilTags Pose Estimation & Robot Program \[PDF\]](#)

## Projects

### [Path Following Libraries & Visualizer](#)

- Libraritized autonomous path following algorithms for differential drive robots using Ramsete and Pure Pursuit motion controllers
- **2D/3D path planner and visualizer** [\[link\]](#)

## Hobbies

Applied math  
Mechanical engineering  
Computer-aided design  
3-D printing  
IOT integration  
Game development  
Competitive piano

- Winner of the 2022 FRC Innovation in Controls Award

### TKO Electronics Simulator

- Java (LibGDX) app for visualizing and simulating FRC electronics wiring diagrams to assist with electronics training during COVID-19
- Winner of the 2021 KLA Software Engineering Award

### Apriltags Vision Robot Motion Planning

- **Short YouTube video of demonstration** [\[Link\]](#)
- Proof-of-concept for Parkworks internship
- Self-designed & built 3D printed XY platform

### Battle-City

- Game inspired by Namco's 1985 Battle City
- Uses shortest-path graph algorithms to generate difficulties

## Clubs/Activities

### **FRC Robotics Team 1351**

→ August 2019 — Present

#### **Software Lead** (May 2021 — April 2022)

Responsible for robot code, training new members, coordination with other leads and officers. Extensive research and development of advanced autonomous path following algorithms using Ramsete and Pure Pursuit motion planning in addition to Kalman filtering and state space for sensor fusion and pose estimation.

#### **Vice President of Engineering** (April 2022 — Present)

Leading the 80+ member engineering department (mechanical, electronics, software). In communication with leads and mentors to set goals and organize all engineering projects, and guide overall robot design, in addition to continued software work.

### **President — Mitty Math Team**

→ August 2020 — Present

Organizing and planning meetings, as well as weekly and 4 yearly competitions for Mitty's math team. Handling cooperation with school for outreach and schoolwide competitions. Weekly meetings with 30+ members.

### **Co-Lead — CS Club x Mitty Advocacy Project**

→ Sep 2020 — Present

Combining computer science and social advocacy. Projects include data collection and analysis on federal/state legislation and machine learning to find trends in mental health issues. Data used when presenting to lawmakers.

### **Tech Director — ThetaHacks**

→ May 2020 — March 2021

Co-founder and tech director of ThetaHacks, an online hackathon with 500+ participants in early 2021. In charge of tech related aspects of the hackathon, including setting up websites, organizing online events, advertising, and hosting speakers.