Qingyuan Li

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GitHub • Website • LinkedIn

Education

Massachusetts Institute of Technology May 2027
- Planned major: Mechanical Engineering with concentration in Controls, Instrumentation, Robotics
- Past coursework: Intro to CS, Multivariable Calculus, Physics Mechanics/Electricity & Magnetism
- Current coursework: Differential Equations, Linear Algebra, Solid State Chem, Design Innovation Seminar

Archbishop Mitty High School May 2023
- 1590/1600 on SAT, 36/36 on ACT (all sections), 4.7/4.0 GPA, 15 Advanced Placement exams (all 5/5)

Work Experience

Research Staff, Human-Computer Interaction Engineering Group @ MIT September 2023 — Present
- Building scanner and LCD display for adaptively tracked, interactive reprogramming of photochromic dyes
- Exploring further applications of robotics to enable human interaction with smart materials

Software Engineering Intern, Parkworks Mechanical Systems June 2022 — August 2022
- Created web controlled, multiprocess robot program using PyQt5, Flask
- Filtered camera data using OpenCV and AprilTags to create robot arm setpoints and custom kinematics
- Designed in CAD, 3D-printed, assembled proof-of-concept platform for validation testing
- Documented detailed process in internal wiki and communicated all results to coworkers

Projects (see GitHub)

Path Following Libraries & Visualizer Nov 2021 — Apr 2023
- Researched and wrote original autonomous path following algorithms for differential drive using Ramsete and Pure Pursuit motion controllers for adaptive convergence, with controllable motion profiling
- Librartized and fully documented, including all researched and original algorithms in detail

FRC Robot & Computer Vision Code Sep 2019 — Apr 2023
- Created 4-camera Apriltag localization system using Beaglebone/OpenCV and network socket comms
- Utilized state machines, motion profiles, time-based extended Kalman filter sensor fusion for state tracking
- Wrote speed-optimized autonomous sequences using custom adaptive path following modified for omnidirectional drivetrain, using asynchronous process queues and Apriltags localization data
- Guided contributions from other students, taught and documented math and concepts

TKO Electronics Simulator Aug 2020 — May 2021
- Created, packaged, distributed Java (LibGDX) app for intuitively visualizing and simulating FRC electronics wiring diagrams to assist with electronics training during COVID, with recursive error processing

Leadership & Teams

Suspension Team, MIT Formula SAE Motorsports September 2023 — Present
- Simulating vehicle dynamics in MATLAB / CAD (Siemens NX) and manufacturing of suspension system

Autonomy Team, MIT Arcturus Marine Robotics September 2023 — Present
- Working on autonomous path planning and perception with ROS2, to be used in RobotX VRX 2023

Vice President/Software Lead, FIRST Robotics Competition Team 1351 August 2019 — May 2023
- Led 80+ member engineering departments (mechanical, electronics, software) and department leads
- Responsible for robot code & design, training new members, organizing projects and setting goals

Skills

Areas: Robotics, Computer Vision, Sensor Fusion, Algorithms, Computer Aided Design, 3D Printing, Machine Shop Manufacturing, Data Science, Machine Learning
Frameworks • Languages: ROS2, OpenCV, MATLAB, Git/Github, Tensorflow, LibGDX/LWJGL • Java, Python, C/C++
Platforms: Linux/UNIX, Arduino, ESP32, Raspberry Pi, Beaglebone