

ALVIN ZHENG

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EDUCATION

Massachusetts Institute of Technology

Graduate ML, DL and RL; Graduate Computer Vision; Inference & Statistics

B.S. in Computer Science, AI/ML

EXPERIENCE

Software Engineer, SpaceX

Jun. 2025 - Sep. 2025

- Engineered high-performance **C/C++** software-based UE simulators for SpaceX's Starlink Direct-to-Cell program, deploying **Docker**-containerized fleets of 10k+ simulated devices via **Bazel** to validate SpaceX's satellite LTE protocol stack and core network integration
- Architected **LTE** L2/L3 protocol testing infrastructure enabling reliable mobile device connectivity through satellite networks, directly supporting emergency services by providing cellular services to remote/disaster-affected regions.

Firmware Engineer, MIT Motorsports Team

Jan. 2024 - May. 2025

- Lead Firmware Developer for MIT Motorsports **Formula SAE** team, spearheading firmware development for vehicle control systems, sensor interfacing, and battery management across critical electronic boards.
- Engineered a custom firmware solution integrating **GNSS** signals with inertial measurements, delivering high-resolution velocity data for calculating wheel slippage and optimizing motor torque control.

Lead Software Engineer, MIT CS & AI Laboratory

Jan. 2024 - Jan. 2025

- Engineered MantisAI, an innovative data science platform, converting raw unstructured data into interactive 2D maps utilizing LLM text embeddings and dimensionality reduction in **Python**, **React**, and **AWS**.
- Serving **Ernst & Young**, **Boston Consulting Group**, **Lumeris Healthcare**, and a variety of other high impact U.S. based companies custom data science solutions on Mantis.
- Developed a custom **Bounding Volume Hierarchy** and **Ray Marching** algorithm solution running on **WebGL** Shaders to display large-scale datasets on the Web.

PROJECTS

MantisAI (<https://home.withmantis.com/>)

- Developed a data science platform transforming raw unstructured data into interactive 2D maps through dimensionality reduction and projection techniques, utilizing a robust **Django** backend and **Next.js** frontend, deployed on **AWS**. Serving companies such as **Ernest & Young**, **Boston Consulting Group**, and more.

Omni Peripheral Controller (<https://gitlab.com/alvinzhengq/aimbot>)

- Engineered an omnidirectional chassis with an **Arduino**-based embedded system and PID control for precise movement. Integrated with an **OpenCV** endpoint to control a computer mouse, enabling automation via a physical hardware peripheral.

SKILLS

Programming Languages and Frameworks

- Languages: *C/C++, Python, Rust, Typescript, Node.js, Java*
- Frameworks: *PyTorch, Bazel, Next.js, Supabase, OpenGL, OpenCV, PostgreSQL*

AWARDS

USA Computing Olympiad - Platinum Division

Jan. 2022

Ranked in the *Top 30* out of *6000+* pre-collegiate competitive programmers nationwide.

CyberPatriot - 3x National Champion

Mar. 2019, 2022, 2023

Youth Cyber Defense Competition, testing *vulnerability remediation*, *system compliance*, and *network security*. Achieved the title of National Champion over 3 different seasons.