Brandon Shen

Belmont, CA 94002 • brandonshen123@gmail.com • + 1 (650) 609-0780 • Github • Linkedin

EXPERIENCE

Stanford SHAPE Lab — **Stanford, CA**

Research Intern — **May 2026 - Present**

- Designed and prototyped a fleet of haptic micro-robots (28mm omnidirectional undercarts with magnetically-coupled tokens) for a CHI 2027 sports education interface, validating mechanical drive train and coupling design through iterative SLA/FDM fabrication
- Engineered the complete electrical system in KiCad for two custom wireless PCBs per robot (nRF52832 MCU/radio, motor drivers, optical localization, capacitive touch, and haptic feedback), including RF antenna matching and power architecture for battery operation
- Diagnosed and resolved a critical drive-train failure by isolating root cause to axle rigidity rather than surface friction, avoiding an unnecessary design pivot and accelerating the prototyping timeline
- Architected the fleet coordination system (fixed-ID pairing, Raspberry Pi host, radio protocol) supporting 4–5 simultaneously operating robots with real-time localization and collision avoidance

Verdant Robotics — **Hayward, CA**

Robotics Engineering Intern — **Jun 2025 - Aug 2025**

- Designed and fabricated a modular gantry-style motorized test track from the ground up, integrating mechanical, electrical, and control systems to support continuous 24/7 operation
- Developed the complete mechanical system in Onshape using DFM/DFA principles and FEA validation, optimizing for manufacturability, structural rigidity, and ease of assembly
- Engineered and implemented a high-power electrical system capable of reliably driving a 100+ lb payload at 5 mph, with integrated safety features and efficient power distribution

EXTRACURRICULARS

Deep Blue Robotics(FRC 199) — **Belmont, CA**

Chief Technical Officer (Co-Captain) — **May 2025 - Jun 2026**

- Own technical roadmap and systems architecture for a 120lb competition robot, making final decisions across mechanical, electrical, and software subsystems
- Coordinate cross-functionally across sensing, actuation, programming, and fabrication teams to maintain design coherence from requirements through competition
- Establish and enforce mechanical and electrical standards; mentor and train junior engineers in DFM/DFA principles, GD&T, and design review processes
- Led robot architecture definition for 2025 season, translating competition requirements into integrated system design; team placed 8th of 55, becoming alliance captain
- Served as primary developer for end effector and elevator subsystems in Java across two competition seasons, implementing PID control loops for precise motor positioning

Carlmont ARC Team — **Belmont, CA**

Lead Engineer — **Nov 2025 - Apr 2026**

- Owned complete rocket systems design from the ground up: airframe geometry, mechanical layout, ejection and recovery system, on a self-funded team with no faculty mentorship
- Conducted flight modeling and performance analysis in OpenRocket, iterating on motor selection and mass distribution to hit the target apogee within competition margins
- Diagnosed and resolved ejection charge failure between ground test and launch through systematic failure analysis and hardware iteration under time pressure

Carlmont GENESIS Club — **Belmont, CA**

Head of Engineering — **Oct 2024 - Apr 2025**

- Directed engineering initiatives across competitions, developing training and quality control standards, resulting in the team gaining a top-10 finish at BARSO in its rookie year
- Self-built two robots for EV and Robot Tour using Onshape, and DFA principles, resulting in finalist finishes

- Designed a fully mechanical prosthetic leg applying biomechanics research to achieve reliable lower-limb function under anatomical load and range-of-motion constraints without powered actuation, receiving the CONRAD Innovator Award, top 15% globally

Carlmont NASA App Development Team **Belmont, CA**

Software Developer **Oct 2024 - Dec 2024**

- Developed an ML-based priority algorithm for antenna selection using Pytorch, Numpy, Unreal, and OpenMeto, leading to more accurate link budget calculations than what was expected by accounting for more variables than provided.

PROJECTS

Search Vision - Personal Project **Sep 2024 - Present**

- An end-to-end computer vision pipeline that generates custom YOLOv8 object detection models from a single text query, combining automated web scraping, dataset curation, and model training into a unified system.
- Published accompanying whitepaper. (**FastAPI**, **PyTorch**, **YOLOv8**, **SKLearn**, **Google Cloud API, Bing Search API**)

OPEN SOURCE CONTRIBUTIONS

Mattermost **Jun 2024 - Aug 2024**

- Contributed a series of frontend fixes, resolving multiple issues raised by Mattermost (**React, TypeScript)**

WPILib **Aug 2024 - Oct 2024**

- Worked on the Java version of WPILib, contributing logger improvements to version 2025.2.1

PAST RESEARCH

Ansatz Design for Mitigating Barren Plateaus in Few-Qubit QNNs: An Efficiency-Driven Approach - Personal Research **Nov 2025 - Present**

- Co-authored and submitted a review paper investigating ansatz design approaches for mitigating barren plateaus in few-qubit QNNs

TECHNICAL SKILLS

- **Mechanical:** CAD(Onshape, Fusion 360), DFM/DFA, GD&T, CAM, CNC Machining, 3D Printing(SLA/FDM)
- **Electrical:** KiCad, PCB Design, Microcontrollers(Raspberry Pi, Arduino, nRF52832), Soldering
- **Programming/Control:** PyTorch, NumPy, scikit-learn, YOLOv8, ROS(Robot Operating System)
- **Developer Tools & Systems:** Git, GitHub, Docker

EDUCATION

Carlmont High School **Belmont, CA**

High School Diploma **Aug 2023 - Jun 2027**