

Brandon Tsui

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EDUCATION

Stony Brook University

Bachelor of Engineering in Mechanical Engineering

Stony Brook, New York

Expected May 2029

TECHNICAL SKILLS

CAD/CAE: SolidWorks, ANSYS, Finite Element Analysis (FEA), aerodynamic simulation, engineering drawings

Engineering: Aerodynamics, structural analysis, prototyping, subsystem design, mechanical testing, design iteration, technical documentation

Tools: MATLAB, Microsoft Excel/Google Sheets, PowerPoint, Word

EXPERIENCE

RedRacing Formula SAE Aerodynamics

Stony Brook, New York

Aerodynamics Design Member

January 2026 - Present

- Designed a multi-element rear wing in SolidWorks for a Formula SAE vehicle, balancing downforce generation, packaging constraints, support geometry, and manufacturability.
- Ran structural FEA and ANSYS simulations to evaluate aerodynamic performance, identify stress concentrations, and iterate support geometry.
- Researched airfoil behavior, angle of attack, multi-element wing interaction, and mounting load paths to support aerodynamic design decisions.

Aviation High School

Queens, New York

FAA Part 147 Aviation Maintenance Coursework

September 2021 - June 2025

- Gained hands-on aviation maintenance experience across aircraft systems, powerplant components, propellers, fluid lines, fittings, corrosion control, and fuel-system inspection.
- Performed engine top-overhaul procedures, engine run-up checks, general visual inspections, and maintenance logbook documentation in accordance with aviation safety practices and 14 CFR Part 43.

Fulcrum GT

Chicago, Illinois

Product Manager, Summer Startup Program Participant

June 2026 - Present

- Serving as product manager on a 6-person team building a startup product for eBillers, organizing weekly sprint plans, task ownership, deadlines, and team priorities.
- Translating customer-need and competitor research into product requirements, validation criteria, and MVP direction while coordinating weekly progress against project goals.

Stony Brook Robotics Team - MATE ROV

Stony Brook, New York

Mechanical Design Member

September 2025 - Present

- Designed a detachable float subsystem in SolidWorks for a module intended to separate from the ROV and descend to a target depth during 2026 MATE mission tasks.
- Converted subsystem requirements into CAD revisions, mounting constraints, and build-ready updates to support fabrication, integration, and mission reliability.
- Coordinated float design around competition mission requirements, depth-control constraints, subsystem separation, and manufacturable mounting geometry.

Overclock Robotics

Flushing, New York

Summer STEM Course Instructor

July 2025 - August 2025

- Taught SolidWorks and robotics concepts to students building original robot prototypes through CAD lessons, design walkthroughs, and hands-on activities.
- Guided students through mechanical design decisions, prototype planning, and real-world robotics applications while reinforcing clear design reasoning.

PROJECTS

VEX Robotics High Stakes Competition Robot

Flushing, New York

Mechanical Design Project

Aug 2024 - May 2025

- Designed a two-bar arm and conveyor scoring system, iterating arm geometry, conveyor routing, intake packaging, and motion paths to improve scoring consistency.
- Balanced mechanism reach, intake handoff, driver-control requirements, cycle speed, and match reliability across autonomous and driver-controlled periods.

MEC 101 Frog Jumper Robot

Stony Brook, New York

Mechanical Design Project

Nov 2025 - Dec 2025

- Modeled and built a jumping mechanism using a 5:1 rack-and-pinion gear train, slip gear timing, linear slide, and rubber-band energy storage to drive a ground puncher.
- Integrated Arduino-based IR target detection, ultrasonic stopping near 5 cm, H-bridge motor control, mecanum-wheel turning, and caster-supported stability for autonomous target approach.

LEADERSHIP & AWARDS

Overclock Robotics

Flushing, New York

Captain

September 2021 - May 2025

- Led task delegation, design reviews, and competition preparation for a competitive VEX robotics team.
- Earned a New York State Champion title, ranked 12th at VEX Worlds, and received New York State Assembly recognition.