Benson Cao

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Education

Boston University, College of Engineering **Expected May 2026**
Bachelor of Science, Mechanical Engineering w/ Aerospace Concentration GPA: 3.43/4.00

Skills

Software: SolidWorks, OnShape, MATLAB, C++, Arduino IDE, KiCAD, XFOIL, OpenVSP, COMSOL, MS Office, Xcode | **Machine:** 3D Printer, Laser Cutter, Soldering Iron, Lathe, CNC/Manual Mill, Power Drills, Band Saw, Manual Tap | **Language:** English (Fluent), Vietnamese (Conversational)

Relevant Coursework

- Aircraft Design, Aerodynamics, Vibrations, Robotics, Electromechanical Design, Heat Transfer, Dynamics, SolidWorks, Thermodynamics, Fluids, Circuits, Instrumentation, Structural Mechanics, Manufacturing Processes

Technical Work Experience

aKin AI **Haymarket NSW, Australia**
Mechanical Engineering Intern Feb 2024 – May 2024

- Redesigned exterior shell and internal mounting structure of a stationary home assistant robot companion.
- Sketched multiple designs, modeled concepts using CAD (OnShape), created 3D renderings for presentation, fabricated parts (3D printing and laser cutting), and presented progress through daily SCRUM stand-ups.
- Enhanced aesthetics and accessibility for user interaction, increasing internal capacity for larger components.
- Adapted designs to evolving project requirements, implementing modular iteration and prototype deployment.
- Produced 3 external shell prototypes, 2 internal housing models, and a comprehensive technical report.

Engineering Projects

Technical Portfolio: https://bensoncao8.wixsite.com/portfolio

Mini Vertical Takeoff and Landing (VTOL) Flight Vehicle Sep 2025 – Present

- Designed an ultra-light VTOL aircraft (< 10 g, < 250 cm^3) with autonomous 3-axis flight carrying a 1g payload.
- Led a team of 4 in developing a custom PCB schematic and design wiring (KiCAD), coaxial rotor propulsion structure, dual-thrust vane control, closed-loop flight software (Arduino IDE), and financial documentation.
- Performed propulsion and electrical component tests to ensure thrust and battery performance.
- Created full vehicle sketches, 3D CAD models and assemblies, and physical prototype for a flight competition.

Robotic Recycling Arm Feb 2026 – Present

- Designing and building a robotic sorting arm with 3 revolute joints and a prismatic end-effector, integrating a claw mechanism with force sensors to grasp and sort recyclable items via MATLAB code and Arduino IDE.
- Implementing OpenCV computer vision using a camera to detect and classify bottles vs cans for recycling.

Nonlinear Mechanical Oscillator Analysis Jan 2025 – May 2025

- Designed and implemented a transduction system and procedure using a linear potentiometer to measure frequency response of a nonlinear spring-mass oscillator.
- Analyzed system behavior under step and sinusoidal inputs using MATLAB (FFT, Butterworth filtering) to extract natural frequency, damping ratio, and resonance characteristics.
- Calibrated sensor output and modeled system dynamics via 2^{nd}-order differential equations, magnitude ratio vs frequency graphs, and phase lag plots.

Cartesian Motion Painter Sep 2024 – Nov 2024

- Constructed a 2.5 DOF cartesian motion system to receive online image tool paths, draw outlines, and paint.
- Led a team of 5 in conceptual sketching of overall project, end effector design (SolidWorks), image to G-Code programming (Inkscape, JSCut, MATLAB), final part assembly, and digital recordkeeping.
- Implemented G-Code parsing and tool path allocation logic, integrating automated paint re-dipping sequence.
- Fabricated end effector to switch marker and brush contact accurately over thousands of motor rotations.

Activities and Honors

College of Engineering Dean's List (3.00+ GPA, Top 30% Eng Students)
Boston University Vietnamese Student Association | Member Sep 2022 – Present
Activities: Basketball, Bodybuilding, Tennis, Pickleball, Travelling, Hiking, Rock Climbing