

CAMDEN BOSTON

R&D Mechanical Systems Engineer | Electromechanical Development

Oakland, CA | camdenboston@gmail.com | linkedin.com/in/boston-573

Mechanical systems engineer developing hardware through design, instrumentation, modeling, integration, and testing. Experience includes technical project leadership and a technical foundation in robotics and nonlinear controls.

Professional experience

Sandia National Laboratories — Livermore, CA

Oct 2023–Present

R&D Systems Engineer — Flight Test Team

- Designed and load-tested a below-the-hook strongback lifting device to withstand a 3,500-lb load. Analyzed load paths and pin shear, led drawing creation, made all GD&T decisions, and performed tolerance stack-ups.
- Redesigning a welded vertical pedestal fixture as a machined main body, balancing stiffness, mass, height, and access. The fixture passed dynamic load testing and eased test-article installation.
- Led separation shock test development from test design through execution and stakeholder acceptance; designed hardware for a custom pressure-actuation system, made drawing/GD&T decisions, and coordinated fabrication and assembly.
- For separation shock testing, selected accelerometers and pressure sensors, configured and operated DAQ, and developed assembly/test processes with the team.

Purdue University — Mahmoudian Lab

Aug 2022–Jun 2023

Professional Research Assistant — Underwater Robotics

Worked on underwater-glider hardware. Wrote C++ software communicating with a microcontroller for actuator, servo, and pump control, and developed an HTML command interface. Selected servo and pump motors.

Sandia National Laboratories — Graduate Intern

May–Aug 2022

Fixture design and fabrication, test-protocol development, instrumentation planning, and mechanical load analysis.

General Motors — EXCEL Intern

Summers 2020 & 2021

Coordinated studio and engineering teams on Cadillac EV integration design in 2021. Developed a MATLAB GUI for drive-cycle analysis during the 2020 internship.

Selected engineering projects

Camel Bots — Mobile water-handling rover

Spring 2022

Project manager and chief engineer of a five-person team developing a mobile water-treatment prototype. Team testing drove a change from printed belt sprockets to metal sprockets and chain. Final prototype used Bluetooth control and ultrasonic sensing; autonomous field operation was not established.

Purdue Lunabotics

2018–2022

Chief engineer, 2020–2021. Personally sized drivetrain and linear actuators during involvement with the autonomous mining-robot team. Mechanism development and integration were team contributions.

Nonlinear rover controls

Fall 2022

Integrated an 18-state nonlinear rover model in MATLAB/Simulink and compared algebraic, lead-lag, full-state, and LQR control. Examined tracking behavior and controller limitations in simulation.

Tools and education

Professional: Creo, GD&T, tolerance analysis, MATLAB, ANSYS structural FEA, instrumentation, data acquisition, manufacturing coordination.

Earlier robotics/research: SOLIDWORKS, Simulink, C++, Linux/ROS, Arduino, machining and 3D printing.

Purdue University | Autonomous robotics focus

M.S. Mechanical Engineering, May 2023

B.S. Mechanical Engineering, May 2022