Andrew Zha

| Fort Collins, Colorado | (623) 760-6748 | drewzha@gmail.com **|**Github **|**

EDUCATION

University of Colorado, Boulder August 2024-Present
GPA: 3.2/4.0
Bachelors in Mechanical Engineering
Expected Graduation: Dec 2027

Front Range Community College (Dual Enrollment) August 2019- May 2023
Fort Collins, CO
Associate of Science, CAD Design Focus

WORK EXPERIENCE

ACME Lab - ATLAS Institute, CU Boulder August 2024 - Present
Robotics Researcher
Robotics Education Kit & Human-Subjects Research (Casey Hunt)

- Led mechanical design and prototyping of a **modular robotics kit** to build intuition for non-expert users across age groups.
- Designed and prototyped most kit components with emphasis on **DFM, tactile feedback, and mechanical versatility**.
- Iterated designs through user testing, refining **tolerances, ergonomics, and assembly workflows**.
- Facilitated **human-subject studies** and performed post-study data analysis; **contributing author on forthcoming publication**.

VR/AR Wing Modeling Controller (Sandra Bae)

- Designed and rendered a **VR/AR haptic controller** for intuitive airfoil sculpting in immersive environments.
- Developed a multi-DOF mechanical system with **movable discs, telescoping linkages, and integrated controls**.
- Produced high-fidelity CAD and renders for design validation and stakeholder review.

Laptop Camera Mirror Fixture (Suibi Weng)

- Designed a **precision fixture** to position a mirror for computer-vision–based keyboard tracking.
- Iteratively refined geometry for **optical alignment, compactness, and ease of installation**.

MAC Lab – Department of Mechanical Engineering, CU Boulder August 2025 - Present
Mechanical Engineering Researcher
Shape Memory Actuator (SMA) Characterization (Prof. MacCurdy)

- Experimentally evaluated **high-frequency SMA actuators**, benchmarking speed, force, and durability.
- Developed test protocols revealing **tradeoffs between actuation speed and mechanical strength**.
- Documented findings to guide future actuator selection.

Impact Mitigation Structures for Sports Safety (Aaron Finch)

- Conducted **drop testing** of impact-mitigation structures for helmet and protective equipment applications.
- Analyzed **force–time and deformation data** to link geometry with impact response and failure modes.
- Wrote a **custom testing script** to identify software failure points and automate simulations.

HIRO Lab – Computer Science Department, CU Boulder March 2025 - August 2025
Robotics & Mechanical Design Researcher
Robot Skin (Carson Kohlbrenner)

- Contributed to a **biomimetic robotic skin** enabling precise tactile localization without capacitive sensing.
- Led mechanical design of modular skin structures; cleaned and adapted models for simulation and fabrication.
- Performed **tolerance studies and iterative 3D printing** to validate fit and sensor integration.
- Applied **algorithmic modeling workflows in Blender** to route sensor layouts and wiring.
- Assembled and tested integrated mechanical–electrical prototypes with electronics-focused collaborators.

Utility Research Lab – ATLAS Institute, CU Boulder January 2026 - Present
Research Assistant
Near-Infrared Spectroscopy Plastic Scanner (Michael Rivera and Xin Wen)

- Assembled and commissioned a **NIR spectroscopy system** for plastic identification.

- Integrated electronics, optics, and software to establish an end-to-end data pipeline.
- Debugged hardware–software inconsistencies to obtain **physically meaningful spectra**.
- **Contributing author** on planned publication on low-cost NIR-based plastic classification.

OtterBox, Fort Collins, CO July 2023- December 2024

Mechanical Engineering Intern (Protolab / Tech Development)

- Set up, calibrated, and maintained a **Formlabs Fuse 1 SLS system** from factory delivery.
- Supported Protolab operations across **SLS, SLA, injection molding, and materials testing**.
- Modified production CAD and provided **materials and mechanical recommendations** to design engineers.

Key Project: Confidential TechDev Electronics Enclosure

- Served as **sole mechanical engineer** on a confidential TechDev electronics enclosure project.
- Designed **weatherproofing, locking mechanisms, and multi-surface mounting solutions**.
- Collaborated directly with senior solutions architect and delivered a **client-facing demo** that advanced project to Phase 2.

Key Project: Texture Displacement Mapping Workflow

- Independently developed a **texture displacement mapping pipeline** for knurling and image-based textures.
- Authored first internal documentation for the workflow using **SolidWorks, Photoshop, KeyShot, Materialise**.

EXTRACURRICULAR ACTIVITIES

Ramaero, CSU, Fort Collins, CO August 2023- May 2024

Lead CAD Designer for Empennage and Wing

- Placed Highest in Colorado for the 2024 AIAA DBF Competition (38th out of 107 teams nationally)
- Earned a 1st place senior design award from the CSU Engineering Advisory Board.

SKILLS

CAD & Modeling: SolidWorks (3500 hrs), AutoCAD (400 hrs), Fusion 360, Blender
Additive Manufacturing: SLS/SLA/FDM 3D Printing (3000 hrs)
Electronics & Hardware: Circuit Assembly (600 hrs), Electronics Repair (300 hrs)
Software & Data: Python (400 hrs), C#/C++/C (300 hrs)
Visualization: KeyShot (350 hrs)

CERTIFICATIONS

DAssault Assemblies
SolidWorks CSWP April 2023

Certiport
AutoCAD 2020 Professional December 2019

AIMS Community College
Additive Manufacturing Certificate May 2023

Front Range Community College
3D Printing and 3D Scanning Certificate March 2023

REFERENCES

Greg Castor, OtterBox Solutions Architect
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Casey Hunt, ATLAS Institute Robotics Researcher
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