Alex Benson

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EDUCATION

Colorado State University **Expected May 2026**

Bachelor of Science, Electrical Engineering; Concentration in Aerospace; Minor in Mathematics; 3.3/4.0 *Fort Collins, CO*

- Senator for the College of Engineering, Associated Students of Colorado State University (2022-2023)
- Chair for Engineers Without Borders: Raised $7,000 for international aid projects (2022-2023)
- College of Engineering Dean's List (FA22, SP24)

WORK EXPERIENCE

FIRST RF **May 2025 – Aug. 2025**

Embedded System Engineering Intern *Boulder, CO*

- Co-developed a half-duplex phased array system for land and maritime platform connectivity.
- Designed and optimized multilayer PCB layouts in Altium, performing transmission-line calculations and stackup tuning to ensure signal integrity at GHz-range operating frequencies.
- Authored cross-platform SPI drivers in C for Zephyr RTOS, enabling control of active RF components.
- Automated analysis of passive component performance by processing S-parameter datasets in Python, accelerating validation workflows.

Bureau of Reclamation, U.S. Department of the Interior **May 2024 – Feb. 2025**

Electrical Engineering Intern; Power System Analysis & Control Group *Lakewood, CO*

- Performed hydropower governor and excitation control system compliance testing (WECC & NERC).
- Designed and implemented a field transducer box for signal processing at power plants across the west.
- Developed custom C drivers for interfacing with 12-/16-bit Acromag DAC PCIe boards in QNX RTOS for a governor and excitation system controller.
    - Integrated Simulink model for injection into DAC channels for dynamic simulation and testing.
    - Configured shared memory for Simulink model parameter adjustment via TCP/IP using Visual Basic.
- Developed 32-bit communication protocols for STM32 controller to interface with DAC peripheral board using SPI to upgrade prior 16-bit method.
    - Established frequency injection for a digital terminal quantity transducer, achieving a readable voltage range of -10 to +10 V to process 3-phase current and voltage from a hydropower turbine.

Electrical and Computer Engineering Department, Colorado State University **Aug. 2023 – May 2024**

Learning Assistant *Fort Collins, CO*

- Provided instruction, support, and tutoring for the Digital Circuit Logic course, including 5 additional office hours each week. Topics covered include combinational and sequential logic design, Boolean algebra, and basic circuit logic principles.

Woodward, Inc **May 2023 – Aug. 2023**

Electrical Engineering Intern *Loves Park, IL*

- Researched and tested data acquisition hardware to improve the processes of the department and ultimately the testing done within the company.
- Designed and implemented a module to meet customer requirements on response tests for space hardware.
- Created a standalone Python script for rapid analysis of large data sets, enabling engineers to quickly visualize interactive graphs without need for NI DIAdem software.

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Electronic-Photonic System Design Lab, Colorado State University **Dec. 2022 – May 2023**
Undergraduate Researcher *Fort Collins, CO*

- Achieved a 75%-90% decrease in microchip measurement time, enhancing project turnaround and productivity.
    - Used Python libraries to isolate sectors of a microchip for the measurement process.

PROJECTS

NASA University Student Launch Initiative, Payload Team Lead – L2 Rocket **Fall 2025 – Spring 2026**
Senior Design Project at Colorado State University

- Leading a 4-member team to design and build a deployable payload system for a March 2026 L2 rocket launch.
- Developing a mechanism to deploy, land, collect a 50 mL soil sample, and perform on-board analysis.
- Collaborating with the vehicle team to ensure payload integration optimizes rocket performance and stability.

Arduino Monitored Ecosystem, environmental data collection system for plant growth. **Spring 2024**

- Utilized C++ to create a grab accurate environmental condition of an enclosed ecosystem.
- Enhanced this system on my own time to incorporate a feedback control system where environmental conditions would be adjusted if out of tolerance.
    - Foundational knowledge of control systems using relays.

Automated Greenhouse, robust greenhouse tent with controlled environmental parameters. **Fall 2024**

- This is a vertically integrated project (VIP) throughout the 2024 fall semester, requiring 1-3 hours/week.
- Took the original electrical design of the greenhouse control system and made it safe, efficient, and documented. Implementing the new system in the second iteration of the project.

ADDITIONAL SKILLS

- Python
- Java
- C, C++
- RTOS
- Assembly
- MATLAB
- LabVIEW
- Simulink
- Visual Basic
- AutoCAD
- Cadence
- Verilog
- TCP/IP
- Quartus Prime
- HMI Dev
- Embedded Systems
- PCB Design (RF)
- Altium
- Proteus