

Dominic Alessi

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EDUCATION

Oregon State University

Honors B.S. in Electrical and Computer Engineering, Minor in Computer Science
Accelerated Master's Program Student
GPA: 3.98, Tau Beta Pi, Engineering Honors Society Member

September 2023 – Present

Corvallis, OR

EXPERIENCE

Electrical Subteam Lead

OSU DAM Robotics Rover Club

- Trained and mentored new students through weekly meetings, design philosophy presentations, and Altium tutorials; designed a custom PCB for soldering practice.
- Led general Rover Club meetings of 40 members in the absence of the General Lead.

September 2023 – Present

Corvallis, OR

Physics Learning Assistant

OSU College of Science, Physics Department

- Facilitated office hours and recitations by answering student questions on homework and in-class assignments.
- Tutored ~30 students/session in areas ranging from kinematics and forces to electricity and magnetism.

January 2025 – December 2025

Corvallis, OR

ENGINEERING PROJECTS

Wearable Functional Near-Infrared Spectroscopy Device

- Project for Dr. V John Mathews' Information Processing Group to develop an objective measurement of cognitive workload to assess amputees' ease of use with prosthetic limbs.
- Designing an optode PCB for scalp placement that emits near-infrared light and measures reflected intensity to estimate cerebral tissue oxygenation.
- Implemented a transimpedance amplifier to convert photodiode current into measurable voltage linearly proportional to reflected light intensity.

September 2025 – Present

Rover Gimbal Camera Redesign

- Co-led gimbal camera system upgrade to improve stability by dynamically translating accelerometer data into servo motor control signals.
- Developed an ESP32 system for measuring acceleration data on existing gimbal system. Programmed dual-core operation for > 300 Hz sampling rate concurrent with microSD card logging.
- Designing an STM32-based control PCB leveraging a 480 MHz clock speed for real-time servo control.

September 2025 – Present

Isolated Word Recognition System Simulation

- Implemented a custom Mel-Frequency Cepstral Coefficient (MFCC) algorithm in MATLAB to extract identifiable features from real audio samples of isolated words.
- Applied a custom Dynamic Time-Warping (DTW) algorithm for matching extracted features to those in a set of known words.
- Jointly, the MFCC-DTW approach provides a computationally cheap method of recognizing words, making it well-suited for embedded systems with limited resources.

October 2025 – December 2025

AM Radio Transceiver PCB

- Designed and implemented complete AM transceiver circuit in a 4 layer PCB using Altium Designer.
- Integrated Wien-Bridge oscillator to generate a stable 1.6 MHz carrier frequency.
- Effectively utilized top-down design philosophy to simplify design process and work flow.

June 2025 – September 2025

Portable Oscilloscope

- Collaborated with team to design and fabricate custom oscilloscope achieving 16-bit ADC resolution and ± 15 V input range.
- Developed complete hardware solution including analog front-end circuitry, signal conditioning, and custom PCB layout optimized for 330 kHz sampling rate.
- Integrated mechanical design through 3D printed enclosure providing portable form factor while maintaining signal integrity and user accessibility.

April 2025 – June 2025

TECHNICAL SKILLS

Languages: C/C++, MATLAB, PlatformIO, Java, Python, SystemVerilog

Software: Altium Designer, Autodesk Fusion, KiCad, LaTeX, LTspice, Quartus Prime

Interpersonal: Leadership, Teamwork, Cooperation, Communication, Empathy