

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
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EXPERIENCE

Electrical Subteam Lead OSU DAM Robotics Rover Club	September 2023 – Present Corvallis, OR
• 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.	
Physics Learning Assistant OSU College of Science, Physics Department	January 2025 – December 2025 Corvallis, OR
• 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.	

ENGINEERING PROJECTS

Wearable Functional Near-Infrared Spectroscopy Device	September 2025 – Present
• 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.	
Rover Gimbal Camera Redesign	September 2025 – Present
• 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.	
Isolated Word Recognition System Simulation	October 2025 – December 2025
• 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.	
AM Radio Transceiver PCB	June 2025 – September 2025
• 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.	
Portable Oscilloscope	April 2025 – June 2025
• 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.	

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