ALFRED DU

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Education

University of California, San Diego (UCSD) — La Jolla, CA
Bachelor of Science in Electrical Engineering — Expected Jun 2028
GPA: 4.00

Relevant Coursework:
Calculus (Math 20A-E), Physics (Phys 2A-B), C Programming (ECE 15), Python Programming (ECE 18), Digital Circuits (ECE 25), Analog Circuits (ECE 35, ECE 45, ECE 65), Computer Architecture (ECE 30)

Portola High School — Irvine, CA
GPA: 4.50 (W) | Summa Cum Laude — Jun 2025

Skills

- **Programming & Software:** C/C++, Python/PyTorch, MATLAB, Verilog, Linux, OpenCV
- **Hardware & Electronics:** Microcontrollers (Arduino, ESP32, Raspberry Pi), FPGA, CAD, PCB prototyping, Oscilloscopes, Function Generators, Multimeters, Sensors, Communication protocols (I2C, SPI, UART, 1-Wire)
- **Tools:** PSpice, Fusion, EasyEDA, Vivado, Git, PlatformIO, Soldering, 3D printing

Experience

Electrical Team Member — Triton Robotics
Jan 2025 - Present — La Jolla, CA

- Designed, soldered, and tested a custom 24-5V, 3A buck converter PCB for the Infantry robot using EasyEDA, replacing a faulty buck and minimizing output voltage ripple for sensitive 5V logic components.
- Performing electrical bring-up and debugging of embedded systems using oscilloscopes and multimeters.

Digital Design Intern — ATRXIC Consulting
Jun 2024 – Jul 2024 — Irvine, CA

- Designed a Verilog RTL 8-bit signed calculator with arithmetic, logic, and shift operations, two's-complement overflow handling, and flag logic (carry, zero, overflow).
- Synthesized and implemented the design on a Xilinx Artix-7 FPGA and validated functional correctness through hardware testing and oscilloscope-based signal analysis.

Projects

Digital & Analog Systems Labs – UCSD — *Jan 2026 - Present*
Tools: Vivado, PSpice, Oscilloscope, Basys-3, Breadboard

- Designed an IR remote calculator on Basys-3 using Vivado, integrating an IR receiver, hex 7-segment display decoder, and 4-bit adder to process TV remote input.
- Conducted AC RLC circuit transient state analysis using function generator, oscilloscope, and PSpice simulation.

Quadruped Computer Vision Robot — *Feb 2026 - Present*
Tools: Python/PyTorch, MediaPipe, OpenCV, Raspberry Pi, KiCad, Fusion 360

- Developing a 4-legged robot with real-time hand gesture recognition using an LSTM-based computer vision pipeline deployed via edge computing on a Raspberry Pi.
- Designing custom power/servo PWM PCB in KiCad and chassis in Fusion 360 for full hardware integration.

Smart Calendar Gadget — *Dec 2025*
Tools: Hugging Face Transformers, PyTorch, Pandas, Flask, Fusion 360, ESP32-S3

- Fine-tuned T5-small to normalize calendar event labels at ∼90% exact-match accuracy, deployed as a Flask REST API on a self-hosted Ubuntu server.
- Designed and 3D printed a custom enclosure in Fusion 360, integrating an ESP32-S3, capacitive touch inputs, and OLED display for real-time event browsing.

Smart IoT Planter System *Aug 2025 - Nov 2025*
Tools: ESP32-S3, Fusion 360, PlatformIO, HTTP/REST, Telegram API

- Built a multi-sensor planter monitoring system in C++ with real-time data visualization and Telegram bot alerts for threshold-based notifications.
- Designed a 3-part snap-fit modular enclosure in Fusion 360 with weatherproof housing for product-grade deployment.

Work

Part-Time Tutor Private Tutoring
May 2024 – Present Irvine, CA

- Deliver personalized math and physics instruction to K-12 students, adapting methods per learner and using Desmos/MATLAB simulations to improve conceptual understanding and academic performance.

Social Media Intern Global Life Enrichment Center (GLEC)
Jul 2023 – Aug 2023 Irvine, CA

- Designed graphics and short videos using Canva and Adobe Premiere Pro, increasing viewership by over 100% for the nonprofit's global outreach projects.