

Rick Unite

Electrical & Computer Engineering graduate eager to contribute and grow in a full-time engineering role

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EDUCATION

California State Polytechnic University, Pomona

Aug 2022 – May 2026

- **Major:** B.S Electrical Computer Engineering
- **Relevant Coursework:** Circuit Analysis, Digital Logic Design (Verilog), Signals & Systems, Control Systems Engineering, Data Structures & Algorithms

WORK EXPERIENCE

Electrical Engineering Intern — EEL-Drone, Pyro-E

Jun 2026 – Sept 2026

- Integrated six sensing, perception, navigation, control, and visualization nodes into a modular Python autonomy stack on a Raspberry Pi 5, capturing complete sensing-to-command pipeline outputs across 36 recorded test sessions.
- Engineered Ping360 object/gate and wall perception using DBSCAN clustering and RANSAC; in a selected recorded-data evaluation, maintained one object track across 18 consecutive sweeps with 7.05 cm positional standard deviation.
- Diagnosed a water leak from a mis-tapped bulkhead penetration through visual inspection after multi-hour test sessions (up to 3 hours); resolved it by re-sealing O-rings, vacuum-sealing onboard electronics, and applying anti-rust treatment to protect hardware from water intrusion.
- Developed sonar-based pool localization using ICP scan registration and geometric validation against a known 15.24×7.62 m pool, enabling ROV position estimation from Ping360 data alone, without a Doppler Velocity Log (DVL).
- Integrated a MicroStrain 3DM-CV7-AR IMU with PID heading control, achieving 1.4° mean absolute heading error and maintaining error within $\pm 2.6^\circ$ across two recorded straight-drive trials.
- Designed and built the ROV's electrical system around a Raspberry Pi 5 and 2 L298N motor drivers, engineering regulated 5V/18V power rails to support onboard sensing, compute, and propulsion electronics.
- Built a structured mission-data recording and Synching synchronization pipeline capturing raw sonar, IMU heading, waypoint commands, estimated ROV position, autonomy decisions, motor telemetry, and control errors in timestamped JSON/JSONL logs, enabling offline replay and diagnostics across 472 sonar scans from 54 sessions.
- Designed and 3D-printed custom motor mounts and a Ping360 sonar mount in Fusion 360, inverting the sonar at the ROV's bow for forward-facing scans and angling the motor mounts diagonally to improve turning efficiency.

IT Intern — CHINT Power Systems

Jun 2025 – Aug 2025

- Documented IT procedures and created internal guides to streamline onboarding and technical support.
- Gained hands-on experience with cloud tools, device imaging, and Windows administration using VNC Viewer and SysAid.
- Supported IT operations including hardware deployment, software updates, user account management, and printer setup.

Computer Systems Administrator — Marathon Petroleum

Oct 2023 – May 2025

- Collaborated with a 6-person team to roll out a refinery-wide intranet, reducing page-load times by 40% for 150+ operators.
- Imported and exported SharePoint data into Excel to support Power BI dashboards used for weekly safety-report generation.
- Reviewed and migrated hundreds of operational forms from the legacy intranet to the new site, ensuring content accuracy during transfer.

PERSONAL PROJECTS & EXTRACURRICULARS

Cat Heart Rate Monitor Harness

Nov 2025

- Designed a wearable ESP32-based heart rate monitor harness for a cat using an INMP441 MEMS microphone to detect rhythmic chest vibrations and stream real time metrics over ESP-NOW
- Purpose was to create a non-invasive, mobile method of measuring a cat/animal's heartbeat wherever they are at any given moment.

BB8 Robot

Oct 2025

- Engineered a BB-8 inspired rolling robot using a dual motor internal drive system with magnetic stabilization to control orientation inside a spherical shell
- Designed and tested the motor control architecture using an ESP32, BTS7960 motor drivers, Li-ion battery system, and created a joystick-based remote control using WiFi/ESP-NOW

Magic Mirror (Smart Mirror)

Dec 2021

- Deployed a Raspberry Pi as the core processor with Raspbian OS to display real-time news, weather, and time through a custom-built two-way glass enclosure with a repurposed LCD monitor.

TECHNICAL SKILLS

- **Programming:** Python, C/C++, C#, Java, MATLAB, HTML/CSS (Web Design)
- **Hardware & Embedded Systems:** FPGA (Xilinx Nexus A7-100T), Circuit Design & Soldering, Raspberry Pi, PIC18F4620 Microcontroller, Linux/Raspbian
- **Design & CAD Tools:** AutoCAD, Fusion 360, KiCad, Cadence, Blender, Unity, Microsoft Office