Aden Tan

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EDUCATION

University of California, San Diego **Expected Spring 2027**

B.S. Electrical Engineering

- **Relevant Coursework:** Circuits and Systems, Introduction to Analog Design, Introduction to Active Circuit Design, Advanced Digital Design Project, Power Systems Analysis and Fundamentals

TECHNICAL SKILLS

Hardware: Soldering, circuit prototyping, sensor interfacing, motor drivers, power distribution, 3D printing
Programming: C, C++, Python, MATLAB, Verilog
Platforms and Tools: Arduino, ESP32, Raspberry Pi, ROS2, Altium, LTspice, SolidWorks, Onshape

PROJECTS

Pinball Machine | **Hardware Lead** Winter 2026 – Spring 2026

- Led hardware integration of an Arduino Mega pinball machine with solenoid flippers, a servo gate, IR/piezo sensors, gear motors, score/lives displays, and audio feedback.
- Designed and tested MOSFET driver circuits with flyback protection; integrated sensors and SN74HC595-based displays.
- Resolved actuator-related brownouts by separating the regulated 5 V electronics supply from the 12 V motor and solenoid supply.

RoboButler | **Hardware Integration** Spring 2026 – Summer 2026

- Integrated Raspberry Pi-to-Arduino Mega USB serial communication for gesture-controlled compartment and scissor-lift actuation on an AprilTag-following rover prototype.
- Developed Arduino control for servo positioning and stepper-driven lift extension/retraction; navigation and gesture subsystems were tested separately.
- Wired the DRV8825 driver and actuator power distribution; troubleshot serial communication, motor response, and driver overheating.

Autonomous RC Car | **Hardware Integration & Navigation** Spring 2026 – Summer 2026

- Integrated Raspberry Pi 5, OAK-D Lite, VESC, RTK GPS, and power hardware for DonkeyCar driving, GPS waypoint navigation, and ROS2 lane following.
- Collected driving data, trained a TensorFlow steering/throttle model, and calibrated HSV lane detection and camera alignment.
- Isolated faulty GPS hardware through component substitution and tuned PID gains and speed, helping the team complete three autonomous GPS-guided laps.

Postura | **Electronics Lead** Winter 2026 – Spring 2026

- Integrated an ESP32, VL53L5CX 8x8 time-of-flight sensor, and a transistor-driven vibration motor for a chair-mounted posture-feedback prototype.
- Tested upright, mild-slouch, severe-slouch, and leaning-back states; helped develop and test pulsed and continuous vibration feedback.
- Supported wiring, power setup, and physical mounting; conducted customer interviews to inform the form factor and feedback approach.

StudyBand | **Personal Project** Fall 2025 – Winter 2025

- Co-developed a wearable study tracker; ported ESP32 firmware to PlatformIO in VS Code and implemented accelerometer data logging.
- Collected 70 labeled motion recordings and analyzed magnitude and pitch/roll features to tune thresholds for phone pickup, active study, and stillness.
- Collaborated on wearable-to-computer integration, with Python-based classification and scoring and MQTT delivery of session results to a leaderboard.

EXPERIENCE

Independent Math Tutor Summer 2026

- Provided remote Algebra I tutoring to high school students, explaining mathematical concepts and problem-solving methods through one-on-one and small-group sessions.
- Guided students through coursework and practice problems while adapting explanations to individual learning needs.

FIRST Robotics Team 6220, Golden Griffins Summer 2022 – Spring 2023

- Designed drivetrain and body-frame components in SolidWorks; led a robot transport-cart subproject under material constraints and organized CAD components to track fabrication status.