Jonathan Olvera-Aguilera

Electrical Engineering · Embedded & Robotics

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Sophomore EE student building robotics hardware: rigid-flex and 6-layer controlled-impedance PCBs, Zephyr/ESP-IDF firmware, and board bring-up. Electrical co-lead across three UMass Robotics legged robots; operator on CircuitHub's factory-scale PCB assembly robot.

EXPERIENCE

UMass Robotics • *Electrical Engineering Co-Lead* · Amherst, MA 2025–Present

- Co-lead electrical engineering across three legged robots: Rover (quadruped), Wobble (biped with interchangeable foot and wheel ends), and ShoeMass (biped shoe-testing platform).
- Rover: review every PCB the team develops, finalize the Mega-CAN gateway and its CAN 2.0B migration for RobStride 02 actuators, and lead final integration testing.
- ShoeMass: guide a five-person electrical team (two on foot-sensor force mapping, three redesigning Mega-CAN as V2) on a platform built with Prof. Hubert's lab and industry footwear partners.

CircuitHub • *Production Operator* · South Deerfield, MA 2025–Present

- Operate The Grid, CircuitHub's factory-scale PCB assembly robot (paste printing, pick-and-place, reflow, and inspection on levitating movers); clear its interventions, from head faults to routing and placement errors, by hand or in software.
- Program Ersa selective soldering, troubleshoot jet printers, and handle hand soldering, board washing, parts receiving, and shipping.
- Helped prototype Data Matrix scanning (now standard over QR codes), own the ILS nozzle-label supplier relationship, and designed a three-axis gimbal mount that fixed Basler camera focus failures.

PROJECTS

Mega-CAN Gateway • *Co-designer, UMass Robotics* · in progress 2025–Present

- Designed a 6-layer Altium board (JLCPCB 3313 stackup) for a PIC32CZ Gigabit Ethernet-to-CAN gateway: length-matched GMII to a KSZ9031 PHY; 90/100/120 Ω USB, Ethernet, and CAN differential pairs. Reviewed by an Amazon Robotics mentor.
- Ported Zephyr's GMAC driver to PIC32CZ and built bring-up apps (PHY probe, ping/UDP echo). Fabricated; bench bring-up in progress.

ClearNote: Rigid-Flex ESP32-S3 E-Ink Notepad • *Sole Engineer* 2024–Present

- Designed a 4-layer rigid-flex PCB (2L dynamic flex); sized the bend to 50× thickness and 0.45% copper strain from IPC-2223, reconciling three standards that disagreed by 7.5×.
- Architected a seven-sheet system: USB-C power path, buck-boost and LDO rails, SGTL5000 codec, 3.7″ e-ink, 33-key matrix, microSD, TMR lid sensor.
- Caught 20+ defects in a pre-fab datasheet audit, including a wrong buck-boost feedback divider (3.3 V overvoltage).
- Writing ESP-IDF/FreeRTOS firmware with per-peripheral drivers; fabrication pending.

Robotic Torque Actuator • *Personal Project* 2026

- Designed a quasi-direct-drive actuator in Fusion 360 across five revisions: a 6:1 double-helical planetary stage with three planets, raising 0.37 Nm motor torque to ~2.2 Nm continuous and ~3 Nm peak at 20 A (calculated).

EDUCATION

University of Massachusetts Amherst • *B.S. Electrical Engineering* · Amherst, MA Expected 2029

SKILLS

Firmware	PCB	Build
C/C++, Python	Altium, KiCad	Hand soldering and rework
Zephyr, ESP-IDF, FreeRTOS	Rigid-flex stackups (IPC-2223)	SMT, reflow, selective solder
ESP32-S3, PIC32CZ, Jetson	6-layer controlled impedance	Fusion 360
CAN 2.0B, Gigabit Ethernet (GMII)	Differential pairs, length matching	3D printing, laser cutting
SPI, I^2C, I^2S, UART	Power path and rail design	Sheet metal

English native, Spanish fluent · U.S. citizen