Zackery Wilkinson

Electrical Engineering | Mixed-Signal Hardware - PCB Design - Embedded Hardware

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01 / SELECTED ENGINEERING PROJECTS

DSP Hardware Platform - Mixed-Signal Audio PCB, Revisions 1-3

- Designed and assembled three generations of a mixed-signal audio platform, progressing from a six-layer Teensy 4.1 board with four codecs to a simplified CS42526 platform and a standalone architecture using a bare i.MX RT1062, CS42526, and ESP32.
- Completed end-to-end Rev 2 bring-up and functional validation: verified codec communication and configuration, synchronized 48 kHz digital-audio clocking, produced buffered analog sine-wave output, and drove an external amplifier and speaker through RCA.
- Diagnosed and corrected a firmware data-path corruption fault, then used bring-up findings to improve clocking, analog interfaces, grounding and layout, debug access, power sequencing, subsystem isolation, USB/UI integration, and testability. Rev 3 was assembled; power-up and functional validation are pending.

600 W Class-D Amplifier + DSP - Six-Layer Pre-Fabrication Design

- Developed a six-layer integrated audio platform using dual TPA3255 Class-D power stages, an ADAU1467 DSP, PCM3168A codec, ESP32-S3 control, and four BTL output channels targeting approximately 150 W per channel.
- Analyzed the 48 V power network, PDN and inrush behavior, bulk-capacitance tradeoffs, high-current copper geometry, return-current paths, and mixed-signal/Class-D layout constraints; revised the power, protection, and PCB architecture based on the results.
- Designed around staged first-power bring-up, subsystem isolation, test access, assembly constraints, and manufacturability before fabrication. Hardware fabrication and functional validation have not yet been completed.

Automotive Audio CAD & Fabrication - 2001 Honda Accord

- Developed a scan-to-CAD workflow for custom A-pillars, speaker adapters, and tweeter mounts using sectional 3D scanning, manual scan alignment, mesh reconstruction, Fusion 360, and iterative FDM-printed fitment.
- Took a 6.5-inch door-speaker adapter through 10-20 design revisions to resolve window-track clearance, fastener tolerances, threaded inserts, material selection, printability, and finishing; produced and sold approximately 10 finished units at about $30 each.

02 / TECHNICAL SKILLS

Hardware Design - Mixed-signal and high-current PCB design / Multilayer PCB layout / Power distribution and PDN planning / Clocking / Grounding and return-current paths / Design for bring-up, debug, test access, and manufacturability

Embedded Hardware & Digital Interfaces - Teensy 4.1 / ESP32 / ESP32-S3 / i.MX RT1062 board integration / I²C / I²S / TDM / Digital-audio codec configuration

Engineering Tools - KiCad / Fusion 360 / LTspice / SPICE simulation / Blender / Digilent WaveForms

Lab & Fabrication - Oscilloscope / Digital multimeter / Logic analyzer / Digilent Analog Discovery / Bench power supply / Board bring-up and mixed-signal debugging / Hand and SMD soldering / Hot-air and PCB rework / FDM 3D printing / 3D scanning

03 / EDUCATION

Dallas College

Electrical Engineering Transfer Pathway - Starting Fall 2026

Plainview High School

High School Diploma

04 / PROFESSIONAL EXPERIENCE

Signature Detailing / Team Lead / Detailer

Kennewick, WA - Dec 2024 - Aug 2025

- Led small on-site teams, assigned work, trained new employees, prepared job-specific equipment and materials, and performed final quality inspections.
- Managed customer walkthroughs, progress updates, final vehicle handoffs, payment collection, and before-and-after documentation.

YMCA / Childcare Assistant

Washington - Jan 2024 - Jul 2025

- Supervised children during daily programs and field trips, maintained safety and accountability, developed activities, redirected routine behavior, and communicated end-of-day updates to parents.