

# Ashwin Kuppahally

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## EDUCATION

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### The University of Texas at Austin

Austin, TX

*Bachelors of Science, Electrical & Computer Engineering and Biomedical Engineering*

*May 2028*

- Relevant Coursework: Circuit Theory, Embedded Systems, Signals and Systems, Computer Architecture

## EXPERIENCE

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### Hardware Engineering Intern

January 2026 – May 2026

*SpaceX*

*Hawthorne, CA*

- Designed a mission-critical **10kW high-voltage converter board in Xpedition**, implementing triple redundancy and a 4-phase architecture to reliably power a satellite optical payload.
- **Led EMI/EMC qualification testing** (conducted and radiated emissions/susceptibility), collaborating with mission managers and satellite engineers to present data to government clients and secure flight approval.
- Troubleshoot a direct-to-cell RF phased array panel using **CDMA testing and spectrum analysis**; analyzed the FPGA-to-antenna signal chain to root-cause a **5% production failure rate** to faulty bare-die wire-bonded LNAs, driving corrective action with the supplier.
- Investigated precision power converter failures on a modem controller, **tracing a 33% first-pass failure rate** to BGA micro-bridging from a faulty solder stencil; spearheaded the transition to a new contract manufacturer, resulting in a significant improvement in production yield.

### Hardware Design Engineer

Aug 2024 – Present

*Longhorn Racing Electric FSAE Team*

*Austin, TX*

- Designed a high-voltage battery management board using a **Tesla ADBMS chip** to monitor cell voltage and temperature, incorporating low-pass filters for accurate cell voltage measurement.
- Implemented **isolated communication via isoSPI** and developed functionality to support **cell balancing**
- Designed and manufactured a PCB for charging 6.6 kW electric racecar battery from the ground up, capable of **charging 600 V pack**, to increase future charging compatibility and decrease complexity of battery electronics
- Engineered custom boost/buck converters **achieving 98% efficiency** for low-voltage systems, and led hardware validation efforts including root-cause diagnosis and PCB rework to resolve design errors.
- Developed **STM32 firmware utilizing CAN/SPI protocols** to manage battery sensors and user feedback, while implementing the J1772 charging standard with digital logic for precise vehicle state detection.

### Humanoid Robotics Electrical Engineer - Employee #4

November 2024 – Jun 2025

*Feather Robotics*

*Palo Alto, CA*

- Designed a centralized **PCB in Altium** after identifying a critical customer pain point in fuse accessibility, consolidating fuse locations and integrating robot control systems, **improving safety and serviceability**
- Integrated control system circuitry while optimizing power electronics, signal integrity, and space constraints
- Cut PCB manufacturing costs by **50%** by sourcing components and establishing turnkey production processes
- Designed an **IEEE and UL-compliant** electrical system, defining the overall architecture, interconnects, and safety features (breaker placement, shutdown system)
- Engineered a custom harness that reduced wiring complexity by **30%**

## PROJECTS

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### 25kW Automotive Motor Inverter | *KiCad, PLECS*

May 2025 – Present

- Engineered a custom 3-phase motor inverter for an EV hub motor in KiCad, designing custom gate drive, current sensing, and isolated power topologies to effectively switch Silicon Carbide (SiC) FETs.
- Optimized power stage stability and mitigated FET ringing by validating designs in PLECS and implementing advanced layout techniques such as interleaved power planes and tuned DC link capacitance.
- Implemented critical high-voltage safety features, including discharge circuits and physical isolation, while optimizing the BOM and thermal interfaces to reduce turnkey assembly costs and improve heat dissipation.

## TECHNICAL SKILLS

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**Skills:** PCB design (Altium, Xpedition), embedded systems software (C, C++, Verilog), CAD (Solidworks, Onshape, AutoCad), Spice simulation, wireless chip communication/telemetry (BLE, 5G), electronics manufacturing, PCB rework/soldering, 3D printing, composite materials, Python, MATLAB, Simulink, LabView