

Akanksha Mukesh Patil

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Education

MS in Electrical and Computer Engineering, San Diego State University, CA (GPA: 3.46/4) Aug 2023 - May 2025
B.E Electronics and Telecommunications Engineering, University of Pune, INDIA (GPA: 3.46/4) Aug 2019 – May 2023

Technical Skills

Technical Knowledge: Circuit Design, DC/DC, FMEA, PCBA, Root Cause Analysis, DAC/ADC, Arduino, ESP32, CAN, I2C, SPI

Design & Simulation Tools: MATLAB, LTSpice, Keysight ADS, Ansys HFSS, Cadence Virtuoso and PowerSI

Circuit & PCB Design: Altium, gate driver design, EMI/EMC filters, PCB bring-up and validation

Lab & Test: Multimeter, Oscilloscopes, power analyzers, soldering, thermal and EMI testing, Python-based lab automation

Experience

Field Application Engineer Intern, Renesas Electronics America – Chicago, IL May 2024 – Aug 2024

- Reduced current consumption of ZMID4200 inductive position sensor by designing wake/sleep timing mechanism using GreenPAK.
- Conducted extensive testing and validation to optimize sensor performance under dynamic operating conditions.
- Partnered with clients to troubleshoot technical issues, provide customized solutions, and creating block diagrams for system design.

Teaching Assistant, SDSU – San Diego, CA Jan 2024 – Aug 2025

- Teaching and managing labs on Electricity and Magnetism, covering core concepts like electric/magnetic fields, circuit elements.

Electrical Engineering Intern, SDSU ZIP Launchpad – San Diego, CA Nov 2023 – May 2024

- Designed and simulated virtual power devices to interface with energy equipment for seamless energy flow management.
- Led the development of a power device prototype, including research, documentation, PCB design, and code development.

Electrical & Transmission Head, Solar Electric Vehicle [Team Hyperion]-India Jul 2021 - Aug 2023

- Designed battery storage, motor controllers, and power circuits, reducing component failure rates by 20%.
- Developed buck-boost and AC-DC converters and power-efficient circuits for ECU, achieving 2nd place in SUVC and 4th in ESVC.
- Engineered a sensor network integrating ultrasonic, IR sensors, and RF circuits for an autonomous driving project.

Quality Assurance Intern, Electronet Equipments PVT LTD – India Jan 2022 - Feb 2022

- Optimized PCB layouts for ultrasonic level sensors and electromagnetic flow meters, achieving a 15% reduction in board size.
- Acted as a quality engineer, troubleshooting and resolving circuit-level issues in level sensors and electromagnetic flow meters.
- Conducted comprehensive testing and validation of SMPS units, enhancing efficiency, reliability, and performance, resulting in energy consumption improvement.

Projects

Analog Temperature Sensor Design & Validation Jan 2025 – May 2025

- Designed and validated a diode-connected NMOS CTAT sensor in 7nm ASAP7, optimizing sizing for power and linearity across -40°C to 125°C .
- Ran 100+ Monte Carlo HSPICE simulations to study W/L mismatch effects on VOUT and IDDQ.
- Performed 0–10 year Vth aging analysis using physics-based models, extracting year-wise VOUT and IDDQ shifts.
- Gained expertise in HSPICE, statistical variation, IC reliability, and automated validation skills directly applicable to hardware validation and semiconductor testing.

Reducing Power and Ground Voltage Noise Using Cadence PowerSI Oct 2024 – Dec 2024

- Optimized power/ground impedance on a 5-layer PCB using decoupling capacitors, reducing peak voltage fluctuations by 30%, improving power integrity for high-speed ICs.
- Conducted Z-parameter analysis to validate impedance and signal integrity improvements before and after optimization.

Wide-Bandgap Device Integration in DC-DC Converters Jan 2024 – May 2024

- Designed and simulated a DC-DC converter using Si, GaN, and SiC MOSFETs, demonstrating high efficiency and compact design potential.
- Developed PWM-based control logic and thermal modeling to ensure safe, reliable operation across variable load conditions.
- Conducted comparative analysis of wide-bandgap vs silicon devices, highlighting 10–15% improvement in efficiency and reduced thermal losses, suitable for high-performance EV powertrains.

Human Following Luggage Carrying Robot Jan 2023- May 2023

- Designed and integrated an autonomous robotic platform with BLE and ultrasonic sensing, motor actuation, and ESP32-based control for human-tracking and obstacle avoidance.
- Built the full system architecture (power management, communication interfaces, sensor fusion) for real-time coordination between hardware subsystems.
- Validated via full-system testing & optimization, resolving EMI, and reliability issues; published results in a journal paper (Link).