ASHAY UDAY BERDE

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ABOUT ME

Recent M.S. graduate in Electrical and Computer Engineering (May 2025) seeking full-time roles in hardware design, system validation, and embedded development. Experienced in PCB design, cross-domain integration, lab debugging, and communication protocols (UART, SPI, I2C). Strong foundation in circuit analysis, problem-solving, and effective technical communication.

EDUCATION

Purdue University | *GPA:3.39* — Indianapolis, IN
Master of Science in Electrical and Computer Engineering — May 2025
Courses: MOS VLSI Design, System on Chip, Computer Architecture, Connected & Automated Vehicles, RTOS

KJ Somaiya College of Engineering, — Mumbai, India
Bachelor of Technology in Electronics Engineering — May 2023

TECHNICAL SKILLS

Hardware Design: Schematic capture, multilayer PCB layout in Altium; DRC/LVS, BOM generation, signal and power integrity
Validation & Debugging: Oscilloscope, Logic Analyzer, Power Supply, Test Plan Development, Hardware Bring-Up
Embedded Systems: ESP32, LPC1768, Arduino; C/C++ firmware development, real-time debugging
Communication Protocols: UART, SPI, I2C, RS232, AXI (basic)
Simulation & EDA Tools: Cadence Virtuoso, Multisim, LTSpice, MATLAB
Programming & Scripting: C++, Python, Git Version Control

EXPERIENCE

Purdue University — Indianapolis, IN
Graduate Teaching Assistant – Engineering Projects in Community Service — Fall 2024 – May 2025
- Mentored undergraduate engineering teams to develop and validate embedded hardware solutions for community needs
- Led hardware integration, programming, and troubleshooting using lab tools for student-designed automation solutions
- Facilitated technical documentation, design reviews, and troubleshooting sessions across hardware and software teams

Ayka Control Systems Pvt. Ltd. — Mumbai, India
Hardware Design Intern — Oct 2022 – Jun 2023
- Contributed to the design of India's first 7.4kW UPI-based Level 2 EV chargers, compliant with EVSE standards
- Engineered and tested 2-layer PCBs for EV charging communication system using Altium Designer; performed schematic capture, layout, and rule checks for manufacturability
- Conducted bench-level validation using oscilloscopes and power supplies to test voltage regulation, power delivery, and thermal stability under varied load conditions
- Collaborated with firmware and hardware teams to troubleshoot integration issues and optimize signal integrity

TECHNICAL PROJECTS

8×8 Dadda Multiplier | Cadence Virtuoso, 45nm CMOS — Dec 2024
- Designed a high-speed 8×8 multiplier using a modified Dadda tree architecture and compact transmission-gate-based adders for low transistor count (1714T), targeting ALU applications
- Verified functional correctness through extensive vector-based testing and simulation in Cadence Virtuoso; achieved a maximum operating frequency of 1.25 GHz with a critical path delay of 2.4 ns
- Minimized dynamic power dissipation to 35 μW at 1.2 V under typical conditions, balancing speed, power, and area through optimized adder design and layout refinement

ESP32-Based Automation Control PCB for Industrial Applications — May 2023
- Designed a custom ESP32-based PCB for industrial automation, integrating I2C, SPI, and UART interfaces for peripheral communication
- Implemented relay control logic and multi-voltage power regulation (5V/12V/3.3V) with reverse voltage protection for enhanced field reliability
- Validated power distribution and signal integrity under varied load conditions using oscilloscope and bench instrumentation

2D Morphological Filter on PYNQ-Z2 SoC | VHDL, AXI, DMA, Python — Apr 2024
- Implemented dilation, erosion, opening, and closing filters in VHDL with AXI-Lite control and DMA-accelerated image transfer
- Integrated real-time software control using Python and validated hardware processing using test benches and visual output comparisons