Muhammad Zohaib Ali

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EDUCATION

Purdue University — May 2026
B.Sc. in Computer Engineering | Cumulative GPA: 3.85/4.00
Concentrations: Computer Systems, AI/ML, Semiconductor and Microelectronics

Relevant Coursework: ASIC Digital System Design, Microprocessor Systems and Interfacing, Data Structures and Algorithms (in C), Object-Oriented Programming in C++, **Computer Design and Prototyping, Operating Systems Engineering, Embedded Systems**
Awards and Affiliations: Dean's List and Semester Honors Tau Beta Pi Indiana Alpha, Eta Kappa Nu (HKN)

TECHNICAL EXPERIENCE

Johnson & Johnson MedTech — May 2024 – August 2024
R&D Electrical Design Intern — *Cincinnati, OH*
- Designed a 4-layer PCB with instrumentation amplifiers and filtering using Altium Designer to reduce noise and improve signal amplification by 40% for robotic arm motor drivers through failure analysis and system validation
- Developed modular firmware for I^2C-based button drivers on STM32 to reduce demo setup time by 20%, for easy integration in current and future design teams
- Led intern Technical Committee, training 50+ interns in Python, Arduino, and Patenting in addition to creating an electrical engineering employee training course for 80+ employees

MMH Labs - Rescue UAV — January 2024 – Current
Research Assistant — *West Lafayette, IN*
- Collaborated with PhD researchers to design a UAV system integrating advanced contactless sensors (PPG, LiDAR) using embedded C and BLE communication for remote human vital signs monitoring
- Achieved 80% accuracy for human body temperature measurement from a 45cm+ distance using an ESP32 microcontroller
- Co-authored findings to detailing sensor integration for contactless measurements to highlight advancements in embedded systems and sensor accuracy

PROJECT EXPERIENCE

Single Cycle Processor and Multicore Processor — January 2025 - Current
Computer Design Project — *West Lafayette, IN*
- Designed a single-cycle RISC-V processor in SystemVerilog, achieving a 15% reduction in execution cycles through pipeline optimization. Prototyped and validated on Altera DE2-115 FPGA
- Currently developing multi-core processor functionality, focusing on enhancing parallel processing, scalability, and performance optimization for real-time applications, ensuring seamless integration of hardware components

Vortex GPGPU Integration System — January 2025 - Current
Purdue SoCET (System on Chip Extension Technologies) GPU Accelerator team — *West Lafayette, IN*
- Designing RTL for divergence flow management between SIMT and scalar cores in GPU pipeline, optimizing execution efficiency for parallel workloads in AI/ML applications

Micro Aerial Vehicle Research Innovation Club (MAVERIC) — January 2025 - Current
Founder and President — *West Lafayette, IN*
- Developing a UAV & UGV system with radio telemetry for inter-vehicle & ground station communication
- Implementing FPV video streaming, integrating real-time embedded systems & RF communication
- Designing autonomous navigation & control systems for UAVs & UGVs, optimizing sensor fusion & wireless reliability.

USB 1.1 AHB-Lite SoC Module — November 2024
ASIC Group Design Project — *West Lafayette, IN*
- Implemented SystemVerilog to create AHB (Advanced high performance bus) module for USB 1.1
- Designed detailed RTL for operations such as communication with the Transreceiver and the Receiver
- Verified functionality through validation plan which involved individual and integrated testbenching and wave generation in Questasim to ensure USB functionality and 100% of RAW Hazard error test coverage

SKILLS

Hardware: PCB Design, ASIC Design and Verification, RTL Design and Verification, Altium Designer, FPGA, Oscilloscopes, GPU, CPU, KiCAD, Autodesk Eagle, x86, RISC-V Assembly, RISC-V, ARM, FPGA prototyping
Software: C, C++, Embedded C, Linux, Python, SystemVerilog, Verilog, Arduino, MATLAB, Git, STM32, AutoCAD, CUDA, LTspice, JIRA, I^2C, SPI, USART, PWM, UVM, Linux Kernel, Synopsys Custom Compiler