



# Muhammad Sohaib Sarwar

Electrical Engineer • Embedded/FPGA Systems & IoT,  
IC Design, Motor Drives, PCB Design

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I am a Results-driven hardware systems engineer and technical team leader passionate about core problem-solving and delivering market-ready solutions. Specializing in leveraging robust Embedded/FPGA & IoT architectures and bare-metal programming to architect and control complex electromechanical systems. Proven ability to navigate strict physical constraints to transition designs from simulation to physical deployment, culminating in multiple national-level robotics wins.

## EDUCATION

### B.Sc. Electrical Engineering

Namal University, Mianwali

09/2022 – 07/2026 | GPA: 3.46 / 4.0

#### Key Courses

- Computer Architecture & RISC-V
- Embedded Systems & IoT
- Power Electronics
- Digital Signal Processing
- Control Systems
- Electric Machines
- Introduction to Machine Learning

## WORK EXPERIENCE

### IC Design Intern

GSME & GF-METRC, FAST-NUCES

06/2025 – 08/2025 | Islamabad

- Executed complete **Analog (TSMC 130nm)** and **Digital (TSMC 65nm)** IC design flows using Cadence tools.
- Designed CMOS amplifiers and managed full RTL-to-GDSII ASIC implementation, successfully navigating DRC, LVS, and timing closure.

### Research Assistant

Center of AI & Big Data (CAID), Namal

06/2024 – Present | Mianwali

- Re-engineered **"FootAnalyzer,"** a medical-grade diagnostic device, by migrating from two Arduino-Megas to a low-cost RISC-V MCU (CH32V003) for data-acquisition & seamless cloud data transmission.
- Designed and delivered EMI-optimized, high-speed custom PCBs for mass manufacturing and developed FPGA-based UART module on Tang Nano 9k.

## ORGANIZATIONS

Namal Society for Social Impact (2024–2025)

Graphics Head

Namal Skills Development Society (2023–2024)

Graphics Designer

## INTERESTS

- Electronics Tinkering
- Open-Source Embedded Hardware
- Robotics & Electromechanical Systems
- Video Gaming
- Travelling

## SKILLS

- Embedded C
- Arduino/RaspberryPI
- ESP32/STM32/CH32
- Hi-Speed PCB Design
- MicroPython
- RTL/FPGA/ RISC-V
- C/C++ OOP
- PID/FOC/SMC Control
- Electromagnetic Motor Design & FEA
- Switching-Mode Power Supply Design
- Python/DSP
- Systems Engineering
- Project Management
- Instrumentation

## SELECTED PROJECTS

### FYP: Design of Yokeless Axial Flux Motor (YAFM) & its Control using RISC-V Processor

- Designed an industry-validated, 1cm thick, 0.8kg YAFM in Ansys MotorCAD and implemented a bare-metal Field-Oriented Control (FOC) algorithm on a CH32V307 RISC-V MCU, achieving full speed in just 0.8s and precise servo stabilization in 0.3s.

### RV32I Pipelined Processor (VHDL) — GCC-Compatible SoC

- Developed a GCC-compatible, 5-stage pipelined processor in VHDL featuring hazard detection and a Wishbone bus interconnect.

### CanSAT: Satellite Prototype(ESP32 + MATLAB + Python)

- Engineered an Award Winning Wireless Communication based prototype featuring IMU sensor fusion, real-time MATLAB 3D telemetry visualization, and Python-based data-driven trajectory prediction.

### Single-Phase Bidirectional Battery Charger (PLECS)

- Modeled a single-phase charger utilizing PID-controlled Buck/Boost and H-Bridge rectifier/Inverter, integrated with PLL-based frequency synchronization for Grid-Tied applications.

### Robotics Projects (Sumowar & Line Following Robot)

- Led engineering teams to multiple national-level victories by designing custom mechanical chassis and programming PID Motor Control algorithms in C and MicroPython for Sumo and Line-Following robots.

## CERTIFICATES

Hi-Speed PCB Design — Fedevel Academy (Philip Salmony & Rick Hartley)

Crash Course Electronics & PCB Design — Udemy (André LaMothe)

## ACHIEVEMENTS

Dedication Award — CanSAT Competition 2025

SUPARCO × RESOLVE, UET Lahore

Winner — Sumo-War Robotics, AI InnoFest 2025

CoE-AI, Bahria University

Winner & Runner-Up — Balloon-Bursting Robotics, Robonam 2.0

Namal Tech Expo 2025

Foot Analyzer — Shortlisted at Business Plan Competition 2026

AFS Venture Spark, MNSUAM

Automated Pest Control System—Shortlisted at Business Plan Competition 2023

AFS Venture Spark, MNSUAM

Merit based Fully-Funded Scholarship — Competitive Entry-Test Based

Namal University, Mianwali