

MAMAN ALI

Electrical Engineer



Profile Summary

I am an Electrical Engineer with a CGPA of 3.5 and a passion for research and development in embedded systems, RF antenna design, and mechanical systems. I've worked on projects like Student Satellite systems and antenna design and manufacturing. I'm committed to delivering innovative, high-quality solutions in every project.

Skills

Software:

- ANSYS HFSS
- ADS and Cadence AWR
- Solid works
- Fusion 360
- Arduino IDE
- IDF Espressif
- Satellite toolkit STK
- MATLAB
- Open Rocket
- C++, Python
- HTML, CSS
- MS Office
- Overleaf Latex

Hardware:

- Vector network analyzer (VNA)
- SDR ++ (ADALM Pluto)

Machines:

- 3D Printer (Creality K1C)

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Education Details

- **BSc Electrical Engineering**
University of Central Punjab
Lahore
Aug 2020 – Oct 2024
- **FSc Pre Engineering**
Punjab Group of Colleges
Lahore
May 2018 – May 2020

Work Experience

- **Research Assistant at Space Research Center - UCP**
Feb 2024 — Present
Working on the following projects:
 - Student Satellite CANSAT and CUBESAT
 - FMCW Radar
 - UWB Phased Antenna Array
 - Ground Station AntennasLink: <https://sites.google.com/view/space4all/home>

Projects:

• Educational Satellites: CanSat & CubeSat Development

Designed and developed CanSat and CubeSat prototypes for telemetry, imaging, and wireless data transmission. Integrated ESP32 microcontrollers with sensors (BMP180, MPU6050, HMC5883L) for real-time telemetry. Used NRF24L01 and ESP32-to-ESP32 communication with Yagi antennas for range extension. Successfully demonstrated data downlink and image transmission for satellite education missions.

• FMCW Radar System Simulation (ADS & AWR)

Designed and analyzed an FMCW radar at 1GHz with substrate fr4 and thickness of 1.6mm and copper clad 35 um using Keysight ADS and Cadence AWR.

• Antenna Design at 2.4 GHz (Dipole, Turnstile, Patch, Horn, and Cross Dipole)

Designed and simulated multiple antenna types including dipole, turnstile, patch, horn, and cross dipole at 2.4 GHz, optimizing for gain, bandwidth, and radiation pattern for wireless communication applications.

• Vivaldi Antenna Array Development (Antipodal + Dividers)

Designed and simulated wideband Vivaldi and antipodal arrays for UWB applications. Created 1x2, 1x4, array networks with Wilkinson power dividers. Achieved bandwidth extension (1–10 GHz) with corrugated antipodal Vivaldi designs. Optimized impedance matching for wideband operation in HFSS.

• Ground Station Development for Satellites

Built and tested ground station antenna systems for satellite reception. Designed and deployed cross dipole, V-dipole, and QFH antennas. Successfully received real-time NOAA satellite weather images.

• Arduino-Based Line Follower Robot

Designed and programmed an autonomous line follower robot using IR sensors and Arduino to detect and follow a predefined path with real-time speed and direction control.

• Greenhouse Monitoring and Control using STM32 (Bare-Metal Programming)

Developed an automated greenhouse system using STM32 microcontroller with bare-metal programming to monitor temperature, humidity, and soil moisture, and control actuators for optimal growing conditions.

Language:

- Urdu (native)
- English

- **Arduino-Based DC Motor Speed Control and RPM Measurement**

Designed a feedback control system using Arduino and a Hall effect sensor to control and monitor DC motor speed, enabling real-time RPM calculation and precise speed regulation.

- **Machine Learning–Based Fraud Detection Model**

Developed a supervised learning model to detect fraudulent transactions using data preprocessing, feature engineering, and classification algorithms to improve accuracy and reduce false positives.

- **Design of RF and Microwave Components**

Designed and simulated key RF/microwave components including micro strip and waveguide-based Low Pass Filter , Band Pass Filter, Band Stop Filter, and Wilkinson power divider, focusing on performance optimization in terms of S-parameters, insertion loss, and return loss.

- **Antenna Design and Development for NOAA Satellite Data Reception**

Designed and developed V-dipole, cross dipole, and QFH (Quadrifilar Helix) antennas for receiving real-time weather data from National Oceanic and Atmospheric Administration (NOAA) satellites, optimized for 137 MHz frequency band and improved signal reception quality.

ACHIEVEMENTS

- **Runner Up at National CANSAT Competition by IST** April 2024

Secured 2nd place in a CanSat competition, demonstrating strong satellite system design and testing capabilities.

- **NGIRI–Ignite Grant for CANSAT Student Satellite Project** July 2024

Received funding under National Grassroots ICT Research Initiative (**NGIRI**), Project ID: NGIRI-2024-27708, by Ignite – National Technology Fund, Ministry of Information Technology and Telecommunication, Pakistan. PKR 0.093 Million for final year project on CANSAT design and development.

- **Awarded for Student Satellite Development Project** April 2025

Participated in Pintech Expo 2025 held at Expo Center Lahore and received winner prize for innovative work on student satellite development.

- **Designed a modular CanSat training kit for student learning and STEM outreach** Aug 2025

Designed a modular CanSat training kit for student learning and STEM outreach.

- **STEM Outreach & Training (in collaboration with SUPARCO)** Sep 2025

Delivered hands-on CanSat training sessions in 5 universities in Lahore, mentoring student on satellite design, integration, and testing.

Research Publication:

- B. Ahmad, D. Babar, W. Afzaal, M. M. Chishti, M. Ali, Z. Ahmad, and M. K. Saleem, “Design and Development of a Hybrid NOAA Ground Station,” Department of Electrical Engineering, University of Central Punjab, Lahore, Pakistan. Submitted to HITE 2025