

Minahil Ahsan

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PROFESSIONAL SUMMARY

An undergraduate electrical engineering student at the National University of Sciences and Technology (NUST) with practical experience in embedded systems, electronics, software development, and machine learning. Skilled in building Arduino-based prototypes, sensor-driven systems, C++ applications, and Python workflows. Strongly interested in robotics, autonomous systems, machine learning and computer vision.

SKILLS

- **Programming:** C++, Python, Object-Oriented Programming, Data Structures, File Handling, Algorithmic Logic, Debugging.
- **Web Development:** Website development, responsive UI design, web applications.
- **Embedded Systems:** Arduino UNO, ESP-12, Bluetooth modules, motor drivers, sensors, LDR, laser sensing, Hall-effect sensors.
- **Machine Learning:** Supervised learning, classification, data preprocessing, feature extraction, model evaluation, NLP fundamentals.
- **Electronics & Simulation:** LTspice, analog circuit design, signal conditioning, waveform analysis, filtering, circuit simulation.
- **Design Tools:** Figma, Canva, digital design.
- **Research Interests:** Robotics, autonomous systems, drone technology, embedded systems, and computer vision.
- **Professional Skills:** Technical writing, client communication, project management, teamwork, problem solving.

WORK EXPERIENCE

Arch Technologies | *Machine Learning Intern, Remote*

Feb 2026–Mar 2026

- Completed hands-on training in core machine-learning concepts, including classification, feature extraction, and data preprocessing.
- Practiced building structured AI workflows and strengthened understanding of how machine-learning and computer vision techniques are applied in robotics.

Fiverr and Upwork | *Freelance Web, Design, and Content Support, Remote*

2023–Present

- Deliver client-ready websites, web applications, graphic design assets, and content support with focus on usability, visual clarity, and functional requirements.
- Manage client communication, project requirements, revisions, timelines, and final delivery across multiple digital service areas.

EDUCATION

National University of Sciences and Technology (NUST), College of E&ME

Expected 2029

Bachelor of Electrical Engineering

Islamabad, Pakistan

- Current undergraduate student developing a strong foundation in electrical engineering, programming, electronics, embedded systems, applied engineering design, autonomous systems, and machine learning.

KIPS College

FSc / Intermediate, Pre-Engineering

Islamabad, Pakistan

Fauji Foundation College for Girls

Matriculation, Science

Islamabad, Pakistan

Smart EV Charging Network | *C++, Object-Oriented Programming, System Simulation*

- Designed and developed a city-scale intelligent EV charging ecosystem using object-oriented programming principles and modular software architecture.
- Implemented compatibility-based charging dock allocation, priority-aware scheduling, load optimization, deferred booking logic, and renewable-energy source selection under operational constraints.
- Developed an analytics engine for monitoring utilization trends, energy-source usage, charging demand patterns, revenue generation, and estimated carbon-emission savings.
- Applied advanced OOP concepts including encapsulation, inheritance, polymorphism, and scalable system design to model realistic charging infrastructure operations.

Email Spam Classifier | *Machine Learning, NLP*

- Developed a supervised machine-learning pipeline for automated spam email detection using text preprocessing, feature extraction, and classification techniques.
- Applied natural language processing concepts to transform unstructured text into machine-readable representations for predictive analysis.
- Evaluated classification performance and optimized preprocessing workflows to improve model reliability and generalization.

Persistence of Vision (POV) Display | *ESP-12, Embedded Systems*

- Contributed to the development of a rotating Persistence of Vision display utilizing ESP-12 microcontroller control and Hall-effect sensor synchronization.
- Implemented high-speed timing coordination to generate stable 360-degree visual patterns through rotational LED persistence effects.
- Secured 3rd Position (2nd Runner-Up) among 26 competing teams at Voltfest.

Smart Parking Management System | *C++, Data Structures*

- Developed a parking management simulation supporting vehicle registration, intelligent slot allocation, real-time monitoring, fee computation, and transaction history management.
- Implemented dynamic memory allocation, validation mechanisms, VIP-priority handling, parking-zone management, and automated revenue reporting.
- Designed algorithms for slot compatibility matching, duration tracking, overnight parking calculations, and billing automation.

Thermal Safety Controller Using Operational Amplifiers | *Analog Electronics, LTspice, Circuit Design*

- Designed and implemented an analog thermal safety controller using LM741 operational amplifiers and an LM358 comparator to generate control signals based on multiple voltage inputs.
- Developed and validated signal-processing stages for analog computation, comparator-based decision making, and LED status indication using LTspice simulation and breadboard implementation.
- Verified circuit performance through experimental testing and comparison of simulated and measured results, demonstrating reliable analog control-system operation.

Smart Energy Billing and Consumption Prediction System | *Python, Data Analytics*

- Developed an energy management platform supporting user authentication, appliance tracking, energy-consumption monitoring, billing automation, and reporting.
- Implemented peak and off-peak tariff calculations, overload detection, CSV-based data persistence, and consumption analytics.
- Integrated a linear-regression-based prediction model to estimate future energy-consumption trends.

Bluetooth-Controlled Arduino Car | *Arduino, Embedded Systems*

- Designed and developed a Bluetooth-controlled robotic vehicle using Arduino Uno, L298N motor driver, and wireless communication modules.
- Implemented PWM-based motor control, real-time directional navigation, and hardware-software integration for reliable operation.
- Conducted iterative testing and troubleshooting to improve motion responsiveness and system performance.

Laser Security and Detection System (LSADS) | *Arduino, Embedded Electronics*

- Developed a laser-based intrusion detection system utilizing Arduino Uno, LDR sensing, optical beam interruption, and real-time alarm activation.
- Implemented threshold-based detection logic to trigger visual and audible alerts upon unauthorized beam interruption.
- Integrated embedded electronics with mechanical fabrication processes including woodworking, welding, fitting, and casting techniques.

ACHIEVEMENTS & CERTIFICATIONS

Voltfest Competition, CEME, NUST	2026
• Secured 3rd Position (2nd Runner-Up) for an embedded systems and IoT-based Persistence of Vision (POV) Display project.	
Google Ads for Beginners <i>Coursera</i>	2026
Graphic Design Workshop (Figma & Canva) <i>CMC, BRISC & BURAQ</i>	2025
Programming for Everybody (Getting Started with Python) <i>Coursera</i>	2023