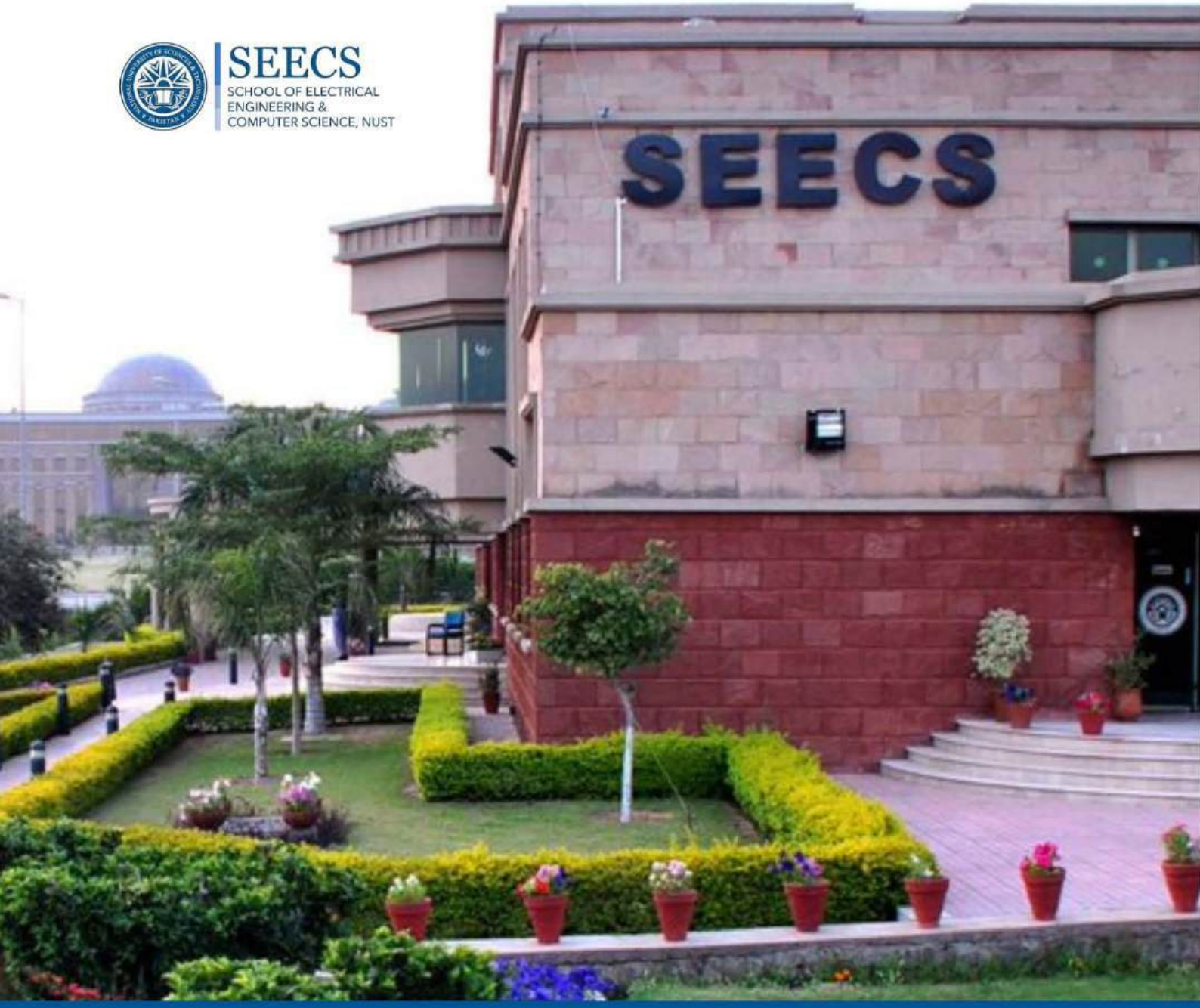
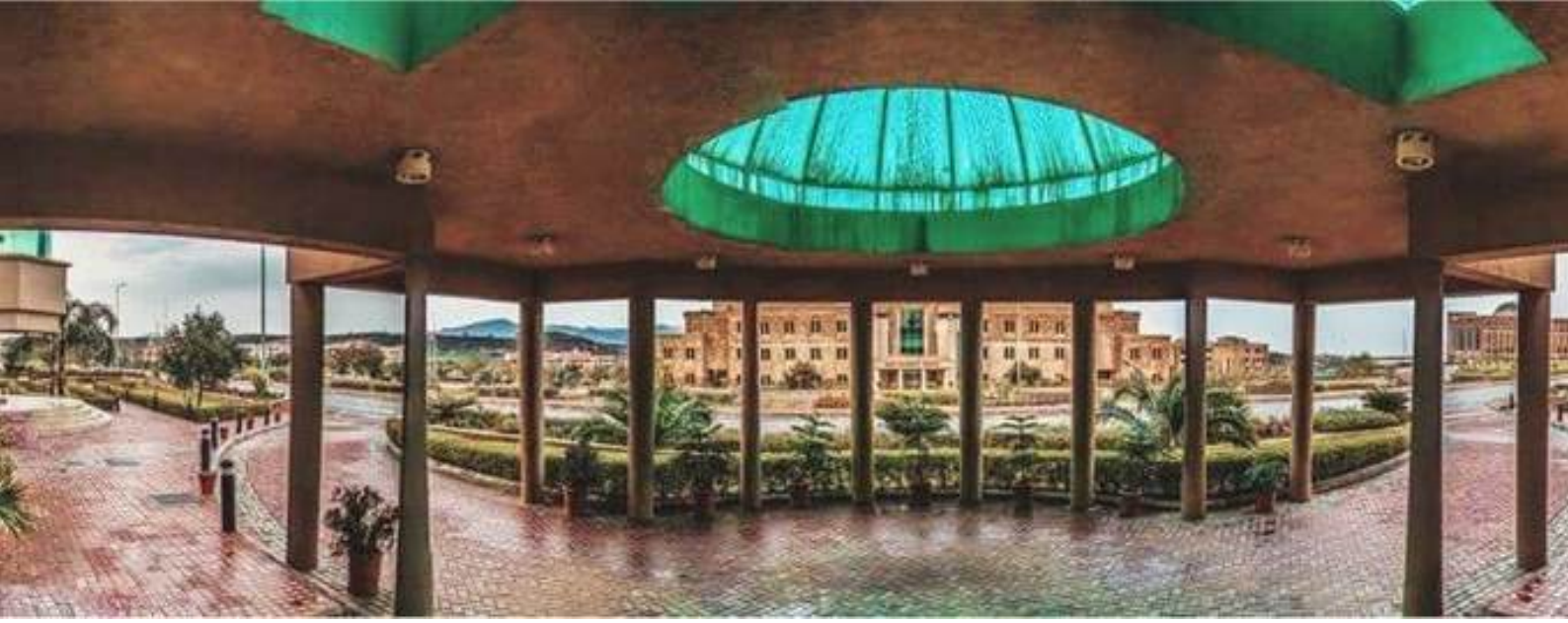
SEECS
SCHOOL OF ELECTRICAL ENGINEERING & COMPUTER SCIENCE, NUST



SEECS
GRADUATE BOOKLET
BEE-BACHELOR OF ELECTRICAL ENGINEERING
CLASS OF 2026



INTRODUCTION TO SEECS

NUST-SEECS stands as a center of excellence, dedicated to advancing research andinnovation in the fields of computing and electrical engineering. Our institution fosters a dynamic learning environment where students are encouraged to bridge the gap between academic theory and practical industry application. We take immense pride in our faculty and students, whose unwavering commitment ensures a spirit of distinction in every project and endeavor. By integrating professional ethics with technical mastery, we prepare our graduates to lead with integrity in the global technological landscape.

SEECS programs are globally recognized in the QS World University Rankings by Subject - **Computer Science ranks 114th globally, making it the #1 Computer Science program in Pakistan**, while **Electrical Engineering ranks 131st** and **Software Engineering ranks 132nd worldwide. Computer Science** also holds the distinction of being the **top merit program across all NUST programs,** reflecting the exceptional caliber of students it attracts.

The school remains at the forefront of national progress, cultivating the next generation of strategic thinkers and visionary engineers. Our graduates are equipped with a unique blend of technical expertise and leadership skills, making them highly sought after in the professional sector. By fostering a culture of continuous improvement and self-empowerment, SEECS continues to define the standard for engineering education in the region.

Greeting & Message from

Principal NUST-SEECS

Dr. Muhammad Ajmal Khan, SI(M)

PhD (Michigan State University, USA)

It is a pleasure to introduce to you the graduating classes of 2026 in the disciplines of Electrical Engineering, Software Engineering, and Computer Science. NUST-School of Electrical Engineering and Computer Science (SEECS) is committed to providing first-rate higher education in Pakistan. We emphasize making SEECS a center of excellence for imparting high-quality education in the areas of Electrical Engineering and Computer Science that would lead to the promotion of research and scholarly achievements at National & International levels. We foster a passion for creativity and productivity in our students through an enabling environment of state-of-the-art labs, arranging industry visits, seminars, and international conferences, etc. Besides imparting thorough professional knowledge, we also believe in instilling sound entrepreneurial, social and humanitarian values. The programs offered at SEECS include Electronics, Digital Systems, RF and Microwave, Telecommunication and Networks, Artificial Intelligence, Machine Learning, Big Data, Cyber Security, and Cloud Computing. Hands-on training in these domains augments the basic knowledge of our students, giving insights into its practical application, an essential prerequisite for potential technical leaders of the 21st century. The projects showcased in the Open House demonstrate the skill set of our graduating students, and the highly interactive sessions with the industrial professionals provide them a platform for networking. Another aim of holding this event is to address the dire need for industry-academia partnerships in Pakistan. Through Open House, the industry can witness the outstanding research of various disciplines that are being offered at NUST-SEECS. At the same time, the industry feedback helps us update our curriculum according to the contemporary market trends. Henceforth, I take immense delight in presenting the batch of 2026 as the proud product of SEECS and wish them success as they go forward in their respective fields, with all the best for their journey ahead.

OVERVIEW OF

OPEN HOUSE

NUST SEECS organizes its annual open house to showcase the skills of its graduating students. The idea is to provide a platform where our students and industry representatives can mingle and have informal or formal discussions. The students showcase their final year projects which represent their skill set and enable potential employers to identify any matching requirements. The projects are presented by students from:

Department of Electrical and Computer Engineering (ECE)

The Department of Electrical and Computer Engineering has divided its projects into five knowledge areas: Power Electronics and Control, Digital Systems and Signal Processing, Integrated Circuits and Systems, RF & Microwave, and Smart Telecommunications and Systems. There are a total of **70 projects presented by 168 students**, divided into the above mentioned knowledge groups. Most of the projects are aimed at providing technology-based solutions for social problems.

At NUST SEECS, we take pride in molding our bright entrants into well trained and appropriately groomed professionals in Computer Science, Software Engineering & Electrical Engineering. Our graduates are actively sought by the industry and our Alumni are occupying promising positions in some of the most prestigious industrial and business houses, both in public and private sectors. We hope you enjoy the hard work of our students and find the right candidate or the next big idea for your company.

Muhammad Saad Kashif

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Address: D-57,HOUSING COLONY,D.G CEMENT COMPANY LTD. , Dera ghazi khan , Pakistan

PROFESSIONAL PROFILE

Electrical Engineering graduate with hands-on experience across industrial automation, power systems, and advanced networking technologies. Proven exposure to PLCs, VFDs, transformer manufacturing, and tender documentation, complemented by strong skills in Linux-based development, Deep Packet Inspection (DPI), SDN, and AI-driven security systems. Experienced in real-world industrial and research projects, including edge-based DPI on Raspberry Pi and AI-powered KYC systems. Adept at bridging hardware and software domains, with strong analytical, communication, and problem-solving skills. Seeking to contribute to technology-driven engineering and networking environments.

EDUCATION

Bachelors of Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 2.55 (2026)

INTERNSHIP EXPERIENCE

D.G Cement Company Ltd, Dera Ghazi Khan.

09-Jun-2023 - 23-Jul-2023

Worked at Air-Cooled Condensed Project (Installed at WHR). • PLC Programming and Distributed Control System (DCS) Panels. • Variable Frequency Drives (VFDs) and Motors. • Process of Coal-Fired Power Plant (CFPP). • Field Instruments.

Creative GroupofCompanies,Township,Lahore.

24-Jun-2024 - 24-Aug-2024

Worked at Transformer Manufacturing Section & at sales & marketing department. • Transformer manufacturing. • Core and Windings. • Working on Tender requests and kept records of tenders. • Compiling biding documents for Tenders.

xFlow Research,I-9/3,Islamabad.

01-Jul-2025 - 25-Jan-2026

• Researched on a variety of commercial AI tools and learned to use them on industrial projects. • Developed an AI automated 2-step KYC self-verification module with facial verification, deepfake and liveness detection, OFAC and UN sanction filtering. • Researched on various international messaging and calling tools, and learned to use tools like Twilio. • Learned about and implemented secure gateways, application stress testing, API development, etc. • Overall learned a variety of industrial-significant skills and gained hands-on experience on real-life industrial company projects.

FINAL YEAR PROJECT

Edge DPI on Raspberry Pi for Real-Time Anomaly Detection in SDN-Enabled IWSNs

This final year project (FYP) focuses on developing a AI-driven Deep Packet Inspection (DPI) system for real-time anomaly detection in Industrial Wireless Sensor Networks (IWSNs) integrated with Software-Defined Networking (SDN). IWSNs are critical for industrial automation but vulnerable to cyber threats and failures. The project incorporates federated learning, utilizing Raspberry Pi devices as nodes, where each node hosts a local AI model and DPDK-accelerated DPI engine, connected to a centralized server for global model aggregation. This enhances detection of known and unknown anomalies while optimizing resource use in constrained environments. The system integrates with SDN for dynamic policy enforcement, improving resilience, adaptability, and threat mitigation in industrial settings.

TECHNICAL EXPERTISE

Programming Languages

•C/C++.•Python.•LadderLogicfor PLCs.

Computer Softwares

• AutoCAD,MATLAB&Simulink. • Proteus, OrCAD PSPICE & Atmel Studio • Wireshark & VirtualBox. • Cisco Packet Tracer & nDPI • DPDK & ONOS • Postman & pgadmin4 • RasberryPi OS & Linux

Professional Skills

•Tenders,Tender Requests, & Bidding Documents. • Mastery of Microsoft O**ffi**ce (Word, Excel, PowerPoint) & Google Suite (Docs, Sheets, Slides). • Ability of Qualitative & Quantitative Research. • Excellent communication skills with a focus on team building. • Outstanding organizational, multitasking, ...

Shameer Ashraf

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate at NUST with a strong focus on Artificial Intelligence, Computer Vision, and Robotics. Experienced in developing real-world AI systems, high-performance computing, and autonomous perception pipelines. Seeking opportunities to apply machine learning and embedded intelligence to impactful engineering and research problems.

EDUCATION

Bachelors in Electrical Engineering

School of Electrical Engineering & Computer Science , Islamabad , 3.86 (2026)

INTERNSHIP EXPERIENCE

ITSOLERA

24-Aug-2024 - 24-Oct-2026

Worked on real-world computer vision applications Developed an end-to-end pipeline for 3D reconstruction of ancient artifacts

Deep LearningLab,NUST

24-Jul-2024 - 24-Aug-2026

Implemented neural networks and convolution operations using CUDA. Led and supervised fellow interns. Studied transformer-based hand-pose estimation methods.

Computer VisionLab,SEECS,NUST

23-Jul-2026 - 23-Sep-2026

Learned Python, Machine Learning, and Deep Learning fundamentals. Developed a pipeline for point-to-polygon data conversion.

FINAL YEAR PROJECT

Autonomous Vision-Based UAV System

This project focuses on developing an Autonomous Catching UAV designed to identify, follow, and safely capture unauthorized aerial objects in real time. The system operates fully onboard using edge computing on an NVIDIA Jetson, enabling vision-based detection, tracking, and decision-making without reliance on ground control stations. A Pixhawk Cube Orange flight controller ensures reliable navigation, precise control, and stable autonomous flight, while a depth camera provides accurate 3D perception for close-range localization and maneuvering. The result is a smart aerial platform capable of autonomous situational awareness and coordinated interaction in complex airspaces.

TECHNICAL EXPERTISE

Programming Languages:

Python, C, C++, MATLAB, CUDA

Knowledge Domains:

Computer Vision, Machine Learning, Robotics, Reinforcement Learning

Tools & Frameworks:

Jetson, Pixhawk, Quartus, Proteus, LabVIEW, AutoCAD, QGIS

Sarah Yasrab

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at NUST with hands-on experience in Digital IC Design, RISC-V processor architecture, and embedded systems. Seeking an entry-level role or graduate position where I can contribute to processor design, RTL development, and hardware verification while continuously learning and building scalable, real-world hardware solutions.

EDUCATION

EE

Seecs , islamabad

INTERNSHIP EXPERIENCE

Nust ChipDesignCentre

18-Mar-2025 - 30-Aug-2025

I completed training in digital ic design during my internship, It included c language module, dld module, riscv and computer architecture module and completed a riscv pipelined processor with data and control hazards reduced by stalls and forwarding in vivado.

Mine labrimmsNust

03-Jun-2024 - 29-Aug-2024

I learned multi layer pcb designing in altium. I gain a handson experience by completing di**ff**erent analog and digital circuits by simulating them and aking their pcb as final projects i made 16bit sequence detector and made pcb of arduino nano board

FINAL YEAR PROJECT

Design and Verification of Risc-V Vector Processor IP

Design and Verification of a RISC-V Vector Processor IP integrated with a scalar core (Concordia-1) using the PCPI interface. Involves RTL development, performance-optimized vector execution, and verification using Google's RISC-V DV framework.

TECHNICAL EXPERTISE

pcb design

I have handson experience of designing pcb in altium and kicad

Proteus simulation

I have handson experience of making an 8 bit computer in proteus

Vivado

I have handson experience of desiging rtl in vivado and quartus

embedded systems

I have experience of writing c and assembly codes to run on arduino and stm 32f4

Graphic Designing

I work remotely with a company Scholarmed as their HR and marketing manager where I also make posts for instagram on Canva

Muqaddas Masood

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Address: , Pakistan

PROFESSIONAL PROFILE

I am a motivated electrical engineering student with a strong interest in FPGA development, IC design, research, and embedded systems. I aim to apply my skills in Verilog HDL, hardware and software co-design,and microcontroller-based system development
to contribute to innovative engineering solutions while expanding my research and hands-on design experience.

EDUCATION

BE Electrical Engineering

School of ELectrical Engineering and Computer science (NUST) , Islamabad , 3.53 (2026)

INTERNSHIP EXPERIENCE

NECOP

14-Jul-2025 - 14-Sep-2025

DMA Loopback Project Implemented and tested a DMA loopback design on FPGA, configuring AXI interfaces to validate high-speed data transfers. Gained hands-on experience in FPGA prototyping, simulation, and hardware debugging, while strengthening understanding of system-level design and verification.

Octaloop

01-Jul-2024 - 19-Aug-2024

Developed an AI-powered chatbot using Botpress, integrating API keys to enable smooth and dynamic user interactions.

Pakistan Railway

26-Aug-2024 - 07-Sep-2024

Railway Workshop: Participated in a two-week workshop focused on the electrical setup and power distribution in trains. Gained hands-on experience through industrial visits, learning about the intricate systems that power trains and their operations in real-world environments.

FINAL YEAR PROJECT

High-Speed AI Accelerator on FPGA for Real-Time Applications

This project focuses on implementing the YOLOv8-Nano object detection algorithm on an FPGA using High-Level Synthesis (HLS) to achieve real-time performance for edge applications. YOLOv8-Nano is a lightweight and e**ffi**cient deep learning model designed for fast object detection with reduced computational complexity. The project involves converting key neural network layers such as convolution, batch normalization, activation, and feature map processing into hardware-accelerated modules using HLS, while the control and system integration are handled through an embedded processor. The design emphasizes parallel processing, pipelining, and e**ffi**cient memory management to optimize latency, throughput, and FPGA resource utilization. The final system will be capable of performing real-time object detection for applications such as surveillance, autonomous systems, and smart embedded devices, while also serving as a research platform for future ASIC and AI accelerator development.

TECHNICAL EXPERTISE

FPGA Design

Vivado, Verilog HDL, synthesis, implementation, timing analysis HLS Development C/C++ to RTL using Vivado HLS, pipelining, optimization,ARM FPGA integration, AXI, IP-based systems.

Muhammad Haris

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PROFESSIONAL PROFILE

High-achieving Final Year **Electrical Engineering** student at **NUST** with specialized expertise in **FPGA-based RTL Design**, **Embedded Systems**, and **AI Acceleration**. Proven track record in designing **RISC-V Processors** using **SystemVerilog** and optimizing **Deep Learning** models for hardware integration. Previously served at **XCRL Pakistan (Xcelerium)**, where I gained hands-on experience in **Chip Design** and **Embedded systems**, aiming to deliver high-performance solutions at the intersection of hardware and intelligent systems.

EDUCATION

Bachelor of Electrical Engineering

SEECS , Islambad , 3.56/4.00 ((2022 – 2026))

INTERNSHIP EXPERIENCE

XCRL (Xcelerium),Pakistan

07-Nov-2025 - 15-Jan-2026

Engaged in an architectural exploration of many-core research platforms, specifically focusing on the OpenPiton framework and its integration with CVA6 (RISC-V) application-class cores. The role centered on analyzing the complexities of the CVA6 6-stage pipeline and understanding its interaction within the OpenPiton ecosystem, particularly regarding Network-on-Chip (NoC) infrastructures and cache coherence protocols. By exploring these open-source hardware platforms, I gained deep insights into scalable tile-based architectures and the hardware-software stack required for high-performance research environments, providing a foundational understanding of industrial-grade RISC-V implementation and many-core system design

NUST Chip Design Centre (NCDC)

12-Feb-2025 - 31-Aug-2025

Worked on FPGA-based digital chip design projects involving RTL design, simulation, and hardware implementation in System Verilog, gaining hands-on experience with C programming, Linux, Digital System Design, RISC-V and computer architecture, and processor design. Implemented a 5 Stage Pipelined Single-Cycle RISC-V Processor using System-Verilog on FPGA. Project includes complete datapath and control logic with instruction memory, data memory, ALU, immediate generator, and branch comparator. It supports the complete RV32I instruction set (R, I, S, B, U, J types) and optimized for hardware-software co-design learning. Designed and implemented an FPGA-based smart anti-theft car security system in Verilog HDL on the DE1-SoC, featuring a reprogrammable FSM, sensor debouncing, siren generation, and a fuel-pump safety interlock to prevent unauthorized access.

Deep LearningLab(SINES)

01-Jun-2024 - 01-Sep-2024

Implemented machine learning and deep learning models for image processing and computer vision applications. Trained and evaluated convolutional neural networks using PyTorch and TensorFlow with GPU acceleration through CUDA. Validated model performance using standard metrics and gained experience in end to end model development and experimentation.

FINAL YEAR PROJECT

ML based Hardware Accelerator for Real Time Image Segmentation on FPGA

Designing an FPGA based hardware accelerator for real time image segmentation using an encoder decoder architecture. The project focuses on deploying a lightweight U-Net model optimized for hardware implementation to achieve low latency and high throughput. Parallel processing and on chip memory optimization techniques are used to e**ffi**ciently map convolution, pooling, and upsampling operations on FPGA fabric. The system is evaluated by benchmarking performance against CPU and GPU

implementations in terms of speed, accuracy, and energy efficiency, with target applications in autonomous driving and medical imaging.

TECHNICAL EXPERTISE

RTL and FPGA Design

RTL Design, Verilog, SystemVerilog, FPGA Architecture, RISC V Processor Design, Computer Architecture, Digital System Design, Hardware Verification, Artix A7, Zybo Z7-20, DE1 SoC, AXI Interface.

Embedded Systems

Embedded C, FreeRTOS, I2C, UART, SPI, Embedded Linux, Bootloaders, Linux Kernel Configuration, GPIO and Peripheral Interfacing, STM32, ESP32, Arduino, ATmega Microcontrollers, Jetson Orin Nano.

Deep Learning

TensorFlow, Keras, PyTorch, Scikit-learn, NumPy & Pandas, Matplotlib, ANNs, CNNs, RNNs & LSTMs, Generative Models, GANs, Autoencoders, Transformers & LLMs.

Computer Vision

OpenCV, Image Processing, Filtering, Edge & Feature Detection (Canny, Harris, SIFT, SURF), Camera Models, Calibration, Stereo, Homography, Perspective Transformations, Object Detection (YOLO), Object Tracking (SORT), Kalman Filter, Image Segmentation (Clustering, U-Net), Optical Flow, Pose Estimation.

Abdullah Awais

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PROFESSIONAL PROFILE

Motivated **8th-semester Electrical Engineering student** with strong programming skills in **MATLAB, C/C++, object-oriented programming, and AVR development**. Experienced in **RTL design and digital logic development**, with a solid foundation in hardware-level system implementation. Proficient in **simulation development**, **digital system modeling**, and **schematic design**
using tools such as **Fritzing**. Passionate about developing e**ffi**cient hardware-centric solutions and eager to further deepen expertise in **embedded systems, IoT, RTL-based system design, and advanced digital engineering technologies**.

EDUCATION

Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 3.55 (2026)

INTERNSHIP EXPERIENCE

Nust ChipDesignCentre

10-Jun-2025 - 29-Aug-2025

Training Labs and Assignments in C/C++, Digital Logic Design (DLD), RISC-V Assembly, and Computer Architecture and worked on the project 'RTL to GDS-II design of AES Rijndael block cipher'.

FINAL YEAR PROJECT

ASIC design of AES Rijndael

The project involves designing an Application-Specific Integrated Circuit (ASIC) for the AES Rijndael cipher, a widely used encryption standard. The aim is to deliver a high performance GDS-II file of the AES block cipher and verify it using the Universal Verification Methodology (UVM)

TECHNICAL EXPERTISE

Programming

Strong programming proficiency in C/C++, Python, and MATLAB, with experience in algorithm implementation, numerical analysis, and engineering simulations.

Digital & RTL Design

Experienced in Verilog-based RTL design, digital circuit implementation, and functional verification through simulation and debugging.

Debugging & Problem Solving

Strong debugging skills with the ability to analyze hardware and software issues, trace root causes, and implement effective fixes.

Circuit Design & Analysis

Proficient in circuit designing and analysis, including component selection, schematic development, and performance evaluation.

Embedded & IoT Systems

Hands-on experience in IoT system development using ESP32, ESP8266, and Arduino, including sensor interfacing and communication protocols.

MATLAB & Simulink
SkilledinMATLABandSimulink for system modeling, simulation, signal processing, and control-oriented applications.

CAD & Modeling Tools
ExperiencedinAutoCADmodeling for technical drawings, layout design, and engineering documentation.

Mamona Sadaf

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at NUST seeking opportunities in telecommunications engineering, network optimization, or AI/ML-driven communications. Currently working on intelligent resource allocation in O-RAN architecture, with strong expertise in next-generation telecom technologies, software-defined networking, and machine learning applications for network intelligence.

Focused on contributing to 5G/6G RAN engineering, network automation, or telecom R&D roles where I can apply technical skills to advance intelligent, programmable communication systems.

EDUCATION

BS Electrical Engineering

SEECS , Islamabad (2026)

INTERNSHIP EXPERIENCE

DRONEXT

16-Jun-2025 - 16-Aug-2026

Worked as a Research Intern in the Department of Electrical Engineering at NUST, where I developed and optimized a wireless charging system for hybrid electric vehicles. Implemented advanced control techniques (SMC, ISMC, ISTSMC) and AI-based optimization algorithms in MATLAB/Simulink, improving charging e**ffi**ciency to approximately 97%. Conducted system modeling, simulations, and documented the results.

FINAL YEAR PROJECT

Intelligent Resource Allocation in O-RAN

The Open Radio Access Network (O-RAN) architecture introduces openness, programmability, and intelligence into the RAN ecosystem. By leveraging AI/ML techniques, O-RAN enables e**ffi**cient and adaptive resource allocation, improving spectrum utilization, user experience, and energy e**ffi**ciency. Key components of O-RAN include: • Near-Real-Time RIC (Near-RT RIC): Executes control decisions within ~10 ms to 1 s. • Non-Real-Time RIC (Non-RT RIC): Provides policy guidance, analytics, and AI/ML model training (time scales of seconds to hours). This project focuses on designing and implementing a framework for intelligent resource allocation in O-RAN, which may include use cases such as dynamic spectrum allocation, tra**ffi**c load balancing, QoS-aware scheduling, or energy-e**ffi**cient resource management. The solution will be tested and validated in a virtualized O-RAN environment using open-source platforms (e.g., OSC RIC, ONF SD-RAN, or OAI).

TECHNICAL EXPERTISE

Telecom & Networking Technologies

O-RAN, srsRAN, UERANSIM, free5GC, Open5GS, VPP (Vector Packet Processing), MPLS, Linux, Shell Scripting

ML & Computer Vision

Python, NumPy, Pandas, Scikit-learn, OpenCV, TensorFlow/Keras, PyTorch, ANNs, CNNs

Programming Languages

Python, C/C++/C#, MATLAB, Simulink

Tools and Technologies

Linux (Ubuntu), Git/GitHub, Wireshark, Jupyter Notebook, VS Code, Bash/Shell Scripting

Abdul Mohiz Naseer

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PROFESSIONAL PROFILE

Aspiring Electrical Engineer with a robust background in embedded systems and energy innovation. I pair technical proficiency in programming and machine learning with a strong work ethic and keen attention to detail, making me a versatile asset ready for entry- level engineering roles that require both practical skills and rapid adaptability.

EDUCATION

Electrical engineering

SEECS , islamabad , 2.2 (2026)

INTERNSHIP EXPERIENCE

DRONEXAS UAV & Robotics Lab, SEECS NUST

27-Apr-2026 - 27-Jul-2025

• Conducted simulation and modeling of a bidirectional EV charging system enabling energy flow between grid, solar sources, batteries, and electric vehicles. • Designed and analyzed Vehicle-to-Grid (V2G) and multi-source energy flow scenarios using MATLAB and Simulink. • Performed research-focused analysis to evaluate system behavior, e**ffi**ciency, and control strategies for bidirectional power flow.

FINAL YEAR PROJECT

Digital Twin of UAV

A virtual twin of a UAV taking all the resource intensive programming and testing o**ff** of an actual drone and doing it on Ground Station, and leading the actual drone, making hardware a follower. Skill Set: Robot Operating System (ROS) Python Prgramming C Programming PX4 Autopilot / Ardupilot Blender - Model Creation Gazebo - World Generation Raspberry Pi - Companion Computer

TECHNICAL EXPERTISE

Robotic Arm

Built a 4-DOF robotic arm controlled via microcontroller for precision movements.

Sigma-Delta Modulator (Communication Systems)

Simulated noise-shaping ADC/DAC for 64-QAM signal reconstruction

Robot Operating System

Proficient in working with ROS for fully automating and implementing a communication model in UAV using custom written scripts.

Embedded Programming

Proficient in optimizing hardware usage using C programming for Microcontrollers. Work experience in using STM32 and ATMega Devices.Proficient in Arduino,ESP Programming.

Irfa Farooq

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PROFESSIONAL PROFILE

I am an Electrical Engineering undergraduate with a strong inclination toward digital design and low-level system development, particularly in the area of processor and accelerator architectures. I am motivated by understanding how architectural decisions translate into real performance and correctness at the hardware level, and I prefer working close to the RTL where design choices have measurable impact. My academic journey and hands-on project work have shaped a design-first mindset, complemented by a growing appreciation for disciplined verification as an essential part of building reliable digital systems.

I have previously been associated with the NUST Chip Design Centre (NCDC), where early exposure to chip-level thinking, processor fundamentals, and structured engineering workflows helped solidify my interest in processor design and verification. Since then, I have continued to refine my technical direction through advanced coursework and project-driven learning, with an emphasis on writing, analyzing, and improving digital designs rather than treating them as black boxes.

At present, my objectives are centered on developing into a capable digital design engineer who can contribute meaningfully to processor and accelerator development teams. Alongside design, I am intentionally strengthening my verification skills to ensure correctness and robustness in complex systems. In parallel, I am building foundational knowledge in machine learning to better understand modern compute workloads from a hardware execution perspective, with the long-term goal of working on hardware that
is informed by, and optimized for, emerging ML-driven applications.

EDUCATION

Bachelors in electrical engineering (BEE)

School of Electrical Engineering and Computer Sciences (SEECS) , Islamabad , 3.61/4.0 (2026)

INTERNSHIP EXPERIENCE

NUST Chip Design Centre (NCDC)

10-Jun-2025 - 29-Aug-2026

I begin working with NUST Chip Design Centre (NCDC) as a trainee in February, where I underwent structured training in core areas of digital design, computer architecture, and embedded systems. During this phase, I focused on strengthening my fundamentals in C/C++, Digital Logic Design, RISC-V assembly, and processor-level concepts, with particular emphasis on understanding instruction execution, datapath behavior, and hardware–software interaction. This period provided the foundational knowledge required to transition into hands-on RTL and processor-related work. Following the training phase, I continued at NCDC as a summer intern, where the focus shifted toward practical application of the acquired concepts. During the internship, I worked on processor-oriented tasks involving RTL design exposure, instruction decoding concepts, and microarchitectural understanding of RISC-based systems. I gained hands-on experience with hardware description languages, simulation workflows, and system-level thinking required for processor integration and verification. The internship helped bridge theoretical knowledge with real-world chip design practices and played a significant role in shaping my interest in digital design, processor microarchitecture, and design verification.

FINAL YEAR PROJECT

Performance Enhanced Implementation of a RISC-V Vector Processor

The Final Year Project focuses on the performance-oriented redesign of a RISC-V vector processor to address throughput limitations observed in a baseline single-lane, 32-bit implementation. The work concentrates on architectural and RTL-level enhancements aimed at improving execution e**ffi**ciency for compute-intensive workloads. A key aspect of the project involves redesigning the vector core to incorporate memory banking mechanisms that reduce memory access contention and enable higher data throughput. In parallel, instruction-level parallelism is explored by identifying and packing independent vector instructions for concurrent execution, thereby improving utilization of vector resources and reducing overall cycle counts. The project also involves contributing to datapath

enhancements to support scalable execution and prepare the design for wider data paths. The primary contribution lies in the RTL redesign and optimization of the vector processor microarchitecture, with emphasis on performance-driven design decisions rather than feature expansion. Functional correctness is ensured through a staged verification strategy, beginning with module-level directed testbenches developed in Vivado to validate individual RTL components. System-level verification is subsequently performed using QuestaSim, where execution traces are compared against the Spike reference model to confirm architectural correctness. RISC-V DV methodologies are employed to strengthen verification coverage and improve confidence in design robustness. Performance improvements are evaluated through cycle-count analysis and direct comparison with the baseline single-lane vector design, providing quantitative insight into the impact of the architectural modifications. Subject to project timelines, the design is also being prepared for potential FPGA validation on a Nexys A7 platform to demonstrate end-to-end functionality in a hardware environment.

TECHNICAL EXPERTISE

RTL Design & Processor Microarchitecture

Designing and redesigning RTL using SystemVerilog and Verilog with a focus on RISC-V–based processor architectures. Actively working on vector processor microarchitecture, including datapath modifications and performance-driven redesign decisions.

Performance Optimization & Parallel Execution

Applying architectural optimization techniques such as memory banking and instruction-level parallelism to improve execution throughput. Evaluating performance improvements through cycle-count analysis and comparison against baseline processor implementations.

Design Verification

Verifying digital designs using a structured flow that begins with module-level directed testbenches and extends to system-level simulation. Ensuring architectural correctness through reference-model-based verification using Spike and simulator-based debugging. Studying Digital Design Verification as a course ...

Verification Tools & Methodologies

Using industry-standard tools such as QuestaSim and Vivado for simulation and verification and leveraging RISC-V DV methodologies to improve verification coverage and robustness. Understanding concepts of UVM Verification and use them to enhance industry level skills.

Machine Learning (Developing)

Building foundational knowledge in deep learning and machine learning, with ongoing project-based learning focused on understanding ML and DL computational patterns and their relevance to industry level problem solving.

Ayesha Hussain

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PROFESSIONAL PROFILE

Dedicated and detail-oriented final-year Electrical Engineering student with a strong blend of technical expertise and cross-functional skills. Seeking co-op opportunities to gain hands-on experience, apply theoretical knowledge in real-world settings, contribute to innovative technology-driven projects, and make a positive impact on society through collaborative teamwork.

EDUCATION

BS Electrical Engineering

SEECS-NUST , Islamabad , 2.95 (2026)

INTERNSHIP EXPERIENCE

Auximo TechGmbH

03-Feb-2026 - 30-Apr-2026

Gained hands-on experience in Robotic Process Automation (RPA)and theMicrosoft Power Platform (Power Automate, Power Apps, Power BI, Power Pages).

Communication Systems&Networking(CSN)Lab

16-Jun-2025 - 15-Aug-2025

Worked on UAV hardware integration, Edge AI algorithms, computer vision, sensor fusion, and embedded systems for real-time wildfire detection.

Islamabad CarriageFactory

15-Jul-2024 - 16-Aug-2024

Observed interdisciplinary engineering workflows, industrial processes, and ongoing international railway modernization projects.

FINAL YEAR PROJECT

AI-Powered Drone System for Early Wildfire Detection and Prevention

This FYDP aims to develop an AI-powered drone system for early wildfire detection and prevention by integrating computer vision, thermal imaging, and environmental sensor data. Additionally, autonomous drone navigation using SLAM and GPS tracking will ensure efficient fire monitoring and surveillance in large forested areas. The project will also focus on onboard AI deployment on edge devices for real-time inference, optimizing processing speed and minimizing response time. A real-time alert system will be developed

to send early warning notifications with GPS coordinates to firefighting agencies and disaster response teams. Furthermore, a web/mobile dashboard will be created for remote monitoring, providing a user-friendly interface for real-time fire visualization and predictive analytics.

TECHNICAL EXPERTISE

Research Assistant – AI-Enhanced USV Swarm Project

Intelligent Digital Twin Lab (IDTL), SINES, NUST Supervisor: Dr. Mian Ilyas, Principal SINES Worked on autonomous USV swarm development for water quality monitoring. Experience with Pixhawk, MAVProxy, Mission Planner, LoRa, STM32, and sensor interfacing. Assisting in swarm testing, GUI-based sensor valida ...

Jetson Warrior – Jetson Nano Primers Initiative

SEECS, NUST Supervisor: Dr. Tauseef-ur-Rehman Supporting workshops on AI and Computer Vision on the Edge using NVIDIA

Jetson Nano. Guiding students in deploying AI/CV models and assisting with technical setup and peer mentoring.

Mian Tahir Nadeem

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PROFESSIONAL PROFILE

Highly motivated Electrical Engineering undergraduate at NUST with strong academic standing (CGPA 3.77/4.0) and hands-on experience in Analog, RF, and Mixed-Signal IC Design. Currently working on a wideband tunable Variable Gain Amplifier (7–24 GHz) for 6G transmitter front-ends, with practical exposure to Cadence Virtuoso, schematic design, layout, and post-layout verification. Research-oriented candidate with experience in wireless communication systems, RIS-assisted networks, and deep learning with strong analytical skills, circuit design expertise, and research aptitude.

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering and Computer Science (SEECS) NUST , Islamabad , 3.77 (2026)

INTERNSHIP EXPERIENCE

Deep LearningLab,SEECS-NUST

01-Jun-2023 - 02-Sep-2023

Worked on automated image classification using deep learning techniques. Achieved improved accuracy compared to classical machine learning methods such as Support Vector Machines (SVMs). Contributed to data preprocessing, model training, and performance evaluation.

Information Processing & Transmission Lab (IPT), SEECS-NUST

09-May-2024 - 07-Sep-2024

Conducted research on Non-Orthogonal Multiple Access (NOMA) and Orthogonal Multiple Access (OMA) techniques for next- generation wireless systems. Investigated Reconfigurable Intelligent Surfaces (RIS) to enhance spectral e**ffi**ciency and system capacity. Assisted in simulation, performance evaluation, and documentation of RIS-assisted communication models, contributing to lab reports and ongoing publications

NUST Chip Design Centre (NCDC), SINES – Islamabad

01-Jan-2025 - 27-Jan-2026

Completed intensive training in Analog and Mixed-Signal IC Design covering MOSFET physics, current mirrors, di**ff**erential amplifiers, frequency response analysis, bandgap references, OTAs, oscillators, PLLs, and comparators. Designed, simulated, and verified multiple analog building blocks using Cadence Virtuoso (65 nm PDK). Performed layout design and post-layout simulations for single- stage amplifiers and Operational Transconductance Amplifiers (OTAs). Gained practical understanding of IC fabrication flow and layout-level performance trade-offs.

FINAL YEAR PROJECT

Wideband Tunable Variable Gain Amplifier (7–24 GHz) for Phased-Array Based 6G Transmitter Front-End

Designing a wideband, tunable Variable Gain Amplifier (VGA) operating from 7–24 GHz, targeting FR3 and emerging 6G frequency bands. The project is conducted as part of a collaborative research initiative between NUST and King Abdullah University of Science and Technology (KAUST), focusing on phased-array transmitter architectures for next-generation wireless systems. The VGA is intended to function as a core building block in phased-array front-ends, enabling element-level gain control essential for beam steering, beamforming, and array calibration. Emphasis was placed on adaptive gain control, high linearity, low noise performance, and wideband impedance matching, ensuring robustness across multi-band phased-array operation. Objective: complete schematic

design, physical layout, and post-layout verification using Cadence Virtuoso, adhering to foundry design rules. The design is tapeout-ready, with finalized layout, DRC/LVS clean, and validated post-layout performance, making it suitable for integration into array-based 6G transmitter ICs

TECHNICAL EXPERTISE

Skills

IC Design & RF: Analog & Mixed-Signal IC Design, RF & Microwave Circuit Design, OTA, Current Mirrors, Di**ff**erential Amplifiers,Layout Design, DRC/LVS, Post-Layout Simulation Programming & HDL: Python, C/C++, MATLAB, Verilog / VHDL, LaTeX Tools & Platforms: Cadence Virtuoso, LTspice, ModelSim, Quartus, MA ...

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PROFESSIONAL PROFILE

Highly motivated and detail-oriented electrical engineering student at NUST with strong interests in web development, artificial intelligence, machine learning, embedded systems, and smart technologies. Proficient in MATLAB, C/C++, Python, JavaScript, CSS, and HTML, with hands-on experience in developing web applications, including interactive interfaces integrated with IoT devices. Experienced in automation systems, fault detection, electronic circuit design, and IoT-based solutions. Demonstrated leadership through key university roles, with proven abilities in team management and successful project execution. Eager to contribute technical
expertise and deliver innovative solutions in dynamic engineering environments, while continuing to expand skills in web development,
AI, and IoT.

EDUCATION

Electrical Engineering

School of Electrical Engineering and Computer Science(SEECS) , Islamabad , 3.01 (2026)

INTERNSHIP EXPERIENCE

Communication SystemandNetworkingLab,SEECS

01-Jul-2025 - 09-Sep-2025

• Developed a web application that displays live temperature and humidity data from an ESP32 and sensor, with updates every 2 seconds. • Integrated the ESP32 with the sensor to fetch real-time data and dynamically update the web interface. • Gained hands-on experience with front-end technologies, including HTML, CSS, JavaScript, and web integration with IoT devices.

KoreaEHT | Seoul,SouthKorea

04-Jun-2024 - 14-Sep-2024

• Conducted research on electric heating cable applications in power plants to improve system e**ffi**ciency. • Documented technical specifications and conducted competitive analysis of industry-standard EHT solutions. • Collaborated remotely with international engineering teams, contributing insights to optimize electrical system designs. • Presented findings in virtual meetings, sharpening technical communication and documentation skills.

FINAL YEAR PROJECT

Smart Healthcare IoT solution for Type II Diabetes management

• Designing and developing a non-invasive glucose monitoring device using infrared (IR) technology to measure glucose levels through the skin. • Creating a mobile application that integrates with the device to monitor glucose levels in real-time, providing users with notifications when their levels exceed predefined thresholds. • Aiming to provide a user-friendly solution for continuous glucose monitoring without the need for blood samples, enhancing accessibility for individuals managing diabetes or those at risk. • Currently
in the prototyping phase, with ongoing efforts to refine accuracy, user experience, and app functionality.

TECHNICAL EXPERTISE

Programming Languages

C, C++, Embedded C, Python

Software & Tools

MATLAB, Proteus, Arduino IDE, Processing, Microsoft Office Suite

Technical Skills

Embedded Systems Design, Circuit Analysis, IoT Integration, Electronic Circuit Design, Machine Learning, Web Technologies (HTML, CSS, JavaScript)

Soft Skills

Leadership, Team Collaboration, Adaptive Learning, Technical Documentation

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PROFESSIONAL PROFILE

Final-semester Electrical Engineering student with a strong academic and practical focus on computer architecture, digital design, RTL development, and hardware architecture. Developed a solid understanding of designing hardware systems from architectural-level concepts down to RTL implementation, with an emphasis on correctness, efficiency, and performance optimization. Experienced
in applying theoretical knowledge through structured coursework, internships, and team-based projects, including hardware-oriented problem solving and interface design. Highly motivated to begin a career in hardware, digital, or computer architecture roles, with a keen interest in building efficient and scalable hardware systems.

EDUCATION

BSc Electrical Engineering
SEECS , Islamabad , 3.15 (2022)

INTERNSHIP EXPERIENCE

Heavy IndustriesTaxila
24-Jun-2024 - 16-Aug-2024

Implemented FSM designs in Verilog HDL using Intel Quartus, including simulation, synthesis, and on-board testing on the DE2-115 FPGA.

Korea EHT
20-Jul-2024 - 18-Sep-2024

Learned core Electrical Heat Tracing concepts, then designed the GUI for an automated EHT solution recommendation app.

FINAL YEAR PROJECT

An Optimized Hardware Architecture for the Number Theoretic Transform in CRYSTALS-Kyber
Designing an optimized hardware architecture for the Number Theoretic Transform (NTT) in the CRYSTALS-Kyber post-quantum cryptographic scheme, focusing on performance and efficiency.

TECHNICAL EXPERTISE

Hardware & RTL Design
Strong foundation in computer architecture, digital design, RTL development, and hardware architecture with a focus on e**ffi**cient and optimized system design.

Hanzla Sajjad

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PROFESSIONAL PROFILE

Final-year Electrical Engineering undergraduate at NUST specializing in **Power Systems and Control Engineering**, with hands-on

experience in**Powerelectronics,MATLAB/Simulink modeling,andSmart gridapplications**.Co-founderof a**Smart Grid Solutions** startup with a strong focus on **sustainable energy solutions** and practical experience in **Machine learning and Deep**
learning algorithms for intelligent energy and system optimization.

EDUCATION

BE Electrical

School of Electrical Engineering and Computer Science SEECS , Islamabad (2026)

INTERNSHIP EXPERIENCE

Water andPowerDevelopmentAuthority(WAPDA)

22-Jul-2024 - 19-Aug-2024

Internship Trainee at WAPDA ENGINEERING ACADEMY Faisalabad, Pakistan – Gained exposure to power generation, transmission, and grid operations. – Assisted in equipment testing and grid stability practices.

Bestway CementLimited

09-Jul-2025 - 19-Aug-2025

Electrical Engineering Intern Chakwal, Pakistan – I gained hands-on exposure to industrial power systems and their practical applications. – I learned how large-scale electrical operations are managed and maintained in a cement plant. – The experience enhanced my technical knowledge, teamwork, and professional skills.

Research Work

24-Apr-2025 - 31-May-2025

Detection of Tsunamis and Earthquakes through Underwater Sensor Networks Co-authored a research book chapter focused on underwater sensor networks and sonar-based communication systems for early detection of tsunamis and earthquakes. The work was conducted as part of the Communication Systems course under faculty supervision and has been published in an IET book. The chapter is publicly available on IET Publications and ResearchGate.

FINAL YEAR PROJECT

Smart PLC-Based Multi-Source Power Management System with Cost Optimization and Maintenance-Aware Switching

Designed and implemented a PLC-controlled power management system integrating WAPDA grid, dual generators, and UPS, with intelligent source selection, load-shedding, protective relays, maintenance bypass lines, and HMI monitoring for uninterrupted, safe, and cost-optimized operation.

TECHNICAL EXPERTISE

Technical Expertise

Power Systems & Smart Grids, Power Electronics (Inverters, DC–DC Converters, MPPT), Control Systems & PLC Programming. Automation & HMI Design, MATLAB & Simulink Modeling, Machine Learning & Deep Learning Algorithms, Programming: Python, C/C++, Assembly, IoT & Energy Monitoring Systems.

Muhammad Umair Ajmal

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PROFESSIONAL PROFILE

Final Year Electrical Engineering student at NUST specializing in **FPGA-based digital systems, SoC architectures, and Edge-AI acceleration**. Hands-on experience through internships at **NUST Chip Design Centre (NCDC)** and **SoC Lab**, working on **RTL**

design, processor architecture, andAI-orientedhardwaresystems. Strong foundationin **Verilog/SystemVerilog,C/C++, RISC-V**, and **Machine Learning, Deep Learning, and Computer Vision**, with an active Final Year Project focused on **FPGA-powered real-time medical diagnosis and automated report generation using CNNs and LLMs**.

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering and Computer Science, NUST , Islamabad , 3.14/4.00 (2022 – 2026)

INTERNSHIP EXPERIENCE

Nust ChipDesignCentre(NCDC),NUST

10-Jun-2025 - 29-Aug-2025

Completed structured training in C/C++, Digital Logic Design, RISC-V Assembly, and Computer Architecture. Contributed to SoC-level AI project, implementing Vision Transformers for clinical data classification. Developed and tested modules for attention mechanisms, cross-attention layers, and dataflow pipelines on simulation. Gained hands-on experience in hardware-software co-design, understanding latency, throughput, and memory optimization for AI workloads. Collaborated in a team environment, practicing version control, code reviews, and testbench-driven verification.

System OnChip(SOC)Lab,NUST

23-Jun-2024 - 10-Aug-2024

Designed and implemented a real-time FPGA-based digital clock using Verilog HDL. Developed a custom 8-bit processor architecture, including datapath, ALU, and control unit, validated via simulation. Implemented finite state machines (FSMs) and performed timing analysis for clocked operations. Worked on RTL simulation, synthesis, and verification to ensure correct functionality. Strengthened skills in FPGA prototyping, resource utilization optimization, and debugging.

FINAL YEAR PROJECT

Edge-AI Accelerator: FPGA-Powered Real-Time Diagnosis and Report Generation

Designing an FPGA-based Edge-AI accelerator on Xilinx Virtex-7 for real-time medical diagnosis. Implementing Convolutional Neural Networks (CNNs) for image classification on FPGA. Using tools like Vivado, Vivado HLS for implementation. Exploring parallelism, pipelining, and memory optimization for high-throughput, low-latency inference. Integrating Large Language Models (LLMs) to generate automated clinical reports from diagnosis outputs. Experimenting with FPGA resource allocation, BRAM utilization, and DSP optimization to accelerate AI workloads.

TECHNICAL EXPERTISE

Hardware & FPGA Design

Verilog, SystemVerilog, RTL Design, FSMs, ALUs, Multipliers, Custom Processor Design, FPGA Prototyping, Timing-Aware Design, Resource Optimization, SPI, and Digital Interfaces

Computer Architecture & SoC

RISC-V Assembly and Simulation. Datapath and Control Unit Design. Hardware–Software Co-Design and Optimization. RISCV

Processor with Pipelining.

Machine Learning & Deep Learning

Supervised & Unsupervised Learning (KNN, Linear/Logistic Regression, SVM). Neural Networks, CNNs, RNNs, and Deep Learning Architectures. Attention Mechanisms, Vision Transformers (Self-Attention, Cross-Attention). Model Evaluation: Precision, Recall, F1, AUC. Frameworks: TensorFlow, Keras, PyTorch ...

Computer Vision

Image Processing: Filtering, Edge & Feature Detection (Canny, Harris, SIFT, SURF). Camera Models, Calibration, Homography, Perspective Transformations. CNN-based Vision Models (U-Net, YOLO), Image Segmentation, Optical Flow. Pose Estimation, Structure from Motion, Depth Estimation, and Basic 3D Vi ...

Programming & Tools

C, C++,Embedded C, Python, MATLAB, AutoCAD, Atmel Studio, Venus Debugger, ModelSim, Proteus, Pspice, Google Colab, VS code, Visual Studio. Intel Quartus, Xilinx Vivado, Vivado HLS,

Aima Ghaffar

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate at NUST with a strong foundation in core electrical and telecommunication systems, including circuits, signal processing, control, and mobile communications. Possess practical experience in machine learning and computer vision through academic and project work, with a growing interest in AI-driven engineering applications. Currently developing a Secure AI-Driven Healthcare System as a Final Year Project, integrating intelligent models with real-time health monitoring and secure data handling. Motivated to contribute to innovative electrical and telecom solutions while continuously learning and advancing in modern engineering technologies.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 2.54 (2026)

INTERNSHIP EXPERIENCE

Al-Raheem Technologies(NSTP)

01-Jun-2024 - 01-Sep-2024

Built a GSM-based Harmful Object-Detection System with Camera Developed embedded prototypes using C/C++ and micro-controller

Siber Koza(NationalAirforceTechnologyPark)

01-Jul-2025 - 01-Sep-2025

Worked with jetson nano microcontrollers on embedded systems Gained experience in LLM and AI for developing a smart appointment booking device

FINAL YEAR PROJECT

Secure AI-Driven Healthcare System for Disease Diagnosis and Patient Management

features AI chatbot, doctor recommendation, chat/video consultations, and real-time health monitoring. Integrated with Role-Based Access Control (RBAC), End-to-End Encryption, and AI disease detection models to ensure data security and privacy.

TECHNICAL EXPERTISE

Frontend development

React,next.js,css,html,javascript

Programming Languages

C,C++,Python

Circuit Design and Analysis, Testing, Troubleshooting ,Simulations

I can design a circuit and make simulations on different softwares like ltspice,pspice,autocad,proteus,matlab,multisim,simulink,ardunio ide,labVIEW,verilog

Machine learning and computer vision

Python (NumPy, PyTorch, TensorFlow) OpenCV – Computer vision Jupyter / Colab

Communication Skills, Creativity, Critical Thinking
Extracurricular's: General Secretary – NUST FitnessClub | Member – NUST Literature Club, ASME, Dramatics Club| Active Member – SARROSH ADR Centre | Olympiad & Piston Cup Participant | HRCA & ISMO Awardee

Telecommunication
-wireshark,ciscopackettracer -TCP/IP and network traffic inspection -Basic network simulation and performance analysis

Sarah Sohail

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PROFESSIONAL PROFILE

Enthusiastic Electrical Engineering student passionate about digital systems, FPGAs, and Embedded Systems. Skilled in Verilog/SystemVerilog with hands-on experience in RISC-V processor design and FPGA-based implementations. Strong background in Computer Architecture, with research in In-Memory Computing and energy-efficient architectures for advanced AI/ML applications.

EDUCATION

BE Electrical Engineering

SEECS , Islamabad , 3.74/4.00 (2026)

INTERNSHIP EXPERIENCE

System onChipLab,SINESNUST

16-Aug-2024 - 16-Aug-2025

Undergraduate Research Assistant: • Designed a Quadrature Encoder Interface on the RM57Lx 16/32-bit RISC Flash Microcontroller using SystemVerilog, meeting memory constraints and encoder-specific interrupt requirements. • Validated design for hardware implementation, supporting ongoing research projects. • Conducting research in In-Memory Computing with DRAM architectures to explore performance and efficiency gains.

Arcelik-Dawlanc e R&DCenter

03-Jul-2025 - 08-Aug-2025

Embedded Systems Intern • Worked on 5 di**ff**erent radar modules, evaluating performance and integration for human tracking applications. • Enhanced radar-based human tracking system by improving algorithm robustness, accuracy, and e**ffi**ciency. • Developed and optimized real-time GUI tool for data visualization, ensuring smooth performance and reliability. • Contributed to system integration and testing, aligning solutions with industrial standards for energy-efficient home automation.

System onChipLab,SINESNUST

03-Jun-2024 - 31-Jul-2024

RTL Design Intern • Implemented and designed processors in Verilog, gaining practical insights into computer architecture concepts. • Designed a Morse Code encoder in Verilog along with successful deployment on the DE1-SoC board. • Integrated and utilized the VGA Adapter core from the University of Toronto for hardware-based display applications.

United InternationalTechnologies,IslamabadPakistan

03-Jun-2024 - 30-Aug-2024

Electrical Engineering Intern • Developed an interactive GUI with LabWindows CVI for the Super Mushshak Simulator, improving simulator usability and visualization. • Applied industrial-standard design practices in C, ensuring a reliable and user-friendly interface.

American Space,LincolnCornerNUST

02-Oct-2023 - 29-Mar-2024

Friend of Corner • Built cross-cultural communication skills through collaboration, strengthening public diplomacy and international relations. • Gained hands-on experience in project management and event organization, ensuring successful workshop execution.

FINAL YEAR PROJECT

IMPACT SoC: In-Memory Computing based Architecture for Transformer Models

IMPACT SoCproposes an In-Memory Computingbased Architectureto accelerate transformermodels by tightly coupling memory and computation. The design targets compute-intensive transformer modules such as attention and feed-forward networks, reducing data movement overhead, improving energy e**ffi**ciency, and achieving faster inference compared to conventional von Neumann architectures.

TECHNICAL EXPERTISE

Hardware Description Languages

Verilog, System Verilog

Programming Languages

C/C++,Python,MATLAB,Scratch,AVR Assembly Language

Software Tools

Quartus, Vivado, Cadence Virtuoso, Modelsim, Arduino, VS Code, Visual Studio, Proteus, LabWindows CVI, LabView, Proteus, LTSpice, PSpice, AutoCad, TinkerCad

Languages

Urdu–Native,English– Fluent (Professional Proficiency), Turkish– Intermediate (Conversational), German– Beginner (A1.1 Level)

Muhammad Taaha Younas

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PROFESSIONAL PROFILE

A versatile skill set and a quick learning mind. Decent work ethic with Proficiency in working tools. Special attention to detail and problem solving.

EDUCATION

BE Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 2.39 (2026)

INTERNSHIP EXPERIENCE

Communication SystemsandNetworkingLab

04-Jul-2025 - 29-Aug-2025

Basics of ROS SITL UAV Flights using PX4 Autopilot Python Programming and SDF World Files

FINAL YEAR PROJECT

Digital Twin of UAV

A virtual twin of a UAV taking all the resource intensive programming and testing o**ff** of an actual drone and doing it on Ground Station, and leading the actual drone, making hardware a follower. Skill Set: Robot Operating System (ROS) Python Prgramming C Programming PX4 Autopilot / Ardupilot Blender - Model Creation Gazebo - World Generation Raspberry Pi - Companion Computer

TECHNICAL EXPERTISE

RISC-V Core Design and Verification

Designed a fully pipelined RISC-V core. Verified it through Regression Testing, using custom DMEM and IMEM images and then comparing it to Spike output online

Robot Operating System

Proficient in working with ROS for fully automating and implementing a communication model in UAV using custom written scripts.

Embedded Programming

Proficient in optimizing hardware usage using C programming for Microcontrollers. Work experience in using STM32 and ATMega Devices. Proficient in Arduino, ESP Programming

Muhammad Talha Hassan

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PROFESSIONAL PROFILE

I am a Final-year BS Electrical Engineering student at NUST with a minor in Artificial Intelligence and a strong interest in machine learning and deep learning research. My academic and lab experience includes working on large language models, reinforcement learning, and multimodal signal processing. I enjoy building practical ML systems that combine solid theory with real-world impact. Currently, I am focused on expanding my research skills and contributing to data-driven and AI-focused projects.

EDUCATION

BS Electrical Engineering

SEECS , Islamabad , 3.66 (2026)

INTERNSHIP EXPERIENCE

Deep LearningLabSINES,NUST

01-Jun-2025 - 31-Aug-2025

Gained hands-on experience with LLaMA- and DeepSeek-style transformer architectures for large language models, including the implementation and analysis of advanced components such as Grouped Multi-Query Attention, Rotary Positional Embeddings (RoPE), and SwiGLU activations. Worked with state-of-the-art models including LLaMA-2-7B, LLaMA-4-17B-16E, DeepSeek-V3, and DeepSeek-R1 to study modern reasoning-oriented LLM designs. Implemented the LLMCompass framework for FPGA deployment on the Xilinx ALVEO platform, providing simulation, performance analysis, and documentation to support e**ffi**cient hardware acceleration of large language models.

MachVis LabSEECS,NUST

01-Jun-2023 - 31-Aug-2023

This internship focused on geospatial data processing and machine learning fundamentals. Developed a Python-based pipeline to convert point-based geospatial data into polygonal boundaries using Shapely, implementing convex hull and alpha shape algorithms for accurate region delineation. Built interactive geographic visualizations using Folium to effectively represent spatial insights.

FINAL YEAR PROJECT

Ghaat: AI-Powered Autonomous Aerial Security

This project focuses on the design and development of an autonomous hexacopter interceptor capable of stable flight with real-time detection, tracking, and interception of rogue drones. It aims to implement onboard AI and edge computing for processing live video feeds to enable target identification and trajectory planning. The system integrates stereo vision to achieve accurate depth perception and localization. Research conducted on an autonomous capture mechanism to neutralize or secure target drones without human intervention.

TECHNICAL EXPERTISE

Artificial Intelligence/Machine Learning

Strong foundation in machine learning and deep learning with hands-on experience in Transformer-based architectures, Large Language Models, and reinforcement learning. Worked on computer vision and multimodal learning problems involving attention mechanisms, representation learning, and real-world datasets, w ...

Ahmad Abdullah

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PROFESSIONAL PROFILE

- To build a strong and successful career in the field of **engineering and technology**.
- To apply my **knowledge, skills, and problem-solving abilities** in a professional working environment.
- To gain **practical experience** and continuously improve my technical and analytical skills.
- To work in a challenging environment focused on **digital systems, embedded systems, and hardware design**.
- To contribute to projects involving **processor design, digital ICs, and modern electronic systems** while growing as an engineer.

EDUCATION

Electrical Engineering

National University fo Sciences and Technology , Islamabad , 3.06 (2026)

INTERNSHIP EXPERIENCE

NUST Chip Design Center

09-Jun-2025 - 28-Aug-2025

We covered labs and exams on the following four modules: 1. C Programming 2. Digital Logic Design 3. RISC-V Assembly Language 4. Computer Architecture

FINAL YEAR PROJECT

ASIC Design of Advanced Encryption Standard (AES)

This project presents an ASIC design of the Advanced Encryption Standard (AES) aimed at developing a flexible, high-performance hardware encryption core suitable for modern secure systems. The design supports 128-, 192-, and 256-bit key sizes and multiple modes of operation including ECB, CBC, CFB, OFB, and CTR, enabling broad applicability across embedded and security-critical platforms. The motivation behind this work is to address the growing need for e**ffi**cient hardware-based encryption by replacing software-heavy implementations with a compact and secure ASIC solution. The architecture integrates both encryption and decryption within a unified core, reducing system complexity and improving integration e**ffi**ciency. The project follows a structured hardware design flow, starting from literature review and micro-architecture design to RTL implementation, UVM-based verification, and synthesis, with layout considerations for ASIC deployment. Functional verification confirms correct AES operation and successful single-core encryption/decryption capability across supported modes. The final design emphasizes modularity, scalability, and compatibility with various key sizes, making it suitable for integration into secure embedded systems, processors, and SoCs. Overall, this work demonstrates a practical understanding of hardware cryptography, digital IC design methodology, and end-to-end ASIC development practices.

TECHNICAL EXPERTISE

Digital System Design & Processor Architecture

I design and implement complex digital systems using Hardware Description Languages (HDLs) like Verilog and SystemVerilog. My core expertise lies in developing multi-stage pipelined architectures, where I architect data paths and control units to handle instruction execution and hazard detection efficiently. ...

Embedded Systems & Firmware Development

Ispecialize in thedesign anddevelopment ofembedded systems, focusing on low-level firmware and hardware-software co-design. My technical foundation includes extensive training in C programming and RISC-V assembly language, which I leverage to optimize software performance on custom architectures. By bridg ...

Software Engineering & Programming

Iamproficientindeveloping scalableande ffi cient software solutions using C and C++. My expertise focuses on building robust applications, implementing complex algorithms, and ensuring high-performance code execution across various platforms. I am adept
at utilizing modular software design principles and ...

Zeeshan Haider

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PROFESSIONAL PROFILE

I'm a final-year Electrical Engineering student at NUST, and I've built a solid base in control systems, electronics, and digital logic. I like diving into projects that mix classic engineering with newer skills like embedded systems and computer vision, to create smart, automated solutions. My hands-on work covers everything from building hardware stabilization units (like gimbals), to setting up real-time visual tracking, to working with FPGA-based systems. Now, I'm looking for a role in Embedded Systems,Computer Vision, Electrical or Instrumentation engineering where I can put my system design and automation skills to work and take on tough problems head-on.

EDUCATION

BE Electrical Engineering

SEECS , Islamabad , 2.6 (4th)

INTERNSHIP EXPERIENCE

Korea EHT

20-Jul-2024 - 18-Sep-2024

Engineering Intern KoreaEHT (Remote) | July 2024 – Sep 2024 Gained specialized knowledge in Electrical Heat Tracing (EHT) systems for industrial piping, tanks, and freeze protection applications. Analyzed technical specifications for diverse heating solutions, including Mineral Insulated (MI) and Self-Regulating cables, to understand their application in hazardous and non-hazardous zones. Assisted in the transition from manual estimation to a digital platform by mapping out engineering constraints and cable selection logic. Collaborated with the marketing team to enhance digital presence, translating technical product features into accessible content for social media engagement.

System onChip(SoC)Lab,SEECSNUST

15-Jun-2025 - 15-Sep-2025

Research Intern System on Chip (SoC) Lab, SEECS NUST | June 2025 – Sep 2025 Worked on the initial R&D phase of the "Edge-AI Accelerator" project, focusing on FPGA-powered solutions for medical healthcare. Deepened technical expertise in Digital System Design through hands-on exercises and study of advanced logic synthesis techniques. Performed a comprehensive feasibility analysis (Literature Review) to select the best algorithms for on-chip medical diagnosis. Collaborated with research advisors to finalize the project roadmap, demonstrating diligence in executing complex technical tasks.

FINAL YEAR PROJECT

Edge-AI Accelerator: FPGA-Powered Real-Time Diagnosis and Report Genetration

Our Final Year Project focuses on the design and implementation of an Edge AI accelerator using a Xilinx Virtex-7 FPGA for medical imaging based disease diagnosis and automated report generation specifically targeting healthcare challenges in Pakistan's rural and resource-constrained areas.

TECHNICAL EXPERTISE

Embedded Systems Design

Hands-on experience in designing and implementing embedded systems, including hardware software integration, sensor interfacing, and real-time control applications.

Computer Vision
Hands-on experiencewith classical computer vision techniques, including optical flow based real-time object tracking and trajectory mapping. Strong understanding of motion estimation, feature tracking, and frame-to-frame analysis in video streams.

Machine Learning/Deep Learning
Ihave studied coreMachineLearning concepts and Implemented predictive models for real world applications. Currently learning deep learning concepts, architectures and training methodologies along with practical implementations.

Instrumentation and Electronics Engineering
Ihavestudied industrialinstrumentationprinciples including measurement of temperature, pressure, flow, and level along with sensor characteristics, calibration techniques, static and dynamic characteristics and error analysis. Hands-on experience through labs and academic project.

Control Systems
Ihave strongunderstanding of Linear Control Systems including system modeling, transfer functions, stability analysis, and time-domain response. Practical exposure through laboratory work and a control-based project.

Khansa Mishqat

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at NUST with a specialized focus on **Digital System Design, Embedded Systems, and AI Hardware Acceleration**. Gained industry experience during a research internship at **NECOP**, where i in a team designed and modified **AXI/DMA-based data transfer systems** and custom control logic on FPGA. Currently working on a high-speed **AI accelerator for YOLOv8 inference** on the Xilinx ZCU102 platform to optimize real-time latency and throughput.

Proficientinlanguageslike**Verilog/SystemVerilog,Python,C++andAssembly** and tools **like Vivado, Quartus, Matlab, Pspice and Proteus**, with a strong interest in edge AI and secure hardware architecture.

EDUCATION

Bachelor of Electrical Engineering

SEECS , Islamabad , 3.02 (2026)

INTERNSHIP EXPERIENCE

NECOP

23-Jun-2025 - 23-Sep-2025

The key higlights of my internship were: 1. Studied modern hardware accelerator architectures to understand how computation and data movement are designed together. 2. Worked with a DMA loopback–based accelerator design and learned how data is transferred between the Processing System (PS) and Programmable Logic (PL) using AXI interfaces. 3. Modified the design to support two input streams and added buffers inside the processing loop, controlled from the PS side, to manage data flow.

FINAL YEAR PROJECT

High Speed AI Accelerator on FPGA for Real-Time Object Detection

Designed and implemented an FPGA-based AI accelerator for real-time object detection and classification, using custom hardware IPs to speed up the compute-heavy parts of a YOLO-based model while the processing system manages control and integration. The system is built in a modular way with clear PS–PL communication, keeping the overall design simple and extendable.

TECHNICAL EXPERTISE

FPGA & Digital Systems Design

Verilog, SystemVerilog, Vivado, Vitis, Quartus, ModelSim, RISC-V, AXI Protocol.

Programming

C/C++, Python and Assembly

Embedded Systems

Embedded C, Microcontroller Programming, GPIO & Peripheral Interfacing, I2C, SPI, UART Microcontrollers: Arduino, ATmega328P, ATmega16A, STM32, ESP32 Tools: Arduino IDE, Atmel Studio, STM32CubeIDE

Machine Learning

Data Cleaning & Preprocessing, Feature Extraction, Supervised & Unsupervised Learning, Linear & Logistic Regression, Decision Trees, SVM, K-Nearest Neighbors, Clustering, Dimensionality Reduction (PCA)

Deep Learning
ArtificialNeural Networks (ANNs), Convolutional Neural Networks (CNNs), PyTorch, TensorFlow, Keras, NumPy, Pandas, Matplotlib, Model Training & Optimization

Development Tools & Platforms
VSCode,JupyterNotebook,GoogleColab, MATLAB & Simulink, Proteus, Multisim, PSpice, LabVIEW, AutoCAD, Venus RISC-V Simulator

Sudais Akbar Khan

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PROFESSIONAL PROFILE

Final year student, pursuing a Bachelor of Engineering in Electrical Engineering at NUST. With expertise in embedded systems, PCB design, and finite element modeling (FEM). Recent experience includes designing Halbach magnets for ship-towing robots at Towbotic Systems and leading UAV design projects at Dronext. Actively contributed to innovative projects, combining academic knowledge with practical applications. Skilled in team management, prototyping, and hands-on integration. Motivated by a passion for engineering, with a focus on creating intelligent, efficient, and impactful solutions in embedded systems.

EDUCATION

BE Electrical Engineering

SEECS , islamabad (2026)

INTERNSHIP EXPERIENCE

NCIL SEECS

20-Jun-2024 - 01-Sep-2024

PCB Design & Embedded Systems Design

MHTechFusion

01-Nov-2025 - 01-Jan-2026

Firmware engineer for embedded wearable medical and fitness devices

TowBotic Systems,Netherlands

25-Jun-2025 - 04-Sep-2025

Physics modeling, design and simulation for magnet arrays using comsol multiphysics.

Dronexas PvtLtd

01-Jun-2025 - 04-Sep-2025

Drone Design and control systems engineer

FINAL YEAR PROJECT

Ababeel - Intelliswarm

A Low cost, scalable, AI integrated VTOL Drone Swarm based on 3D printed body and ESPNOW based drone swarm network for tactical and rescue missions.

TECHNICAL EXPERTISE

Embedded Systems

I possess strong embedded systems experience in both Hardware and Firmware side, previously designing wearable medical tech for a German startup. Proficient in STM32, ESP32, AVR, 8051, and FreeRTOS, I also have experience in integrating machine learning and computer vision with Raspberry Pi for advanced surve ...

PCB Designing

My background features proven PCB design experience with leading platforms including Altium, KiCad, and EasyEDA, supported by

Fusion 360 skills for mechanical design.

Programming Languages

I have extensive experience working with C/C++, Python, Java, Matlab and Assembly.

Drone and UAV design

I have worked on VTOL and quadcopter UAVs as part of my FYP and have hands-on experience working with QGroundControl, Control Systems, Pixhawk flight controllers, 3D printed Structures, Motors/esc assembly and Raspberry PI based ML implementation on drones.

Machine Learning and Computer Vision

I have taken courses in Machine learning and classical computer vision techniques and have made distinguished projects by combining all these concepts with embedded edge ai devices.

Soldering and Circuit Assembly

I have about 7 years of hands-on experience in soldering and circuit making by working on many side projects for hobby.

Finite Element Analysis

I have gained about 3 months of experience in FEA and FEM using COMSOL Multiphysics by completing a remote internship with a company in Netherlands.

Arooj Fatima

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PROFESSIONAL PROFILE

Electrical Engineering graduate with hands-on experience in Python, C/C++, machine learning, and data analysis, seeking an industry role in advanced wireless and 6G technologies. My FYP focuses on deep reinforcement learning for 6G-enabled ISAC with Age of Information optimization, and I aim to apply ML, signal processing, and system modeling skills to real-world intelligent communication systems.

EDUCATION

BE Electrical Engineering

School of Electrical Engineering and Computer Science (SEECS) , 3.93 (2026)

INTERNSHIP EXPERIENCE

Information Processing and Transmission (IPT) Lab

01-Mar-2025 - 24-Jan-2026

• Conducting research aimed at tackling the evolving challenges in next-generation wireless networks. • Exploring and evaluating the feasibility of machine learning, particularly deep reinforcement learning, for optimizing future mobile networks. • Published research papers in IEEE IoT Journal and IEEE Wireless Communication Letters.

Adept TechSolutions

01-Jul-2025 - 31-Aug-2025

• Developed and tested AI-driven solutions for wireless communication applications. • Applied machine learning models to optimize system performance and enhance network efficiency. • Collaborated with cross-functional teams to integrate AI modules into practical communication workflows.

Descon EngineeringLimited,DESTDivision

01-Jul-2025 - 15-Aug-2025

Worked with the Engineering Management team to support planning, coordination, and performance analysis of engineering projects. Performed data analysis and reporting using Microsoft Excel, including data cleaning, trend analysis, and summary dashboards. Developed interactive Power BI dashboards to visualize project metrics, resource utilization, and progress tracking for decision support. Gained practical exposure to engineering workflows, data-driven management, and industrial project environments.

FINAL YEAR PROJECT

Age-Aware Deep Reinforcement Learning for Resource Allocation in 6G- Enabled IoT networks

The emergence of 6G networks is expected to revolutionize the Internet of Things (IoT) landscape by enabling ultra-reliable, low-latency, and intelligent connectivity for massive device deployments. As real-time IoT applications—such as industrial automation, autonomous systems, and remote monitoring—demand timely and energy-**effi**cient data delivery, conventional resource allocation strategies fall short in meeting the stringent performance requirements. In this work, we propose an intelligent, age-aware scheduling framework powered by deep reinforcement learning (DRL) to enhance the freshness of information and optimize resource allocation

in 6G- enabled IoT networks. Our approach integrates key enablers such as cognitive radio and non-orthogonal multiple access (CR- NOMA), along with realistic considerations like energy harvesting, queue dynamics, and interference constraints. By leveraging advanced DRL algorithms, we demonstrate significant improvements in system performance with respect to Age of Information (AoI), energy sustainability, and throughput. This research highlights the potential of AI-driven decision-making to unlock scalable, context- aware communication in future-generation IoT infrastructures.

TECHNICAL EXPERTISE

Technical Skills

Programming Languages: Python, C, C++, Embedded C, Assembly Language, MATLAB Machine Learning & Data Analysis: Scikit- learn, TensorFlow, Keras, Pandas, NumPy, OpenCV, Data Analysis & Visualization Wireless & Signal Processing: 6G Concepts, ISAC, Age of Information (AoI), Digital Signal Processing, Linea ...

Soft Skills

Technical&Creative Writing Analytical Thinking & Problem Solving Time Management & Organization Interpersonal Communication & Team Collaboration Emotional Intelligence Adaptability & Cognitive Flexibility Resilience & Continuous Learning

Manahil Ahmad

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PROFESSIONAL PROFILE

Electrical Engineering professional targeting roles in the **telecommunications and AI industry**, with strong expertise in **wireless communication systems (5G/6G), applied AI/ML ,and computer networking**. Core experience includes **AI-driven optimization of next-generation wireless networks**, co-authored an IEEE GLOBECOM 2025 **research paper** on Deep Reinforcement Learning–based phase shift optimization for stacked intelligent metasurfaces (SIM) in Integrated Sensing and Communication (ISAC) systems. Expert in **MachineLearningandDeep Learning**, including SupervisedLearning,**Reinforcement Learning(RL/DRL), Convolutional andRecurrent NeuralNetworks, Transformers, andVision Transformers(ViT)**.Hands-on experience with **Computer Vision, Image Processing, Object Detection (YOLOv8/YOLOS), edge AI deployment, and CUDA programming** forGPU acceleration.Possessasolid foundationin **computer networks (TCP/IP,SDN, Mininet,virtualization, Linux networking)** and wireless system modeling in Python and MATLAB, alongside strong skills in signal processing and communication system analysis.

This technical expertise is complemented by **proven leadership, project management, and community engagement experience**, gained as a **UNAI Millennium Fellow** and **Electrical Team Executive at Formula Student NUST**. Through coordinating multidisciplinary teams, managing complex projects, and leading social-impact initiatives, I have developed strong **teamwork, communication, and cross-functional collaboration skills**, enabling effective contribution to both technical and mission-driven projects in telecom and AI domains.

CV Link: https://drive.google.com/file/d/16NaEEtoCYbPSc12toKZuOtUgqYiPOqm4/view?usp=sharing

GitHub Link: manahild (Manahil Ahmad)

Linkedin: Manahil Ahmad | LinkedIn

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3.16 (2026)

INTERNSHIP EXPERIENCE

IPT Lab, SEECS, NUST — FYP Intern

17-Apr-2025 - 24-Jan-2026

Conducting research on Stacked Intelligent Metasurfaces (SIM) and Deep Reinforcement Learning (DRL) for next-generation wireless networks (6G), focusing on enhancing data rates, spectrum efficiency, and reliability. Developing a SIM-enabled Integrated Sensing and Communication (ISAC) system model to jointly optimize phase shifts for both communication and sensing functionalities, improving throughput and latency performance in ultra-dense networks. Modeling complex wireless channels and designing learning-based optimization policies to evaluate system-level metrics, including data rate maximization, signal-to-noise ratio, and reliability under realistic propagation conditions. Co-authored IEEE GLOBECOM 2025 paper: “DRL-based Phase Shift Optimization for SIM-enabled Wireless Systems”, demonstrating research impact on 6G system design and optimization. Tools/Skills: Python, PyTorch, MATLAB, Wireless System Modeling, Signal Processing, DRL, ISAC, Simulation.

Deep LearningLab,SINES—MachineLearningIntern

03-Jun-2024 - 12-Sep-2024

Completed specializations in Machine Learning, Deep Learning, Image Processing, and Computer Vision. Implemented various deep learning architectures in CUDA and Python, performing forward propagation for MNIST classification with Multilayer Perceptron (MLP) and verifying results in Keras. Optimized GPU computations using CUDA programming, achieving faster model training and

inference. Tools/Skills: Python, CUDA, PyTorch, Keras, Deep Learning, GPU Acceleration, Image Processing. Certificate:https://drive.google.com/file/d/1-wgvw7zO5cLq_6zO8dclqCib4k07IBBS/view?usp=sharing Github:https://github.com/manahild/MNIST-CLASSIFCATION-VIA-MLP-IN-CUDA

Smart AgritechLab,SINES—DeepLearningandComputerVisionIntern

18-Jul-2024 - 12-Sep-2024

Developed a computer vision system to identify Holstein Friesian cattle by coat patterns. Managed end-to-end ML pipeline: data collection, annotation with LabelMe, data augmentation, and model training. Trained YOLOv8 on a custom dataset, achieving high accuracy in cattle identification, enabling automated livestock monitoring. Tools/Skills: Python, YOLOv8, Computer Vision, Image Processing, Deep Learning, LabelMe. Certificate: https://drive.google.com/file/d/15VWnxKa1aFzKbd1zQs8OBLOBrFvT48mB/view?usp=sharing Github:https://github.com/manahild/Yolov8_for_Cattle_Identification_via_Coat_Pattern-

Team Alif–FormulaStudentNUST—ElectricalTeamMember

19-Oct-2023 - 12-Jun-2024

Contributed to the design and development of an electric racing car, applying electrical engineering principles for vehicle power systems. Analyzed and optimized battery performance, designed wiring layouts, and supported integration of sensors and controllers for reliable system operation. Coordinated with multidisciplinary teams to ensure timely project execution and alignment with competition standards. Tools/Skills: MATLAB, Electrical Design, Battery Optimization, Embedded Systems, Team Coordination.

Millennium CampusNetwork(PartneredwithUNAI)—MillenniumFellow

21-Aug-2024 - 01-Jan-2025

Led the “Restoring Schools, Inspiring Minds” project aligned with UN SDG-4, providing educational support to underprivileged students. Coordinated community outreach, awareness sessions, and educational activities, improving access to learning resources. Developed project management, leadership, and team coordination skills while achieving measurable social impact. Skills: Leadership, Project Management, Community Engagement, Strategic Planning. Certificate: https://drive.google.com/file/d/16PUO0OuN87GRfzuqGkuhv1rlV0hFGaWz/view?usp=sharing Links: https://www.millenniumfellows.org/fellow/2024/nust-pk/manahil-ahmad

FINAL YEAR PROJECT

"Intelligent Control of Stacked Intelligent Metasurfaces-Assisted Wireless Networks using Deep Reinforcement Learning"

Designed and implemented a SIM-enabled Integrated Sensing and Communication (ISAC) system model, enabling simultaneous communication and sensing within a unified wireless framework for 5G/6G next-generation networks. Formulated point-target and extended-target sensing performance optimization using Cramér–Rao Bound (CRB) alongside communication throughput, balancing high data rates with reliable connectivity in dense network scenarios. Developed a Deep Reinforcement Learning (DRL) optimization framework to learn optimal phase shift configurations of stacked intelligent metasurfaces, improving signal quality, spectral e**ffi**ciency, and network reliability under realistic power, noise, and channel constraints. Modeled complex wireless propagation environments, simulating both communication and sensing channels, to evaluate trade-o**ff**s between sensing accuracy and communication performance critical for 5G/6G deployment. Implemented and trained DRL agents in Python and PyTorch, focusing on reward design, policy learning, and convergence behavior for real-world ISAC optimization. Conducted extensive system-level simulations to analyze throughput, latency, reliability, and sensing accuracy across multiple network configurations. Research outcomes contributed to a peer-reviewed publication accepted at IEEE GLOBECOM 2025, titled: “DRL-Based Phase Shift Optimization for SIM-Enabled Wireless Systems”, demonstrating applicability to telecom industry challenges such as enhancing data rates, coverage, and reliability in next-generation networks.

TECHNICAL EXPERTISE

Artificial Intelligence, Machine Learning & Deep Learning

Complete Coursera Specialization in Reinforcement Learning & Deep Reinforcement Learning Strong command of Machine Learning and Deep Learning theory and practice Supervised Learning, Deep Neural Networks, CNNs, RNNs, Transformers Model training, evaluation, hyperparameter tuning, and performance opti ...

Computer Vision & Image Processing

Classical Computer Vision: filtering, edge detection, feature extraction Deep Learning–based Vision: CNNs, Vision Transformers (ViT) Object Detection, Image Classification, Custom Dataset Training Tools & Models: OpenCV, YOLOv8, YOLOS Image processing in Python and MATLAB

Wireless Communication & Signal Processing
Wirelesssystem modeling andsimulationinPythonandMATLAB Channel modeling, performance evaluation, and system-level analysis Signal processing concepts applied to communication and sensing systems Image and signal processing using MATLAB and Python

Computer Networks & Distributed Systems
Strongfoundationin TCP/IPnetworkingLinux-basednetworking and system configuration Software-Defined Networking (SDN) concepts and experimentation Network simulation using Mininet Virtual Machines (VMs), containerization (Docker), and Kubernetes orchestration Exposure to scalable, software-d ...

Edge AI & Embedded Systems
NVIDIAJetson Nanofor EdgeAIdeployment Embedded systems development using Arduino and ESP8266 Hardware–software integration and system interfacing Edge deployment of AI and vision models

Data Science, Analytics & Visualization
Data preprocessing,featureengineering,andexploratory data analysis Libraries: NumPy, Pandas, Matplotlib, Seaborn Data analysis and visualization using RapidMiner and Tableau

Programming & Technical Computing
Python, C++, C,EmbeddedC,SQLScientificcomputing and simulation-based development Performance-oriented programming for ML and signal processing workloads

Developer, Research & Productivity Tools
Git / GitHub,LinuxVSCode,JupyterNotebook,GoogleColab Reproducible experimentation and collaborative research workflows

AI/ML Acceleration & Experimentation Tools
CUDAProgrammingforGPUaccelerationDatasetannotation and management: LabelMe, Roboflow Training monitoring and debugging: TensorBoard

Asiya Ali Khan

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PROFESSIONAL PROFILE

Electrical Engineer with a strong interest in next-generation communication systems, intelligent networking, and machine learning–driven optimization. Experienced in SDN-based architectures and system-level simulations, with hands-on exposure to Linux environments and modern software development. Motivated by solving complex engineering problems and contributing to emerging technologies such as 6G networks.

EDUCATION

Bachelors in Electrical Engineering

SEECS , Islamabad , 2.44 (2026)

Bachelors in Electrical Engineering

SEECS , Islamabad , 2.44 (2026)

INTERNSHIP EXPERIENCE

VisionX

05-Jun-2024 - 05-Aug-2024

Machine Learning Intern, worked on CNN for tooth segmentation and YOLO v8 for detection and also GEN AI for AI influencer

FINAL YEAR PROJECT

Towards 6G: SDN based intelligent integrated communication networks

This project focuses on designing and evaluating an intelligent communication network architecture for future 6G systems using Software Defined Networking (SDN). By decoupling the control and data planes, SDN enables centralized, flexible, and programmable network management. The proposed system integrates machine learning–based intelligence to optimize routing, resource allocation, and network performance in dynamic environments. Through simulation-based analysis, the project demonstrates how SDN-driven intelligence can enhance latency, throughput, scalability, and reliability, paving the way for e**ffi**cient and adaptive 6G integrated communication networks.

TECHNICAL EXPERTISE

Haida Asif

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PROFESSIONAL PROFILE

Haida Asif is a detail-oriented Electrical Engineering student at the National University of Sciences and Technology (NUST), Islamabad, expected to graduate in 2026, with a strong academic foundation in embedded systems, circuit design, signal processing, and software–hardware integration, and a focused specialization in Computer Vision and Machine Learning. She has extensive project-based experience designing and implementing systems using microcontrollers, sensors, and embedded software, working independently and in team-based academic settings with strong collaboration and troubleshooting skills. Her project portfolio spans automation, control systems, robotics, and assistive technologies, including automatic street lights using solar panels, fingerprint- based door lock systems, automatic fan speed controllers, smart sticks for the visually impaired, automatic sun-following solar panels, human-following robots, and digital even/odd bit parity generators, alongside advanced ML/CV projects such as a voice-based emotion detection model, a driver fatigue detection system (awarded Best Simulation), and a real-time Pakistani Sign Language interpreter as her Final Year Design Project, enabling two-way translation between sign language, text, and audio. She has completed rigorous coursework in Circuit and Network Analysis, Microprocessors, Electronics I & II, Digital Logic, Control Systems, Digital Signal Processing, and Computer Communication Systems, and further strengthened her expertise through internationally recognized certifications in ML and CV from Harvard (edX), Columbia and Stanford (Coursera). Complementing her technical profile, she has held leadership and management roles in university societies, reflecting strong organizational ability, adaptability, and a strong commitment to continuous learning and impactful, real-world engineering solutions.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 2.22 (4)

INTERNSHIP EXPERIENCE

ONT LabSEECS

16-Jun-2025 - 16-Sep-2025

Completed a 3-month internship at the ONT Lab, SEECS, where I designed and implemented an optical transceiver based on DQPSK modulation, incorporating bit scrambling and key-based encryption/decryption to secure optical communication and mitigate eavesdropping.

FINAL YEAR PROJECT

SignLink

SignLink is an AI-powered mobile application that translates sign language gestures into spoken words in real time. It uses computer vision and a trained LSTM model to recognize hand movements and convert them into meaningful phrases. Designed to bridge the communication gap for the deaf and hard-of-hearing community, SignLink enables seamless interaction between sign language users and non-signers.

TECHNICAL EXPERTISE

Computer Vision, Machine Learning & Robotics

Strong technical expertise in Computer Vision and Machine Learning with hands-on experience in developing real-world intelligent and robotic systems. Built multiple ML- and CV-based projects including a voice-based emotion detection model, a driver fatigue detection system using computer vision and machine le ...

Ahmed Hussain

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at NUST with a strong passion for AI, ML, computer vision, robotics, and embedded systems. Experienced in end-to-end development of intelligent systems, including a swarm drone project featuring real-time object detection deployed on Raspberry Pi and STM32 platforms. Skilled in integrating deep learning models with hardware for autonomous navigation, target detection, and swarm coordination. Driven to solve complex problems, collaborate effectively, and contribute to innovative AI/ML and robotics solutions.

EDUCATION

Bachelor of Electrical Engineering

SEECS , Islamabad,Capital,Pakistan , 2.65 (4)

INTERNSHIP EXPERIENCE

SEECS C ontrolLab

06-Jun-2023 - 02-Sep-2023

Completed an internship focused on IoT and Cloud-based systems, with hands-on experience using Arduino and ESP32 microcontrollers for programming and interfacing with real-world systems. Designed and implemented sensor-based embedded applications to collect real-time data and transmit it to cloud platforms for monitoring and analysis. Worked extensively with ESP32 for Wi-Fi–enabled IoT applications, device communication, and real-time control. Utilized MATLAB for data analysis, simulation, and system modeling. Gained practical exposure to IoT architecture, embedded system design, cloud integration, and debugging of hardware–software systems.

CodeAlpha

01-Jun-2024 - 02-Jul-2023

Worked as a Machine Learning and Python Intern at Code Alpha, where I developed and implemented machine learning models using Python. Contributed to a Price Prediction project by performing data preprocessing, feature selection, model training, and evaluation. Designed and implemented deep learning models using LSTM and GRU to predict next-day temperature and humidity based on historical time-series data. Gained hands-on experience in data analysis, model optimization, and performance evaluation using Python libraries such as NumPy, Pandas, Scikit-learn, and TensorFlow/Keras.

Dronext

11-Jun-2025 - 10-Sep-2025

Worked as part of a team at Dronext on the design and development of smart VTOL UAVs. Contributed to intelligent drone swarming integration using embedded systems and communication protocols. Gained hands-on experience with Pixhawk flight controllers, including configuration, calibration, and flight testing. Involved in 3D printing of UAV components, system assembly, and integration of telemetry equipment for real-time data transmission and monitoring. Developed practical skills in UAV design, embedded systems, and autonomous flight technologies.

YouthEntrepreneurialSociety - NUSTSEECS

11-Jan-2023 - 15-Jan-2025

Served as an HR member for one year during academic studies at NUST SEECS, contributing to member recruitment, coordination, and internal team management. In the following year, worked as an Admin & Events team member, actively involved in planning, organizing, and managing entrepreneurial seminars and events at SEECS and NUST. Assisted in coordinating speakers, logistics, and event execution, gaining experience in leadership, teamwork, and event management within a student-led professional society.

FINAL YEAR PROJECT

warm Intelligent Drone

Theproject involvesdesigninga swarm-intelligent drone system with one Mother VTOL UAV and two Child quadcopters operating in a coordinated network. The Mother drone serves as the central intelligence unit, performing area surveillance, autonomous navigation, and real-time object detection using deep learning-based computer vision. Upon detecting a target, the Mother drone calculates its GPS coordinates and transmits them to the Child drones via a wireless swarm network. The Child drones autonomously navigate to the target, with swarm algorithms ensuring formation control, collision avoidance, and synchronized task execution. The system integrates embedded systems, flight controllers, telemetry, onboard computing, and inter-drone communication, combining swarm intelligence, computer vision, and deep learning. Applications include surveillance, defense, and autonomous multi-UAV missions

TECHNICAL EXPERTISE

AI/ML

•Programming: Python, C, C++, OOP • Version Control: git ,github • Tools: VS Code, Jupyter Notebook, Google Colab, Kaggle • Libraries & Frameworks: NumPy, Pandas, scikit-learn, TensorFlow, Matplotlib, Seaborn , OpenCV, FastApi • Machine Learning: Regression, Classification, Random Forest, Neural Network ...

Electrrical

Sofwares:Pspice, Ltspice, Atmel Studion, Code Composer, Altium Design, QGC, Mission Planner

Naeem Ullah

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PROFESSIONAL PROFILE

A passionate Electrical Engineering student at NUST with strong foundations in embedded systems, digital design, and advanced communication systems. Experienced in hands-on hardware development, IC design fundamentals, and practical engineering projects. Known for problem-solving, teamwork, and the ability to learn and apply complex technical concepts quickly.

EDUCATION

Science
GHS Model High School Bhakkar , Bhakkar , 1057/1100 (2020)
Pre-Engineering
Punjab Group of Colleges (PGC) Bhakkar , Bhakkar , 1061/1100 (2022)
BS Electrical Engineering
SEECS, NUST , Islamabad , 3.78/4 (2026)

INTERNSHIP EXPERIENCE

Nust ChipDesignCentre(NCDC)
05-Feb-2025 - 18-Jul-2025

Completed hands-on labs in C programming, Digital Logic Design, RISCV assembly, and Computer Architecture. Designed and implemented a fully functional 5-stage pipelined RISCV processor in SystemVerilog, handling data, control, and structural hazards. Developed a branch predictor module to improve processor performance and reduce control hazards. Gained experience with industryrelevant IC design workflows, including design, simulation, and verification of digital systems.

System onChip(SoC)Lab,SINES,NUST
18-Jul-2024 - 06-Sep-2024

Worked on processor design using Verilog/SystemVerilog. Performed RTL coding, simulations, and hardware testing. Successfully implemented a digital design project demonstrating advanced logic and architecture concepts.

MicroandNanoElectronics(MiNE)Lab,RIMMS , NUST
05-Jun-2024 - 28-Aug-2024

Designed and developed PCB-proven electronic systems with emphasis on layout optimization and SMD techniques. Strengthened practical knowledge of micro- and nano-electronics through real-world laboratory applications. Gained hands-on experience in hardware debugging and validation.

FINAL YEAR PROJECT

5G Performance Optimization

Completed timing profiling of the 5G physical (PHY) layer to identify latency-critical processing blocks. Shifted selected time-critical PHY functions from the Processing System (PS) to the Programmable Logic (PL). Working on real-time deployment of 5G New Radio (NR) on an SDR platform using OpenAirInterface (OAI) 5g NR. Targeting improvement in system throughput and reduction in end-to-end latency.

TECHNICAL EXPERTISE

Programming Languages
C,C++,Python,Assembly(RISC-V), Object-Oriented Programming (OOP)

Hardware Description Languages
Verilog,SystemVerilog,RTLdesign,simulation, and verification basics

Embedded & RTOS Systems
RTOSconcepts,taskscheduling,inter-process communication, embedded system development

Engineering Tools
Linux(Ubuntu),GDBdebugging, MATLAB, simulation and development tools, Vivado

Hizbullah Khan

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PROFESSIONAL PROFILE

> *I am an Electrical Engineer with a strong foundation in electrical circuits, power electronics, machines, and control systems. Skilled in problem analysis, circuit design, and practical troubleshooting through laboratory and project experience. Highly motivated to apply technical knowledge in real-world engineering environments and grow as a professional engineer.*

EDUCATION

Electrical

Hizbullah Khan , islamabad , 3.02 (2026)

INTERNSHIP EXPERIENCE

StrategicInnovativeEngineering (Private) Limited

27-Jun-2025 - 27-Aug-2025

power system and renewable energy

PCBDesigningatNUSTConventry Internet of Things Lab

24-Jun-2024 - 27-Aug-2024

printed circuit board (PCB) design

FINAL YEAR PROJECT

SMART ROAD WITH WIRELESS POWER TRANSFER CAPABILITIES FOR EVs

This project focuses on the design and development of a smart road system that can wirelessly transfer electrical power to Electric Vehicles (EVs) while they are moving or stopped on the road. The main objective is to reduce the dependency on conventional charging stations and increase the driving range of EVs. The system uses wireless power transfer (WPT) technology based on electromagnetic induction or resonant coupling. Transmitter coils are embedded beneath the road surface, while receiver coils are installed under the EV. When an EV passes over the smart road, power is transferred wirelessly to charge the vehicle's battery. The road is integrated with sensors and a control unit to detect the presence of EVs and activate power transfer only when required, improving energy e**ffi**ciency and safety. A renewable energy source (such as solar panels) can also be integrated to make the system more sustainable. This project aims to promote green transportation, reduce charging time, and support the future development of intelligent transportation systems.

TECHNICAL EXPERTISE

Electrical Engineer | Power Systems & Electronics Specialist

Proficient in the analysis, modeling, and operation of electrical machines, including transformers, DC motors, and induction motors. Skilled in power electronics, including rectifiers, inverters, and converters, with a solid understanding of AC and DC circuit analysis. Knowledgeable in power system fundamenta ...

Ahmad Hussain

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PROFESSIONAL PROFILE

Final-year **Electrical Engineering** undergraduate at the **National University of Sciences and Technology (NUST),** Pakistan,

withstrongspecializationin**FPGA-baseddigital system design, embedded systems**,and **AI-enabledhardwaresolutions.** Demonstrated experience in Verilog HDL development, SoC-based system implementation, and applied **machine learning** for real-world engineering problems, including medical imaging and **precision agriculture**. Actively engaged in research-driven innovation, with a focus on low-latency, **energy-efficient intelligent systems** that bridge hardware acceleration and data-driven intelligence.

EDUCATION

Matriculation
Jauhar Model High school , Mianwali , 1038 / 1100 (2020)

Intermediate
GAES Model College for boys , Mianwali , 1023 / 1100 (2022)

Bachelor of Electrical Engineering
National University of Sciences and Technology (NUST) , Islamabad , 3.01/4 (2026)

INTERNSHIP EXPERIENCE

NUST Chip Design Centre (NCDC), Islamabad

17-Jun-2024 - 15-Aug-2024

Worked on FPGA-based digital system design using Verilog HDL on DE1-SoC platforms, covering RTL design, simulation, and on-board implementation. Designed and implemented advanced digital systems, improving testing e**ffi**ciency by 15% through optimized verification workflows. Enhanced overall design reliability and reduced project turnaround time by 20% via structured modular design and iterative refinement. Gained hands-on experience in digital system design, FPGA SoC architectures, and low-level hardware implementation using Intel Quartus Prime and assembly-level concepts.

MachVis Lab(SEECS),NUST

05-Aug-2025 - 25-Jan-2026

Designed embedded firmware for FPGA-accelerated convolutional neural networks (CNNs) in medical imaging pipelines. Optimizing inference latency by 16–22% while maintaining classification accuracy across medical datasets. Contributing to accessible, sustainable healthcare technologies aligned with digital innovation initiatives

FINAL YEAR PROJECT

Drone-Assisted Crop Disease Detection, Phenotyping, and Smart Spraying

Developing a UAV + IoT system with Jetson Nano–based edge computing for real-time disease detection, phenotyping, and precision spraying using aerial (RGB, NDVI, thermal) and sensor data. Integrating autonomous spraying to reduce pesticide usage and improve yield e**ffi**ciency, enabling a scalable precision agriculture tool for sustainable farming. Contributes to AI for sustainable agriculture and precision-farming innovation.

TECHNICAL EXPERTISE

Embedded Systems & IoT

Embedded C, FreeRTOS, I2C, UART, SPI, Embedded Linux, Bootloaders, Linux Kernel Configuration, GPIO and Peripheral Interfacing, STM32, ESP32, Arduino, ATmega Microcontrollers, Jetson Orin Nano

Machine Learning

Supervised&Unsupervised Learning , Linear & Logistic Regression , Decision Trees & SVM , K-Nearest Neighbors , Clustering & Anomaly Detection , Dimensionality Reduction (PCA) , Feature Extraction , Neural Network Training , Data Scraping and Data cleaning.

RTL and FPGA Design

RTL Design,Verilog,SystemVerilog, FPGA Architecture, Computer Architecture, Digital System Design, Hardware Verification, DE1 SoC, AXI Interface

Deep Learning

TensorFlow , Keras , PyTorch , Scikit-learn , NumPy & Pandas , Matplotlib , ANNs , CNNs , RNNs & LSTMs , Generative Models , GANs , Autoencoders , Transformers & LLMs.

Programming Languages

C/C++ , EmbeddedC , Python , Verilog HDL , SystemVerilog , Assembly , MATLAB & Simulink, HTML 5

Development Platforms & Tools

XilinxVivado,VivadoHLS, IntelQuartus, ModelSim, IAR Workbench, STM32Cube IDE, Arduino IDE, Atmel Studio, VS Code, Jupyter Notebook, Google Colab, Kaggle. MATLAB, Simulink, LabView, Proteus, PSpice, Power BI, Tableau, Git/GitHub, RealVNC, FileZilla.

Wahhaj Waheed

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PROFESSIONAL PROFILE

Proactive Electrical & Embedded Systems engineer with practical industry exposure at Chashma Nuclear Power Plant and hands-on embedded projects (ESP32, PID control, flight controllers). Strong background in control systems, hardware prototyping, and firmware development, complemented by leadership experience in business development and project delivery. Fast learner who bridges hardware/software integration to produce reliable, production-ready systems.

EDUCATION

BEE

SEECS , Islamabad , 3.78 (2026)

INTERNSHIP EXPERIENCE

CHASHNUPP

06-Jun-2024 - 09-Jan-2024

• Observed and assisted in reactor operations and refueling workflows; gained practical insight into power-generation systems and industrial instrumentation. • Supported the Simulator Division by working with digital I/O and control-room simulation tools (EPICS workflows).

DroNext Pvt.Ltd

06-Jan-2025 - 09-Jan-2025

• Contributed to R&D for tethered drone systems (24/7 surveillance configuration); participated in flight-controller, ESC, and mechanical design (3D printing & CAD). • Helped present the tethered system in a national demonstration (14 August event).

FINAL YEAR PROJECT

Parwaaz: A Courier Drone Delivery System

TECHNICAL EXPERTISE

Electrical Engineer

• Embedded Systems & Microcontrollers: ESP32 (extensive), familiar with STM32 • Control Systems: PID tuning, real-time loop control, Kalman filtering, sensor fusion. • Firmware & Languages: C, C++, Arduino, basic Python, Git version control. • Hardware & PCB: PCB prototyping & etching, soldering, sens ...

Muhammad Umair

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PROFESSIONAL PROFILE

Electrical Engineering graduate seeking a Graduate Trainee Engineer role in plant operations, and project-based environments, with strong interests in power systems, control systems, and test & measurement.

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 3.72 (4)

INTERNSHIP EXPERIENCE

Power andSmartGridlab,USPCAS-E,NUST-H12

03-Jun-2024 - 19-Jul-2024

• Conducted research on grid-tied inverters and MPPT controllers • Performed hardware testing of environmental testing machine • Validated theoretical concepts through hands-on experiments (voltage divider, relays, transistors, Arduino UNO, Transistor) • Learned MATLAB and Simulink • Assisted Lab-engineer in day-to-day tasks

WAPDA Engineering Acedemy, Faislabad

22-Jul-2024 - 16-Aug-2024

• Received training about power transmission & distribution systems • Studied single line diagrams. • Studied operations of key power grid components (circuit breaker, transformer, control panel). • Studied cables (overhead and underground), their joining, and insulation testing. • Conducted tests on power transformers,instrument transformers (PT and CT), breakers, and other power equipment • Studied and performed normal grid operation (load shifting from 1 bus bar to other, testing of substation battery parameters). • Synchronization of generator with grid.

OGDCL, Chanda Oil and Gas Field

03-Jun-2025 - 30-Jun-2025

• Studied instrumentation systems used for process variable measurement in oil and gas operations. • Gained exposure to PID-based industrial control systems for process regulation. • Reviewed P&ID and PFD diagrams. • Observed generator control panel and synchronization panel. • Observed motor control room with Direct-On-Line (DOL) starting mechanisms along with associated protection and control circuitry. • Participated in the routine control room operations.

Research InstrumentsandMeasurementSystems(Pvt)Ltd

01-Jul-2025 - 29-Aug-2025

Recognized with the Best Intern Award • Worked on LabVIEW and NI-based projects. • Worked on industrial projects • Gained hands-on experience in instrumentation, sensors, sensor communication and DAQ system • Worked on different devices including MISOL Weather monitoring station, XY-MD02 temperature and humidity sensor, panel AC, STM32 (F407VGT6) and environment control cabin, 4-quadrant power supply.

FINAL YEAR PROJECT

Smart PLC-Based Multi-Source Power Management System with Cost Optimization and Maintenance-Aware Switching

This project implements a PLC-based power management system that integrates WAPDA grid, Generator 1, Generator 2, and UPS to provide uninterrupted power. When WAPDA fails, the UPS immediately supplies critical loads while the PLC monitors battery voltage, UPS parameters, load demand, and generator fuel levels to select the most suitable generator. If fuel or capacity is limited,

non-critical loads are shed to protect critical supply. When the grid (WAPDA) is available and system conditions are normal, the controller performs cost-based source selection by comparing the cost per kWh of WAPDA with the operational cost of running the generators. If a generator is more economical, the system switches to it automatically, reducing operational expenses while ensuring continuous power delivery. Dedicated maintenance lines for WAPDA and both generators allow uninterrupted operation even during UPS maintenance or breakdown. Integrated protection relays o**ff**er overcurrent and overvoltage protection, isolating faulty sources or initiating safe shutdown procedures. A user-friendly HMI interface provides real-time status of sources, loads, fuel levels, and alarms, allowing operators to monitor and control the system effectively.

TECHNICAL EXPERTISE

Programming Tools

C/C++, Python, MATLAB, Simulink, PSpice,LabVIEW, NI, PCB Design (basic), Mendeley, TIA Portal

Microcontrollers

Arduino UNO, ESP32, STM32

Hardware Skills

Circuit implementation and testing, hardware patching on breadboard and veroboard, soldering, sensor integration, microcontroller interfacing, and hardware troubleshooting

Ibraheem Hasnain

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PROFESSIONAL PROFILE

Electrical Engineering student specializing in embedded systems and digital design, with a strong foundation in microcontrollers, digital logic, and hardware–software integration. Motivated to apply theoretical knowledge to practical projects, enhance technical skills, and contribute to innovative engineering solutions.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3 (2026)

INTERNSHIP EXPERIENCE

Korea EHT

20-Jul-2024 - 18-Sep-2024

Performed electric heat tracing calculations and classified heat tracing cables for different industrial operating scenarios.

NovaTechX

01-Jul-2025 - 31-Aug-2025

Designed and modeled a medical device system using Cameo Systems Modeler and prepared a comprehensive Request for Proposal (RFP).

Pakistan Railways

18-Aug-2025 - 01-Sep-2025

Gained hands-on exposure to railway powerhouses and manufacturing workshops while analyzing and documenting vehicle component production processes.

FINAL YEAR PROJECT

Embedded Design For Nanometric Vibration Measurement By Laser Sensing

Designing an FPGA-based embedded system for nanometric vibration measurement using laser sensing, implementing the SC-TFSP algorithm with real-time signal processing using Xilinx Vivado.

TECHNICAL EXPERTISE

RTL Design and Simulation

Experienced in RTL design, synthesizable hardware development, and functional verification using Xilinx Vivado.

Microcontroller-based System Design

Skilled in embedded system design using Embedded C and FreeRTOS on ESP32, Arduino, and STM32, with experience in hardware–software integration and real-time task management.

Signal Processing & Analysis Tools

Experienced in signal analysis, algorithm modeling, and data visualization for time- and frequency-domain signal processing and pre-hardware validation.

Muhammad Sufyan Haider

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PROFESSIONAL PROFILE

An accomplished Electrical Engineering student with a top-ranking academic record and hands-on experience in developing and optimizing next-generation telecom systems. Skilled in implementing cutting-edge solutions for 5G/6G networks, IoT, and wireless communication systems, with a strong focus on practical, real-world applications. Experienced in using deep reinforcement learning (DRL) to enhance network efficiency, optimize resource allocation, and improve security in dynamic communication environments. Proficient in Python, C/C++, and MATLAB for building and deploying scalable solutions that improve network performance, throughput, and reliability. Adept at using simulation tools to model and analyze network architectures, ensuring seamless integration
of new technologies like AI-driven optimization and CR-NOMA. Proven track record in collaborating on large-scale, NATO-funded projects and developing high-impact solutions for real-world telecom challenges. Ready to bring technical expertise and innovative solutions to accelerate the success of telecom networks.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3.94 (2026)

INTERNSHIP EXPERIENCE

SHAILLA Research Project

16-Aug-2025 - 16-Dec-2025

Engaged in a three-year NATO-funded collaboration between Gebze Technnical University, Istanbul Medipol University, Polytechnique Montreal and NUST. • Investigating vulnerabilities of HAPS links to eavesdropping and other physical-layer security threats. • Developing adaptive attack models and AI/ML-based countermeasures for enhancing secrecy performance.

Information processing and Transmission Lab

15-Mar-2025 - 19-Jan-2026

Pioneering novel network architectures and analyzing their performance using simulations and analytical techniques. • Conducting research aimed at tackling the evolving challenges in next-generation wireless networks. • Exploring and evaluating the feasibility of machine learning, particularly deep reinforcement learning, for optimizing future mobile networks.

Optical NetworksandTransmissionLab

01-Jun-2025 - 30-Aug-2025

Investigated the O-RAN architecture to understand network design for next-generation wireless systems. • Developed synthetic RF datasets for training RAN Intelligent Controllers (RICs) using GANs. • Enhanced training data diversity, improving robustness of AI-driven RAN optimization tasks.

Digital EmpowermentNetwork

01-Jul-2024 - 01-Oct-2024

Built ML models to accurately predict customer purchasing behavior and improve sales forecasting. • Analyzed customer segmentation datasets to effectively uncover trends and support data-driven decisions. • Developed a targeted marketing strategy using insights from data analysis to significantly boost customer engagement.

FINAL YEAR PROJECT

Age aware deep reinforcement learning for Resource allocation in 6G enabled IoT Networks

The emergence of 6G networks is expected to revolutionize the Internet of Things (IoT) landscape by enabling ultra-reliable, low-

latency, and intelligent connectivity for massive device deployments. As real-time IoT applications such as industrial automation, autonomous systems, and remote monitoring demand timely and energy-efficient data delivery, conventional resource allocation strategies fall short in meeting the stringent performance requirements. In this work, we propose an intelligent, age-aware scheduling framework powered by deep reinforcement learning (DRL) to enhance the freshness of information and optimize resource allocation in 6Genabled IoT networks. Our approach integrates key enablers such as cognitive radio and non-orthogonal multiple access (CR-NOMA), along with realistic considerations like energy harvesting, queue dynamics, and interference constraints. By leveraging advanced DRL algorithms, we demonstrate significant improvements in system performance with respect to Age of Information (AoI), energy sustainability, and throughput. This research highlights the potential of AI-driven decision-making to unlock scalable, context- aware communication in future-generation IoT infrastructures.

TECHNICAL EXPERTISE

Languages

Python, C/C++, Java, MATLAB, Verilog, LATEX

APIs and Libraries

Pandas, Numpy, Scikit-learn, Pytorch, Tensorflow, OpenCV, Ultralytics

Design and Simulation Tools

Design and Simulation Tools: ModelSim, Proteus, LTspice, MATLAB/Simulink, LabView

Muhammad Attique

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PROFESSIONAL PROFILE

Enthusiastic Electrical Engineering student specializing in power systems, smart grids, renewable energy integration, and control systems. Experienced with power quality analysis, embedded microcontrollers (Arduino, ESP32), and energy monitoring systems. Passionate about automation, IoT-based grid modernization, and sustainable energy technologies.

EDUCATION

Bachelor in Electrical Engineering

School of Electrical engineering and Computer Science (SEECS) , Islamabad , 2.67 (2022)

INTERNSHIP EXPERIENCE

Smart GridandPoweLab,USPCASE-NUST

03-Jun-2024 - 19-Jul-2024

Researched EIS and machine learning for Li-ion battery diagnostics, BMS, SOH/SOC estimation, and fault detection. Analyzed EIS data using ML models and gained hands-on experience with Power Quality Analyzers. Developed skills in technical analysis, scientific reporting, and research documentation.

WAPDA Engineering Academy, Faisalabad

22-Jul-2024 - 16-Aug-2024

Gained hands-on experience in power transmission, distribution, and grid operations at a 132 kV Grid Station and RT & SC Lab. Observed transformer testing and maintenance at FECSO, learning safety protocols and standard engineering practices.

FINAL YEAR PROJECT

Cloud-Connected ML Telemetry Retrofit Device for Solar Inverters

Designed a plug-and-play retrofit for legacy solar inverters adding real-time monitoring and ML-driven alerts to detect faults, optimize battery use, and extend inverter lifespan, reducing e-waste and ownership costs.

TECHNICAL EXPERTISE

Software & Simulation

MATLAB/Simulink, PSpice, LABView, Arduino IDE, PCB Design

Hardware & Tools

Arduino, ESP32, Power Analyzers, Controlers

Other Tools

MS Word, Canva, Figma

Soft Skills

Project Management, Decision Making, UI/UX Design, Communication

Aleesha Waqar

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PROFESSIONAL PROFILE

Please update objective section.

EDUCATION

BE Electrical Engineering

SEECS , Islamabad , 3.05/4 (2026)

INTERNSHIP EXPERIENCE

Dawlance

22-Jul-2024 - 31-Aug-2024

Prototyped and deployed two projects ”IoT-Driven VFD Control” and ”Data logger with SD card module and REST APIs” at Dawlance DPL-1 building 7. Data logger with SD card module and REST APIs: Records changes in ambient temperature, humidity, air quality, and heat index via sensors at regular intervals using ESP 8266, RTC module and store them on SD card and REST API interface opens the door to monitoring and management of our data logger remotely IoT-Driven VFD Control Framework: An IoT-based control that enables remote monitoring and management of VFD via Modbus Communication HTTP protocol, with the ability to read and set parameters from control room. System integrates Wi-Fi and web interface.

AICP, Islamabad Pakistan

01-Nov-2023 - 30-Dec-2023

Applied object-oriented programming principles in C++ to design and implement key features for project. Gained hands-on experience in the full software development lifecycle, from requirements gathering to testing and deployment.

Optical NetworksandTechnologies(ONT)Lab,SEECS,Islamabad(ResearchAssistant)

02-Jun-2025 - 14-Jan-2026

5G Testbed with Optical Backhaul and O-RAN Integration: Deployed a standalone 5G network using FREE5GC and UERANSIM in virtual machines, interconnected via a 25km physical optical backhaul. Performed various tests to determine network performance under heavy traffic. ML-Powered Anomaly Detection for Telecom Networks: Designed and deployed a hybrid machine learning system on 4G KPI data. Engineered a Streamlit application for automated anomaly detection and report generation

CNIT Pisa, Italy and Scuola Superiore Sant’Anna, Pisa, Italy (Research Assistant in collaborative research project)

01-Sep-2025 - 22-Oct-2026

Collaborative Research: Dynamic URLLC/eMBB QoS Slicing over Optical xHaul for 5G/6G O-RAN Integration. Submitted to OFC Conference 2026, LA Convention Center, California, USA.

FINAL YEAR PROJECT

Intelligent Resource Allocation in ORAN(open radio access network)

Working on standard aligned MPLS QoS for ORAN xHaul.

TECHNICAL EXPERTISE

Finalist, Huawei National ICT Competition (Network Track)

Secured 20th rank nationwide and won a $200 voucher for the HCIA 5G RAN certification course.

PepsiCo Apprenticeship Program
Completedatwo-monthprogramfocusedonpersonal and skill development.

Cisco Certification
Networking Basics

Huawei Certification
PrinciplesandApplicationsof WLAN

Huawei Certification
HCIA 5G RAN

Ahmed Bhan

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PROFESSIONAL PROFILE

DevOps and AI Systems Engineer building the future of intelligent infrastructure. Architect production MLOps pipelines, autonomous LLM agents, and Large Action Models that bridge human intent with system execution. Expert in cloud-native orchestration (Kubernetes, AWS), reinforcement learning for adaptive systems, advanced GenAI frameworks, and CI/CD automation - synthesizing computer vision, deep learning, and full-stack engineering to create self-evolving infrastructure that learns, adapts, and scales.

EDUCATION

Bachelor of Electrical Engineering

SEECS , Islamabad , 3.38 (2026)

INTERNSHIP EXPERIENCE

3dim engineeringsolutions

17-Feb-2025 - 30-Jun-2025

Architected and deployed NVIDIA Triton Inference Server on Kubernetes clusters with auto-scaling policies, achieving 1000x latency reduction through TensorRT optimization (INT8/FP16 quantization) Optimized LeYOLO for small-object detection on drone datasets, deploying containerized workloads for edge devices with multi-stage Docker builds reducing image sizes by 60%

FINAL YEAR PROJECT

Baymax: Your Personal Healthcare Assistant

Architected multi-modal AI infrastructure on NVIDIA Jetson Nano, orchestrating Med-Gemma-4B via LangChain for context-aware health summaries by fusing vision, language, and sensor data streams. Deployed MobileNet and FaceNet with TensorRT optimization for real-time activity recognition and identity verification, achieving less than 100ms inference latency through GPU resource management. Implemented RAG pipeline using ChromaDB for patient history context with "Privacy-by-Design" ephemeral data processing and secure credential handling. Built containerized rPPG pipeline for contactless vital sign extraction.

TECHNICAL EXPERTISE

Cloud Infrastructure & DevOps Engineering

Expert in AWS cloud services (EKS, EC2, Lambda, S3, CloudFront) and container orchestration using Kubernetes and Docker. Proficient in building CI/CD pipelines with GitHub Actions, and managing production deployments with zero-downtime rolling updates. Experienced in microservices architecture.

MLOps & AI Infrastructure

Specialized in production ML deployment pipelines using NVIDIA Triton Inference Server, TensorRT optimization, and model quantization (INT8/FP16). Proficient in PyTorch, TensorFlow, ONNX, and Hugging Face frameworks. Expert in deploying ML models on edge devices and cloud infrastructure with auto-scaling poli ...

Generative AI & Large Language Models

Advanced expertise in LLM orchestration using LangChain, LangGraph, and LlamaIndex for building autonomous agents and RAG systems. Experienced with GPT, Llama, Gemini, Grok, and Gemma models. Skilled in developing Large Action Models (LAMs) for complex automation, multi-agent systems, and context-aware AI app ...

Computer Vision & Deep Learning

Proficient in real-time object detection, depth-estimation and tracking using YOLO (v5/v8), ByteTrack, DepthAnything and OpenCV. Experienced in semantic segmentation, face recognition (FaceNet), and activity recognition systems along iwth classical techniques like optical flow, structure from motion, stereo ...

Reinforcement Learning & Robotics

Experienced in deep reinforcement learning using Stable Baselines3, implementing DDPG algorithms for robotic manipulation tasks in PyBullet and Gymnasium environments. Skilled in reward shaping, curriculum learning, hyperparameter optimization, and deploying RL agents for autonomous decision-making systems ac ...

Full-Stack Development & Software Engineering

Expert Python programmer with strong proficiency in C/C++, JavaScript, and Node.js. Experienced in building REST APIs, React/Next.js applications, and Three.js visualizations. Proficient in database design (SQL, MongoDB), authentication systems (JWT, bcrypt), and low-level programming including x86 Assembly a ...

Mian Abdullah Afzal

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PROFESSIONAL PROFILE

Driven Electrical Engineering student at **NUST (SEECS)** with a specialized focus on **Embedded Systems and Industrial IoT**. Currently serving as the **Hardware Lead** for an AI-integrated Smart Power Management System. Expert in prototyping with **ATmega** and **Arduino** platforms, circuit simulation, and power electronics. Proven ability to translate complex academic concepts into validated hardware solutions with high precision and reliability.

EDUCATION

Electrical Engineering

SEECS , Islamabad (4)

INTERNSHIP EXPERIENCE

RIMMS undersupervisionofDrNosherwanShoaib.

21-Jul-2025 - 21-Sep-2025

Implemented core modules of an IoT-based energy monitoring system at a preliminary level. Established wireless communication between ESP32 and ESP8266 over ~18 meters with reliable data transfer. Performed ADC/DAC operations (10-bit resolution) and basic voltage measurement using a bridge rectifier circuit. Verified experimental results using a regulated 5V supply and Arduino IDE serial monitoring. Gained basic exposure to Python programming and data analysis using NumPy and Pandas. Developed foundational understanding of IoT communication, sensor interfacing, and power measurement concepts.

FINAL YEAR PROJECT

Hardware Lead | AI-Based Smart Power Management System

Architecture: Designing a central IoT hub using ESP32 for real-time monitoring of household and room-level consumption. Sensing & Precision: Integrating SCT-013 sensors with a 0.01A resolution and a PZEM-004T for high-accuracy utility-grade metering. Advanced Control: Engineering a 63A 2-Pole Contactor for main isolation and a multi-channel relay bank for individual room-line switching and load shedding. Safety Logic: Programming automated protection for over-voltage (>260V) and under-voltage (<160V) with a response latency of <50ms. AI Integration: Co-developing an o**ffl**ine TensorFlow Lite (LSTM) model for on-device bill forecasting and energy-saving recommendations.

TECHNICAL EXPERTISE

Embedded Systems:

ESP32, ATmega16/328P, Arduino, Embedded C/C++, Real-Time Data Acquisition.

Software & Simulation:

MATLAB (Certified), OrCAD Lite, LT Spice, Proteus, AutoCAD.

Power & Control:

Energy Monitoring (PZEM-004T, SCT-013), Relay Logic, High-Current Contactors.

Computer Languages:

C, C++, Python (Basics)

Muhammad Hassan

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PROFESSIONAL PROFILE

Firmware-focused Electrical Engineer with 2+ years of hands-on experience in firmware development for product-oriented embedded systems, specializing in RTOS-based architecture and low-level firmware on ARM Cortex-M, ESP, and Nordic platforms. Demonstrates strong command of scheduler behavior, context switching, ISR-to-task synchronization, queues, semaphores, mutexes, event groups, software timers, and watchdog supervision, with emphasis on real-time determinism and system stability. Experienced in bare-metal and RTOS firmware, HAL and register-level programming, custom driver development (SPI, I²C, UART, GPIO, ADC, PWM, DMA), and Bluetooth/BLE stack integration. Proficient in firmware architecture design, hierarchical state machines, bootloader-aware updates, low-power modes, clock configuration, memory mapping (Flash/RAM/heap/stack), and fault handling. Skilled in debugging and profiling using JTAG, RTT, logic analyzers, and protocol sniffers, with exposure to firmware–server integration for telemetry, logging, and diagnostics in industrial, IoT, and research environments.

EDUCATION

Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 2.62 (2026)

INTERNSHIP EXPERIENCE

Midas Safety

01-Aug-2023 - 30-Sep-2023

Implemented indexing and backup protocols for 30+ PLC systems (Siemens, Mitsubishi, Omron), ensuring data integrity and uninterrupted industrial operations. Assisted in PLC troubleshooting, system diagnostics, and automation workflows within a live manufacturing environment. Gained hands-on exposure to industrial automation, control systems, and operational safety standards.

Sky Electric

01-Jul-2024 - 31-Jan-2024

Contributed to the design and development of AI-driven solar inverter systems, working at the intersection of embedded hardware and firmware. Assisted in system integration, testing, and performance validation to improve inverter efficiency and reliability. Collaborated with multidisciplinary teams on product-oriented R&D, gaining exposure to real-world embedded energy systems.

MHTechFusion

01-Nov-2024 - 31-Dec-2026

Developing and debugging production-grade firmware for custom embedded products across ARM Cortex-M, ESP, and Nordic platforms. Designing RTOS-based firmware architectures, including state machines, task scheduling, inter-task communication, and power-optimized workflows. Implementing and maintaining low-level drivers (SPI, I²C, UART, GPIO, ADC, PWM) and integrating Bluetooth/BLE communication stacks. Collaborating with cross-functional teams on prototype bring-up, hardware validation, and product iteration, ensuring firmware stability and scalability. Supporting firmware–server integration for telemetry, logging, and remote diagnostics in connected devices.

FINAL YEAR PROJECT

Cloud-Connected ML Telemetry Retrofit Device for Solar Inverters

Developed a plug-and-play telemetry retrofit board for legacy (non-smart) inverters lacking built-in monitoring and fault-detection capabilities. The custom hardware integrates voltage, current, and auxiliary sensors to capture real-time electrical parameters without modifying the original inverter design. A comprehensive dataset was generated through controlled laboratory experimentation at London South Bank University, enabling data-driven analysis and fault modeling. Using this dataset, the system supports detection of

common inverter faults, including line-to-line and line-to-ground faults, while continuously monitoring power production and operational parameters via a centralized dashboard. The solution extends the usable life of existing inverters, reducing upgrade costs and minimizing electronic waste by eliminating the need for full system replacement.

TECHNICAL EXPERTISE

Firmware Development & RTOS

Expertise in low-level firmware development for embedded systems with strong command of RTOS-based architectures using FreeRTOS and Zephyr. Skilled in task scheduling, inter-task communication (queues, semaphores, mutexes), ISR design, timers, watchdogs, and state-machine implementation. Experienced in bare-m ...

Embedded Hardware & PCB Design

Hands-on experience in embedded hardware design and PCB development, including schematic capture, layout, and fabrication readiness. Proficient with KiCad, Altium Designer, Proteus, PSpice, AutoCAD, and component-level debugging. Strong understanding of MCU pin mapping, power domains, clocking, signal integri ...

Wireless, IoT & Connectivity

Experienced in IoT system development and wireless communication, including Bluetooth/BLE, Wi-Fi, and device telemetry. Skilled in ESP-IDF, Nordic SDKs, and integration of embedded firmware with cloud backends for monitoring, diagnostics, and data streaming. Familiar with Wireshark, protocol analysis, and sec ...

Embedded AI, Signal Processing & Sensing

Knowledge of embedded AI and signal-processing workflows for smart sensing applications, including CSI-based human presence detection, feature extraction, and ML-assisted decision pipelines. Familiar with data acquisition, preprocessing, visualization, and deploying lightweight intelligence on resource-constr ...

Industrial Automation & AIoT Systems

Experience in industrial automation and AIoT integration, including PLC programming, SCADA systems, and industrial communication workflows. Proficient with Siemens Simatic Manager, Mitsubishi FXTRN, and industrial system diagnostics. Strong understanding of Industry 4.0 concepts, combining embedded firmware, ...

Hafiza Adeela Arif

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PROFESSIONAL PROFILE

Final-year Electrical Engineering undergraduate with a strong academic background in communication systems, signal processing, and machine learning. Actively involved in research related to 6G networks and driven by a passion for innovation and research-oriented problem solving. Seeking opportunities to contribute to research and development in advanced communication technologies.

EDUCATION

BEE (Bachelor in Electrical Engineering)

SEECS , Islamabad , 3.39 (4)

INTERNSHIP EXPERIENCE

XFlow Research,Islamabad,Pakistan

01-Jul-2025 - 31-Aug-2025

Investigated NLP and transformer-based LLM/SLM architectures with emphasis on model e**ffi**ciency, scalability, and deployment trade-o**ff**s. Conducted research on model compression techniques (quantization, pruning, and knowledge distillation) to enable resource-constrained on-device inference.

Smart AgritechLab,SINES,NUST

01-Jun-2024 - 31-Aug-2024

Developed an automated system using YOLOv8 to identify individual cows from top-view images, enhancing farm management and safety. prepared the image dataset, applied augmentation techniques, and trained the model and validated performance on both static images and live video, ensuring accurate real-time detection.

FINAL YEAR PROJECT

Intelligent Physical Layer Security in HAPS-Integrated 6G Networks

I am currently pursuing my Final Year Project in the Information Processing and Transmission (IPT) Lab under the supervision of Dr. Syed Ali Hassan. My research focuses on developing and analyzing optimal intelligent techniques for enhancing physical layer security in High-Altitude Platform Station (HAPS)-based 6G networks.

TECHNICAL EXPERTISE

Libraries and Frameworks

Labelme, scikit-learn, pandas, NumPy, TensorFlow/Keras, OpenCV, scipy

Design and Simulation Tools

ModelSim, Proteus, LTspice, MATLAB/Simulink, LabView, Pspice

Programming Languages

Python, C/C++, C#, Assembly Language

Muhammad Ibrahim

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at NUST with practical experience in computer vision, embedded systems, and machine learning. Specialized in building real-time drone and IoT solutions, with a strong focus on deploying intelligent models on embedded hardware for reliable, real-world systems.

EDUCATION

Bachelors of Engineering in Electrical Engineering

School of Electrical Engineering and Computer Sciences (SEECS) , NUST , H12 , Islamabad , 3.23 (4)

INTERNSHIP EXPERIENCE

Nationa l AerospaceScience&TechnologyPark(NASTP)

25-Jul-2025 - 25-Aug-2025

Computer Vision & Web App Development Intern -Developed a computer vision–based business card digitization system for automated text extraction and Excel export. -Contributed to backend development of a seller-side e-commerce web application for product and order management.

DroNext Pvt.Ltd.,GraduateResearchComplex,SEECSNUST

10-Jun-2025 - 23-Jan-2026

Computer Vision Intern -Worked on the computer vision module of a vision-guided autonomous drone project. -Implemented YOLO-based object detection for real-time target detection and tracking.

FINAL YEAR PROJECT

Taak: Vision-Guided Laser Tracking System for Autonomous Drone Missions

Developing an intelligent autonomous drone system leveraging computer vision and machine learning for real-time multi-class object detection, tracking, and re-identification. The drone is capable of autonomous navigation and adaptive target tracking, integrating flight control with coordinated, deployable ML models to maintain robust multi-object tracking in dynamic environments.

TECHNICAL EXPERTISE

Programming:

C, C++, Python, Verilog

Machine Learning & Computer Vision:

OLOv8, OpenCV, PyTorch, TensorFlow, DeepSORT, Scikit-learn

Simulation & Design:

MATLAB, Simulink, Proteus, PSPICE, Quartus, ModelSim, MATLAB DSP Toolbox

Embedded Systems & Hardware:

ESP32, STM32, Arduino, FPGA, ATmega16, UART/SPI/I2C

Software Tools & IDEs:

LabVIEW, Arduino IDE, Blynk, AutoCAD, Google Colab, MS Office

Other Skills:
Canva,Engineering Project Management, Technical & Business Writing, Team Collaboration, Communication,

Ayesha Khan

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PROFESSIONAL PROFILE

Please update objective section.

EDUCATION

Secondary School Education
Fauji Foundation College For Girls , Rawalpindi , 1085/1100 (2020)

A levels
Supernova School , Islamabad , A* in all three subjects (2022)

INTERNSHIP EXPERIENCE

FINAL YEAR PROJECT

No project information available.

TECHNICAL EXPERTISE

Nayab Nazar

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PROFESSIONAL PROFILE

A highly motivated and research driven final year Electrical Engineering student with a minor in Artificial Intelligence, specializing in autonomous systems, nonlinear control, and edge AI. Possesses hands-on experience in designing and implementing advanced control algorithms for UAVs/USVs, developing real-time computer vision models for edge deployment, and leading multi-agent robotic projects for environmental monitoring. Demonstrated ability to conduct end-to-end research, from simulation and optimization to hardware-in-the-loop testing and field deployment. Have a a strong publication record including conference papers and journal submissions. Proven leadership through founding technical initiatives, managing interdisciplinary teams, and serving as an elected student representative. Seeking to apply expertise in robotics, AI, and embedded systems to innovative R&D or engineering roles in autonomous technology.

EDUCATION

Higher secondary school education
Govt. Degree College Tararkhel, Azadkashmir , Tararkhel, Azadkashmir , 1072/1100 (2022)

Electrical Engineering
SEECS(School of Electrical Engineering and Computer Science) NUST-H12 , Islamabad , 3.2 (2026)

INTERNSHIP EXPERIENCE

ResearchAssistant—DigitalTwinLab,SINES (NUST)

01-Jul-2025 - 01-Jun-2026

Developing and deploying a fleet of three autonomous Unmanned Surface Vehicles (USVs) for persistent, real-time water quality and environmental monitoring across rivers, lakes, ponds and coastal waters. The system integrates modular payloads and on-board sensor-fusion (GPS/IMU/camera/sonar) to deliver high fidelity telemetry. USVs operate under hybrid swarm control architectures—centralized mission orchestration and leader–follower or leaderless decentralized consensus—enabling cooperative task allocation, formation, control, adaptive path-planning and robust inter-vehicle coordination. Communications include ground station USV telemetry and low-latency inter-USV links for real-time coordination; emphasis is placed on fault-tolerance, energy-aware mission scheduling, hardware-software integration, and hardware-in-the-loop plus field validation. The mission objective is scalable, resilient autonomous monitoring with extensibility toward advanced maritime sensing and multi-mission applications.It is funded by NESCOM and RIC NUST.

CSN(Communication SystemsandNetworkingLab)SEECS-NUST

01-Jun-2025 - 01-Sep-2025

Focused on Edge AI Deployment and UAV Communication Systems ML Model Deployment on Edge: Optimized and deployed real-time fire and smoke detection models (YOLO/UNet variants) on embedded platforms, using TensorRT for inference acceleration on NVIDIA Jetson devices. Edge Computing Pipeline: Developed a full sensor-processing pipeline on UAVs, integrating camera feeds with onboard AI inference for immediate threat detection without cloud dependency. Communication System Testing: Assisted in testing and implementing robust communication protocols between UAVs and ground stations to ensure stable data transmission in remote environments. System Integration Support: Contributed to integrating the AI detection module with the ground control software and alerting system used in the lab’s ongoing UAV projects.

Undergraduate Researcher — Graduate Research Complex, SEECS – NUST

15-Sep-2024 - 15-Sep-2025

Conducting advanced research on nonlinear control of underactuated bicopter UAVs, focusing on robust and optimized controller design. Authored a research paper titled “Advanced Optimized Nonlinear Control of Bicopter UAVs” currently under peer review.

Designed and implemented Sliding Mode Control (SMC) and higher-order controller variants, optimized using metaheuristic algorithms such as Red Fox Optimization (RFO) and Parallel Particle Swarm Optimization (PPSO) to enhance robustness and convergence speed. Developed ANN and BiLSTM surrogate models to enable real-time onboard computation of nonlinear controllers. Conducted extensive MATLAB/Simulink simulations and hardware-in-the-loop testing to validate trajectory tracking, attitude stabilization, and disturbance rejection performance. Evaluated controller e**ff**ectiveness using IAE, ISE, and ITAE metrics, achieving reduced chattering and improved tracking accuracy. Collaborated in lab-scale UAV experiments and multi-agent swarm simulations, integrating sensor feedback and real-time telemetry. Contributed to code optimization, data logging, and documentation
to support reproducible research and future publications.

Smart Agritech&SignalProcessingLab(SINES)
01-Jun-2024 - 01-Sep-2025

During my internship at Agritech Lab, I focused on developing robotic and autonomous systems tailored for agricultural applications, combining embedded hardware, sensor integration, and IoT solutions. Agriculture Robot Development Designed and implemented an autonomous agriculture robot equipped with obstacle avoidance and plant detection for precision spraying. ESP Microcontroller Projects Integrated various environmental and proximity sensors with ESP microcontrollers, implementing data logging and wireless communication solutions. Image Fusion for Leather Processing Developed multi-camera image fusion techniques to create optimized composite images for quality assessment in agricultural byproduct processing. Cattle Management Website (UI/UX Designer) Designed a user-friendly web platform for tracking cattle health, feeding schedules, and operational management for farm administrators.

EMBEDAIOTSMARTERSOLUTIONS (Islamabad)
01-Jun-2024 - 01-Aug-2024

I contributed to a range of embedded systems and industrial IoT projects, focusing on autonomous systems, sensor research, and motor control applications. Autonomous Vehicles Researched and developed unmanned autonomous vehicle systems, focusing on flight controller selection and ground station software interfacing. SPEC Sensors and Potentiostats Research Investigated SPEC electrochemical sensors and potentiostats for accurate carbon monoxide (CO) detection in IoT-based monitoring systems. Variable Frequency Drives (VFDs) and Induction Motors Developed control solutions for 3-phase induction motors using VFDs to enable precise speed regulation in industrial automation setups. Supply Chain Management Website (UI/UX Designer) Designed an intuitive web interface for real-time supply chain tracking, logistics management, and operational analytics.

Halool Pvt.Ltd.,Islamabad
01-Dec-2023 - 30-Mar-2024

Designed user interfaces and user experiences for digital products using Figma, contributing to wireframes, prototypes, and usability testing.

FINAL YEAR PROJECT

AI-Powered UAV System for Early Wildfire Detection and Prevention

Developing an AI-augmented UAV platform for real-time wildfire detection and situational awareness for fire department of Pakistan. Integrated NVIDIA Jetson Nano for edge-based fire segmentation, victim localization, and path planning. Designed dual-interface system: ∗ Public portal for alerts and fire reporting ∗ Fire department portal for UAV monitoring and control. Ongoing research and development on multi-UAV swarming for large-scale deployment

TECHNICAL EXPERTISE

Core Research & Development Areas

Autonomous Systems & Robotics: Design and control of UAVs (bicopters, multirotors), USVs, and multi-agent swarms for environmental monitoring, surveillance, and emergency response. Nonlinear Control & Optimization: Advanced controller design using Sliding Mode Control (SMC), PID, and metaheuristic optimiza ...

Programming & Tools

Languages: Python, C/C++, MATLAB/Simulink, Embedded C AI/ML Frameworks: PyTorch, TensorFlow, OpenCV, Scikit-learn Simulation & Modeling: MATLAB/Simulink, Simscape, ROS (Robot Operating System) Embedded Platforms: NVIDIA Jetson Nano/Orin, Arduino, ESP32/8266, Raspberry Pi Design & Prototyping: Alti ...

Key Technical Projects & Achievements

FireLite-Seg: Lightweight segmentation model for wildfire detection achieving >96% precision and real-time inference on Jetson Nano

(9.65–11.64 FPS). Nonlinear Bicopter Control: Designed SMC-based controllers optimized via RFO/PPSO, validated in simulation and hardware-in-the-loop. Autonomous USV Fleet: ...

Laboratory & Field Experience

Hardware-in-the-Loop (HIL) Testing Sensor Integration & Calibration Real-Time Telemetry & Data Logging Field Deployment of Robotic Systems PCB Design & Prototyping

Publications & Research Output

Conference Paper (Under Review): "Edge-Enabled Real-Time Fire Segmentation from UAV-Based Aerial Imagery" . Co-authored; developed FireLite-Seg model achieving 96.32% precision and real-time performance on Jetson Nano. Journal Manuscript (In Preparation): "State of the Art and Future Research Challenges fo ...

Muhammad Huzaifa

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PROFESSIONAL PROFILE

Electrical engineering graduate from a Pakistan top-ranked university, proficient in Quartus intel, Vivado, Google colab, ModelSim, Protues, Pspice, Labview, Matlab Simulation, AutoCAD, Atmel Studio and Visual studio. Extensive experience in technical expertise, innovative problem-solving, and hands-on experience in circuit design, control systems, power electronics, and process optimization using AI. Eager to use AI and ML to develop a FPGA-based AI accelerator system for different disease.

EDUCATION

BE Electrical Engineering

SEECS, NUST, Islamabad , Islamabad , 2.7 (2026)

INTERNSHIP EXPERIENCE

System onchip(SoC),SINES,NUST,Islamabad

01-Aug-2024 - 15-Sep-2024

•Completed 1.5 month research internship at SoC Lab, SINES, NUST. •Worked on processor design with Verilog, simulation, and hardware testing. •Completed 11 lab sessions demonstrating strong grasp of digital systems.

System onchip(SoC),SINES,NUST,Islamabad

15-Jun-2025 - 15-Sep-2025

•Developing an FPGA-based AI accelerator for pneumonia and tuberculosis detection in X-ray images. •Implementing Vision Transformers (ViT) and CNN with FPGA optimization for real-time, low-latency inference. •Conducted literature review of 50+ research papers on AI accelerators and medical imaging.

Upwork , Fiverr

01-Aug-2023 - 16-Jan-2026

•Completed Electrical engineering tasks (e.g., circuit analysis, control systems, DSP, verilog codes). •Delivered simulation based solutions using tools like MATLAB, Multisim, and Proteus. •Assisted with Verilog coding, system modeling, and project debugging remotely.

FINAL YEAR PROJECT

Edge-AI Accelerator: FPGA-Powered Real-Time Diagnosis and Report Generation

•Developing an FPGA-based AI accelerator for pneumonia and tuberculosis detection using chest X-ray images. •Implementing Vision Transformers (ViT) and CNN models with FPGA optimization for real-time, low-latency inference. •Integrating LLMs (e.g., MedGemma) for automated medical report generation to assist clinical diagnosis.

TECHNICAL EXPERTISE

Technical proficiency

C / C++ / Embedded C / Verilog HDL / Assembly / RISCV / Quartus / ModelSim / Vivado / MATLAB / Proteus / Pspice / FPGA Design / Computer Architecture / AI Accelerators / Signal Processing

Muhammad Talha

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at NUST with strong hands-on experience in digital system design, RTL implementation, and functional verification. Skilled in Verilog/SystemVerilog, circuit analysis, and simulation using industry-standard EDA tools. Experienced in power and lighting systems through industrial internship exposure. A collaborative and detail-oriented team player with a strong focus on safety, compliance with standards, and meeting project deadlines. Seeking opportunities to apply technical expertise in digital design, embedded systems, and electrical engineering projects.

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 2.8 (2022 – 2026)

INTERNSHIP EXPERIENCE

Islamabad CarriageFactory

22-Aug-2022 - 09-Sep-2022

Collaborated with cross-functional teams to integrate electrical engineering solutions in multidisciplinary projects. Maintained compliance with environmental and safety regulations while supporting power and lighting installations. Assisted in planning and establishing delivery and installation schedules for machines, cables, and electrical fittings, ensuring timely execution of tasks and adherence to project requirements.

FINAL YEAR PROJECT

AI-Based Multi-Disease Diagnostic System Using X-ray Images and Facial Analysis on FPGA

This project focuses on the development of an AI-based diagnostic system that utilizes deep learning techniques to detect multiple diseases through the analysis of X-ray images and facial photographs. Convolutional Neural Networks (CNNs) are employed to identify patterns associated with lung, cardiac, and other medical conditions from X-ray data, while facial image analysis is used to extract indicators of additional health abnormalities. To achieve high-speed and energy-efficient processing, the trained deep learning models are implemented on an FPGA platform, enabling hardware-accelerated inference with low power consumption. By fusing information from multiple image modalities and leveraging FPGA-based acceleration, the system aims to provide rapid and accurate disease detection, supporting early diagnosis in resource-constrained healthcare environments.

TECHNICAL EXPERTISE

Digital System Design & RTL Development

Experience in designing and implementing digital systems using Verilog and SystemVerilog, including RTL development, simulation, and functional verification. Familiar with testbench creation, debugging, and timing analysis using industry-standard EDA tools.

FPGA Design & Hardware Acceleration

Hands-on experience with FPGA-based system implementation, synthesis, and testing. Knowledge of deploying computational models on FPGA for high-speed and low-power applications using tools such as Quartus and ModelSim.

Embedded Systems & Programming

Skilled in embedded system development using C, C++, and Python. Experience with microcontrollers, sensor interfacing, and real-time system behavior in academic and project-based environments.

Mohammad Owais

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PROFESSIONAL PROFILE

Electrical Engineering student with hands-on experience in embedded systems, robotics, and real-time computer vision on embedded platforms. Interested in entry-level roles involving embedded software, robotics, and applied AI systems.

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering and Computer Science (SEECS) , Islamabad , 3.36/4 (2026)

INTERNSHIP EXPERIENCE

Fatima FertilizerCo.Ltd.(Pak-ArabPlant)

16-Jun-2025 - 28-Jul-2025

Worked in an industrial process plant environment with exposure to automation and instrumentation systems. Assisted in the DCS Centum VP Simulator Revival Project, gaining practical understanding of control logic and system operation. Analyzed P&ID diagrams of the ammonia refrigeration system, studied control valves and field instrumentation, and reviewed cause-and-effect documentation to understand safety interlocks and control workflows. This experience provided practical insight into real-world control systems and industrial standards.

ChipXPRT

15-Jul-2024 - 02-Sep-2024

Worked on implementing UART communication over a Wishbone bus to interface with an RV32IMAC RISC-V processor on an FPGA. Developed the design in Verilog using Vivado, gaining hands-on experience with digital design, SoC interfacing, and embedded hardware workflows.

FINAL YEAR PROJECT

Deep Learning–Based Drone Detection and Tracking

Developing a real-time drone detection and tracking system using live video from a Viewpro Q10N gimbal-mounted camera, deployed on NVIDIA Jetson embedded platforms. The system performs YOLO-based object detection and multi-object tracking under strict real-time constraints, with deployment initially on Jetson Nano and later scaled to Jetson Orin Nano for improved inference throughput. Perception outputs are integrated with a custom Python-based gimbal control interface using packet-level communication, enabling closed-loop, image-plane error–based visual tracking rather than standalone detection. The project focuses on system-level challenges such as inference latency, communication delays, control stability, and robustness in embedded deployment, with a modular architecture designed to support future extensions in tracking, control tuning, and decision logic.

TECHNICAL EXPERTISE

Programming Languages

C, C++, Python, MATLAB, Assembly, Verilog

Embedded & System Software

STM32F7, ESP32, FreeRTOS, Embedded Linux

Hardware & Engineering Tools

NVIDIA Jetson Nano, Jetson Orin Nano, FPGA platforms, Vivado, ModelSim, MATLAB, Proteus, STM32CubeIDE

AI & Computer Vision
PyTorch,OpenCV,YOLO-based object detection, ByteTrack multi-object tracking, TensorRT optimization

Muhammad Atif

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PROFESSIONAL PROFILE

A final-year electrical engineering student with hands-on experience in UAV systems engineering, flight-control design, and embedded systems integration. Proven ability to work on fixed-wing VTOL platforms, including propulsion system development and autopilot configuration. Strong foundation in control systems, avionics, and real-time embedded programming, with practical experience in flight testing, data analysis, and system validation. Highly motivated engineer seeking graduate-level roles in UAV systems, embedded systems, flight-control, or avionics engineering.

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering and Computer Science (SEECS) , Islamabad , 2.13 (2026)

INTERNSHIP EXPERIENCE

Dronext Pvt.Ltd(SEECS)

01-Jul-2025 - 08-Sep-2025

During this internship, I worked on the design, integration, and testing of a fixed-wing VTOL UAV, contributing to propulsion architecture, avionics integration, and flight-control systems. I developed and integrated a hybrid propulsion system combining vertical-lift and forward-thrust motors and supported system-level performance validation. I implemented flight-control algorithms and autopilot configurations, including VTOL transition control mixing and PID tuning to ensure stability and smooth mode transitions. Additionally, I conducted bench testing and flight trials, analyzed flight telemetry data, and iteratively refined control laws to improve flight performance, reliability, and robustness.

FINAL YEAR PROJECT

Ababeel: An AI-Driven Swarming Drone Network

This project proposes the development of IntelliSwarm, an intelligent and adaptive swarm of autonomous drones designed to operate in dynamic environments with decentralized control. The system features a hierarchical yet flexible architecture where a primary master drone coordinates multiple slave drones, with built-in capability for any slave to seamlessly assume the master role upon failure detection. The swarm will be built using cost-effective hardware, with a focus on modular integration, real-time communication, and fault-tolerant behavior. Machine Learning (ML) algorithms will be employed for data-driven decision-making, environmental awareness, and adaptive mission execution. The project aims to design, simulate, and prototype a robust drone swarm with scalable, self-healing communication protocols and AI-enhanced autonomy, suitable for applications in surveillance, search-and-rescue, and environmental monitoring.

TECHNICAL EXPERTISE

UAV Systems Engineering

Hands-on experience in the design, integration, and testing of fixed-wing VTOL UAVs, covering propulsion architecture, avionics integration, and system-level validation.

Flight Control & Autopilot Systems

Implemented and tuned flight-control algorithms, including VTOL transition control mixing and PID control, using embedded autopilot stacks for stable and reliable flight.

UAV Testing & Validation

Conducted bench testing and flighttrials, analyzed flight telemetry data, and refined control laws to improve UAV performance, robustness, and reliability.

Muhammad Hussnain

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PROFESSIONAL PROFILE

Electrical Engineering Undergraduate at NUST | In-Memory Computing & AI on SoCs | Data, Operations & Process Improvement Enthusiast

Hi, I'm Muhammad Hussnain, an Electrical Engineering undergraduate at NUST Islamabad with a strong foundation in embedded systems and advanced computing, paired with a growing focus on data analytics, operations, and business impact.

My Final Year Project centers on in-memory computing and transformer-based models on SoCs, where I'm working with hardware- aware AI, signal processing, and real-time optimization. This has strengthened my ability to think at both system and architectural levels—balancing performance, efficiency, and practical constraints.

Alongside my technical work, I've actively upskilled in Power BI, Six Sigma (Yellow Belt), and supply chain fundamentals, and gained hands-on experience through internships and leadership roles in student-led initiatives. I enjoy applying structured, analytical thinking

to improve processes, analyze performance, and turn complex data into actionable insights.

I'm currently exploring opportunities in management trainee programs, operations, supply chain, and data/business analytics, especially in environments that value continuous improvement and cross-functional thinking.

Open to internships, graduate programs, and collaborative opportunities across technology, analytics, and operations.

EDUCATION

Electrical Engineering

School of Electrical Engineering & Computer Science , Islamabad (2026)

INTERNSHIP EXPERIENCE

Avionics Solutions

01-May-2025 - 02-Sep-2025

At Avionics Solutions, I worked on the design and implementation of a Manchester Encoder/Decoder system using the TI C2000 (F280039C) platform, leveraging CLB, DSP, and CLA modules for real-time avionics applications. My responsibilities included developing embedded C code, configuring EPWM and GPIO peripherals, and integrating interrupt-driven logic for reliable signal transmission. I also carried out hardware testing and debugging using oscilloscopes and logic analyzers, ensuring robust system performance. This project not only strengthened my expertise in embedded systems and digital signal processing but also aligned academic research with practical industry needs.

Startify Funpulse

01-May-2024 - 02-Sep-2024

Collaborated with the Digital Services division to design and prototype AI-powered features for gaming and web platforms, aligning with the company's mission to blend technology and creativity Developed machine learning models to enhance user experiences—such as adaptive content recommendations and intelligent in-app assistants—for fun, immersive environments. Implemented end-to- end AI workflows: data gathering, preprocessing, modeling, tuning, and deployment, working closely with cross-functional teams. Tested models using real user data to ensure performance, reliability, and scalability within Startify's immersive solutions. Presented findings and demos to stakeholders, highlighting how AI-driven enhancements could boost engagement and product usability.

Korea EHT

31-May-2023 - 08-Sep-2023

Project Management & EPC Surveyor(Handled Local Buyer and Contractor Agreements)

Excelerate

01-Jun-2025 - 30-Sep-2025

• Led a 6-member intern team to plan a global virtual event, driving early project momentum and alignment. • Delivered key planning documents (charters, timeline, risk register) for smooth execution. • Strategically aligned goals with a 6-month deadline and $30,000 budget, minimizing risks and delays.

Interloop Limited
01-Jun-2023 - 02-Sep-2023

Supported manufacturing operations by coordinating production flow, material availability, and shop-floor activities to meet daily output targets. Assisted in monitoring work-in-progress (WIP) and material movement across production stages to minimize delays and bottlenecks. Collaborated with planning and quality teams to ensure smooth execution of production schedules aligned with customer delivery timelines. Gained hands-on exposure to large-scale export-oriented manufacturing processes and operational discipline in a multinational setup. Observed compliance with quality, safety, and operational standards followed in global textile supply chains.

FINAL YEAR PROJECT

In-Memory Computing Unit for Energy-Efficient Data Processing.

Designed and engineered an in-memory computing architecture to reduce data movement overhead and improve computational efficiency. Modeled memory-centric dataflow for parallel logic and vector operations and implemented digital control and processing blocks using hardware description logic. Analyzed latency, throughput, and power trade offs relative to conventional von Neumann architectures and evaluated system performance through simulation-based verification.

TECHNICAL EXPERTISE

Project Management – Real Estate & Operations (CBRE)

Developed understanding of end-to-end project coordination, timelines, stakeholder communication, cost tracking, and operational execution in a corporate real estate environment through CBRE's project management exposure.

Supply Chain Fundamentals – GE Aerospace

Explored end-to-end aerospace supply chain operations including procurement, inventory management, supplier coordination, demand planning, and quality compliance within a regulated, high-reliability manufacturing environment.

Customer Field Operations & Technical Support – nbn™ Australia

Gained practical exposure to customer-facing field operations, basic network troubleshooting, service installation workflows, and issue resolution while maintaining service quality and safety standards in a real-world telecommunications environment.

On-Premise Sales Operations – Red Bull

Developed understanding of on-premise sales execution, outlet activation, customer engagement, demand visibility, and basic sales performance tracking within a fast-moving consumer goods (FMCG) environment.

Project Management – Transportation & Mobility Systems (Siemens Mobility)

Gained exposure to project planning and coordination within large-scale mobility and transportation projects, including schedule tracking, stakeholder communication, documentation flow, and execution alignment in an engineering-driven environment.

Six Sigma Yellow Belt – Process Improvement

Applied Six Sigma fundamentals and the DMAIC framework to understand process mapping, root cause analysis, variation reduction, and data-driven decision making using basic quality tools.

Computer Vision Fundamentals using OpenCV & Python

Developed foundational skills in computer vision including image preprocessing, edge detection, feature extraction, and basic object analysis using OpenCV and Python.

End-to-End Supply Chain Management – Rutgers University

Developed structured knowledge of supply chain logistics, operations execution, demand planning, sourcing strategies, and supply chain design, emphasizing data-driven decision-making and operational performance.

Huzaifa Ahmad

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PROFESSIONAL PROFILE

As an electrical engineer, dedicated to delivering innovative solutions with a focus on quality and safety. Seeking to contribute technical expertise and collaborative skills to a dynamic team.

EDUCATION

Electrical engineering

SEECS , Islamabad , 2.54 (2022)

INTERNSHIP EXPERIENCE

Pakistan AeronauticalComplexKAMRA

02-Jun-2025 - 11-Jul-2025

Gained hands-on experience in avionics systems, electronics testing, and defence-related electrical engineering applications.

DroNext Lab,SEECS,NUST

14-Jul-2025 - 11-Sep-2025

Assisted in the development of drone-based autonomous systems and sensor integration for defence applications. Worked on control systems design and signal processing for UAVs.

FINAL YEAR PROJECT

AI enhanced Intelligent Nonlinear Control Framework for Biomedical System

TECHNICAL EXPERTISE

Sliding Mode Control–Based Optimization of Antiviral Therapy for Chronic Hepatitis C

Implemented Sliding Mode Control (SMC) and Integral Super-Twisting SMC (ISTSMC) in MATLAB Simulink to regulate healthy hepatocyte levels while eliminating infected cells and virions, achieving convergence times of 41-46 days for infected cell eradication. Developed and simulated a nonlinear mathematical ...

Muhammad Hamza Ijaz

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PROFESSIONAL PROFILE

Bachelor's in Electrical Engineering and software developer with a research focus on **Quantum Computing**, particularly **Quantum Federated Learning (QFL)** and distributed intelligence. Experienced in **machine learning**, **post-quantum cryptography**, and quantum-safe smart contract development, with practical skills in **mobile and web application development** and **Linux-based environments**. Passionate about solving real-world problems through research-driven software development.

EDUCATION

BACHELOR OF ELECTRICAL ENGINEERING

School of Electrical Engineering and Computer Science , Islamabad, sector H-12, main campus , 2.66 (2022)

INTERNSHIP EXPERIENCE

Upwork , MobileAppDeveloper

01-May-2025 - 26-Jan-2026

Mobile App Developer with experience building scalable, user-friendly Android applications, handling both frontend and backend development, API integration, performance optimization

Optical NetworksandTechnologiesLab,Seecs,Nust,Remote

29-Jul-2025 - 16-Oct-2025

Deployed a NETCONF client–server setup using Netopeer2 and Sysrepo for network automation, designed virtual networks with Docker, and simulated SDN scenarios using Mininet.

QuantumRonics , EvacueeTrustComplex,F-5,Islamabad,Hybrid

27-Oct-2025 - 30-Jun-2026

Researching PQC-enabled blockchain systems, focusing on quantum-resistant cryptography and secure smart contract integration.

TechnoSofts, SoftwareDevelopmentHouse,Sialkot,OnSite

29-Jun-2025 - 09-Oct-2025

Developed and deployed the VPN MAX mobile app (frontend & backend) to the Google Play Store, and contributed to Shield VPN, currently under review.

FINAL YEAR PROJECT

Analyzing Federated Learning Techniques in Quantum Computing Environments for (QFL) Applications

This project studies quantum-based federated learning (QFL) using Qiskit simulations, analyzing noise, qubit limitations, and scalability, and comparing quantum and classical FL in terms of convergence, efficiency, and robustness.

TECHNICAL EXPERTISE

Research in QFL, Mobile App Dev

Quantum Computing (Qiskit, QFL), Machine Learning models, Post-Quantum Cryptography and smart contract security, Mobile App Development (frontend & backend), Web Development, Linux-based development, networking and SDN simulation, API integration, and system optimization.

Muhammad Essa

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PROFESSIONAL PROFILE

AI-native Electrical Engineering graduate with hands-on experience in AI-assisted web development, Python programming, and power generation systems through industry internship. Active day trader with strong interest in quantitative finance and data-driven decision making. Skilled in leveraging modern AI tools, AutoCAD, and engineering fundamentals to build practical technical solutions across software, finance, and engineering domains.

EDUCATION

Electrical Engineering

Seecs , Islamabad , 2.71 (4th)

INTERNSHIP EXPERIENCE

Pioneer PowerGeneration

01-Jun-2025 - 30-Jul-2025

Understanding the working of generators and power houses On site working on setting and syncing gensets Office work

FINAL YEAR PROJECT

Subscription based web 3 ecosystem

This project allows users to subscribe to services, pay for products using any crypto and it is converted into a single standardised crypto currency that we have created and gets recieved by merchants. This allows standardization of crypto currency for this specific tasks Users earn rewards for payments, invites, staking thus supporting the ecosystem. The main highlights of the project are 1. Merchants can easily adopt crypto because it is only recieved in a single token 2. Users gets cashbacks rewards 3. Auto buying within the ecosystem creates automatic demand 4. Automatic demands allow for more investors due to increased earning. 5. The price fluctuates based on users and uses.

TECHNICAL EXPERTISE

AI Tools & Automation

Experienced in using AI systems to build websites, generate code, automate workflows, and accelerate development. Strong in prompt engineering and integrating AI into practical projects.

AI-Assisted Web Development

Builds functional websites using AI-driven tools and platforms, focusing on rapid prototyping, design, and deployment.

Python Programming

I use Python for scripting, automation, and problem-solving, with growing focus on data analysis and computational tasks.

Aspiring Quantitative Finance Analyst

Actively learning quantitative finance concepts including financial markets, data analysis, and algorithmic strategies, with the goal of building trading and investment models.

Day Trader / Stocks

Actively trades financial markets using technical analysis, market structure, and risk management strategies.

Short-Form Content Creator
CreateseducationalandengagingYouTube Shorts focused on finance, trading, and technology, including scripting, editing, and audience growth.

AutoCAD Designer
UsesAutoCADfor2Dtechnical drawings, layouts, and design documentation.

Huzaifa Akhtar

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PROFESSIONAL PROFILE

Versatile Electrical Engineering student with a unique passion for bridging the gap between hardware and software. My technical expertise spans the full stack: from designing low-level architectures using Verilog/RISC-V and FPGAs to developing high-level software solutions. I am experienced in building machine learning pipelines with Python, creating data-driven web applications, and developing desktop software. I thrive at the intersection of these fields, building systems where e**ffi**cient hardware meets intelligent software

EDUCATION

Matric
Hadiqat Foundation High School , Lahore , 1100 (2020)

FSc
Unique College Lahore , Lahore , 947 (2022)

INTERNSHIP EXPERIENCE

Al-Khidmat Foundation

01-Jun-2023 - 01-Sep-2023

Social Media Compaign Managment

Nust ChipDesignCenter

01-Jun-2026 - 01-Sep-2026

Implemented an AXI-AHB bridge module to handle signal synchronization and data transfer between different bus architectures

FINAL YEAR PROJECT

An AI-based diagnostic involving X-ray images and facial photos to detect multiple diseases

AI-Based Multi-Modal Disease Diagnostic System "Developed a dual-input diagnostic system that leverages Computer Vision and Deep Learning to detect multiple pathologies. The system fuses medical X-ray imagery with facial biomarker analysis to improve diagnostic accuracy. Designed to potentially run on edge devices, the project explores optimizing Convolutional Neural Networks (CNNs) for efficient inference on embedded hardware, aiming to provide accessible healthcare solutions."

TECHNICAL EXPERTISE

HDLs & Architectures

Verilog, SystemVerilog, RISC-V Processor Design, Computer Architecture (Pipelining, Tomasulo's Algorithm, Cache Memory)

Microcontrollers & IoT

Arduino, ESP8266/ESP32, PLC Programming (Ladder Logic), IoT Sensor Integration (Air Quality Monitors)

Artificial Intelligence & Computer Vision

Machine Learning: Supervised Learning, SVM Classifiers, Neural Networks (CNNs). Computer Vision: OpenCV, Object Detection (YOLO), Feature Extraction (SIFT, Harris Corners, Optical Flow), Image Segmentation. Projects: Multi-modal Disease Detection (X- ray + Facial biomarkers), Hand-movement Game Control.

Software & Web Development

Languages &Frameworks:Python, React.js, JavaScript (ES6+), HTML/CSS, SQL. Web Projects: Prepify (EdTech Platform), Interactive Web Games. Desktop & Tools: Emojipad (Desktop App), Custom Automation Scripts. AI Engineering: AI-Integrated Browser Extensions, Review Summarizers, API Integration.

Muhammad Ibtasam Amir

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PROFESSIONAL PROFILE

Curious and hands-on embedded systems engineer with experience in firmware development, hardware design, and end-to-end system implementation. Skilled in developing and debugging real-time applications on STM32 and ESP32 microcontrollers, and designing PCBs integrating power electronics, communication interfaces, and sensors. Experienced in interfacing peripherals over SPI, I²C, UART, and RS-485, and implementing real-time systems with FreeRTOS. Strong background in energy monitoring devices, emphasizing accuracy, reliability, and attention to detail. Passionate about prototyping, testing, and refining designs to build robust, long-lasting systems, bridging the gap between firmware, hardware, and production.

EDUCATION

Bachelor in Electrical Engineering

School of Electrical Engineering and Computer Sciences , Islamabad , 3.43 (2026)

INTERNSHIP EXPERIENCE

EmbedAIoT

01-Jun-2024 - 01-Sep-2024

Gained hands-on experience in IoT and embedded systems by developing firmware for ESP32 microcontrollers and implementing LoRa-based communication. Worked on prototyping and testing embedded devices, explored energy metering ICs, and programmed them for accurate data acquisition. Participated in full-cycle development from hardware interfacing to firmware integration, gaining practical exposure to sensors, communication protocols, and real-time embedded design.

MH TechFusion

08-May-2025 - 25-Sep-2025

Designed and developed PCB layouts, selected components, and created schematics for embedded systems projects. Gained hands-on experience in component selection, footprint verification, and signal/power integrity considerations.

EmbedAIoT

01-Sep-2024 - 25-Jan-2026

Embedded System Engineer Worked on the design and development of IoT products, including weather stations and energy meters. Designed PCBs, selected components, and developed firmware for microcontrollers such as ESP32/ESP8266, STM32, 8051, and PIC. Implemented communication protocols including LoRa, ESP-NOW, RS485, Wi-Fi, BLE, and 4G/LTE modules. Gained hands-on experience in end-to-end system development, from hardware design and prototyping to firmware integration and testing.

FINAL YEAR PROJECT

RF Fingerprinting for IoT Device Security Using Deep Learning

Developed a Radio Frequency Fingerprinting system using the ADRV9364-Z7020 SDR platform to uniquely identify and classify wireless transmitters based on their RF hardware characteristics. The system captures and processes baseband I/Q data using the Zynq-7020 SoC, combining FPGA-based signal acquisition with processor-side feature extraction and analysis. By leveraging subtle RF impairments such as frequency offset, phase noise, and transient behavior, the design enables reliable device identification and authentication at the physical layer for secure wireless communications.

TECHNICAL EXPERTISE

Embedded Systems & Microcontrollers

Development with ESP32/ESP8266, STM32, Arduino, PIC, ATmega, and 8051; experience with LoRa, MQTT, ESP-NOW, RS485, Wi-Fi, and Bluetooth.

Programming & Software

Proficient in C, C++, Python, Verilog; familiar with Arduino IDE, STM32CubeIDE, PlatformIO, Espressif IDF (basic), and Git.

Electronics & PCB Design

Circuit design, PCB layout, prototyping, and soldering; tools: Altium, Fritzing, Proteus, Multisim, PSpice.

3D Modeling & Product Design

3D modeling, rendering, and design using Blender and AutoCAD

Simulation & Instrumentation

MATLAB, GNU Radio; skilled with oscilloscopes, logic analyzers, and multimeters.

Muhammad Arbaaz Alam Khan

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PROFESSIONAL PROFILE

A **driven technology graduate** with strong **practical experience in frontend development, application design, blockchain-based solutions, and workflow automation**. Passionate about **building reliable, user-focused digital products** that **solve real**
problems and add measurable value to businesses. Looking to begin a professional career in an environment that **encourages learning, ownership, and the development of impactful software solutions**.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 2.8 (4)

INTERNSHIP EXPERIENCE

Webspark Studios

30-Jun-2025 - 03-Sep-2026

Software Development Intern Developed a cross platform desktop application using Electron.js and TypeScript designed for real-time speech-to-text transcription. Built functionality to capture live audio and instantly transcribe speech into the currently focused application, enabling hands-free text input. Implemented a transcription history system allowing users to view, manage, and replay past transcriptions along with their corresponding audio. Designed a search and quick-paste feature that enables users to retrieve and insert previous transcriptions using custom keyboard shortcuts, improving productivity and workflow e**ffi**ciency. Collaborated on application structure, performance optimization, and user experience improvements to ensure smooth and reliable operation.

FINAL YEAR PROJECT

Crypto Based Subscription Payment Gateway using our own Token(PAYTKN)

Building a blockchain-based subscription payment platform powered by PAYTKN, a native utility token designed for recurring digital payments. Users can pay subscriptions using USDT, Bitcoin, Ethereum or any digital currency, which are seamlessly converted into PAYTKN and settled with merchants. It will create Liquidity and demand for our token. The platform helps merchants automate subscriptions, reduce payment friction, and access transparent on-chain records, while users gain a simple and flexible way to manage recurring payments. PAYTKN derives value from real usage, enhanced through staking rewards for both users and merchants, and is supported by a treasury model designed to maintain stability and sustainable token growth as platform adoption increases.

TECHNICAL EXPERTISE

Frontend Development

Proficient in building responsive, interactive, and user-friendly web interfaces using HTML, CSS, JavaScript, and modern frameworks. Experienced in translating designs into functional web pages with clean code and optimized performance.

App Development

Skilled in developing cross platform mobile and desktop applications using frameworks like Flutter and Electron.js. Experienced in integrating APIs, implementing smooth UI/UX, and deploying scalable apps for real-world use cases.

Workflow Automation (n8n)

Experienced in designing and implementing automation workflows to streamline business processes. Capable of integrating multiple tools and APIs to automate repetitive tasks, improving productivity and efficiency.

Blockchain Development
Handson experiencewithsmart contract development and building Web3 applications. Familiar with deploying token based systems, blockchain based subscriptions, and decentralized payment solutions.

Muhammad Abu Baker

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PROFESSIONAL PROFILE

Electrical Engineering graduate with 1.5+ years of research experience in 6G wireless communication, including channel modeling, data-rate optimization, and intelligent metasurfaces. Strong expertise in deep reinforcement learning for adaptive and environment-aware wireless systems, with hands-on experience in agent interaction, reward design, and performance optimization. Background in embedded system design and chip-level programming, with practical exposure to camera-based computer vision, image acquisition pipelines, and core visual processing algorithms.

EDUCATION

Electrical Engineering

School of Electrical Engineering and Computer Sciences , Islamabad , 3.14 (2026)

INTERNSHIP EXPERIENCE

Information Processing and Transmission(IPT) Lab

31-Mar-2025 - 22-May-2026

Researched 6G network architectures using analytical and simulation approaches, focusing on data-rate optimization, interference management, and intelligent mobile network control using deep reinforcement learning.

System onChip(SoC)Lab

01-Jul-2024 - 31-Aug-2024

Designed and implemented digital logic circuits on DE-series FPGA boards using Verilog, gaining hands-on experience with FPGA tools, HDLs, circuit testing, and optimized digital system integration.

Optical NetworksandTechnologies(ONT)Lab

01-Jun-2025 - 31-Aug-2025

Worked with O-RAN architecture and generated GAN-based RF IQ datasets to train RAN Intelligent Controllers, improving robustness of AI-driven RAN optimization through data augmentation using OTA and emulation methods.

FINAL YEAR PROJECT

Intelligent Control of SIM-Assisted Wireless Networks Using Deep Reinforcement Learning.

Developed a deep reinforcement learning–based control framework for SIM-assisted wireless networks, optimizing metasurface configurations to enhance sum-rate, spectral efficiency, and adaptive signal propagation under dynamic channel conditions for next-generation communication systems.

TECHNICAL EXPERTISE

Language

Python, C++/C, Java, MATLAB, Verilog

API and Libraries

Pandas, Numpy, Scikit-learn, Pytorch, Tensorflow, OpenCV

Design and Simulation Tools

ModelSim, Proteus, LTspice, MATLAB/Simulink, LabView, Arduino IDE

Ahmed Jamil

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PROFESSIONAL PROFILE

Electrical Engineer specializing in embedded systems and semiconductor design, with hands-on experience in chip design and verification. Strong focus on applying AI techniques within embedded environments to build e**ffi**cient, intelligent, and hardware-aware solutions.

EDUCATION

BEE (Electrical Engineering)

School of Electrical Engineering and Computer Sciences (SEECS) , Islamabad , 3.3 (4)

INTERNSHIP EXPERIENCE

ChipXprt

09-Jun-2025 - 11-Jul-2025

Worked on the processor core design and Verification

System OnChips(SoC)Lab

14-Jul-2025 - 22-May-2026

Working on Risc - V Neuromorphic Accelerator for Low power Surveillance.

FINAL YEAR PROJECT

Risc V Based Neuromorphic Accelerator for Spiking Neural Networks

This project focuses on the design and implementation of a RISC-V based neuromorphic accelerator specifically optimized for Spiking Neural Networks (SNNs). Spiking neural networks are inspired by the way biological neurons communicate using discrete spikes, making them highly energy-e**ffi**cient and suitable for real-time and edge-based intelligent systems. The proposed system integrates a lightweight RISC-V processor with a custom neuromorphic accelerator to e**ffi**ciently handle spike-based computation, neuron updates, and synaptic weight processing. While the RISC-V core manages control flow and general operations, the accelerator is responsible for parallel spike processing, reducing execution latency and power consumption compared to conventional CPU-based implementations. The project explores neuron models, spike encoding, and event-driven computation, and evaluates the system in terms of performance, scalability, and energy e**ffi**ciency. The final implementation can be validated through simulation and/or FPGA prototyping, demonstrating how open-source RISC-V architectures can be extended for emerging AI workloads such as neuromorphic computing. This work highlights the potential of combining open-source hardware with brain-inspired computing to build efficient and adaptable AI accelerators for future embedded and edge applications.

TECHNICAL EXPERTISE

Vivado

Proficient in using Xilinx Vivado for FPGA design, synthesis, implementation, and timing analysis. Experienced in developing and debugging Verilog/SystemVerilog designs, integrating IP cores, running simulations, and generating bitstreams for FPGA-based prototyping and validation.

Verilator

Hands-on experience using Verilator for high-speed simulation and verification of SystemVerilog and Verilog designs. Skilled in converting RTL designs into cycle-accurate C++ models for functional validation, performance analysis, and debugging of hardware modules. Familiar with testbench integration, wavefor ...

RTOS

Experience working with real-time operating systems for embedded systems, including task scheduling, inter-task communication, and synchronization mechanisms. Familiar with implementing time-critical applications, managing interrupts, and optimizing system responsiveness on resource-constrained hardware.

Muhammad Ashar Javid

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PROFESSIONAL PROFILE

Electrical Engineering student and researcher specializing in next-generation wireless communications, with a focus on Reconfigurable Intelligent Surfaces (RIS) and 6G networks. Proven track record of high-impact research, including an accepted paper at IEEE WCNC 2026 and an international research internship through MITACS Globalink. Expertise in integrating Large Language Models (LLMs) and Agentic AI into wireless frameworks to optimize network performance. Conducting research on the intersection of quantum-native communication and intelligent signal processing.

EDUCATION

Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 3.6 (2026)

INTERNSHIP EXPERIENCE

University ofAlberta,Canada

09-Jun-2025 - 31-Aug-2025

1. Leveraged geometric deep learning to analyze non-Euclidean seismic data across distributed sensor arrays. 2. Processed large-scale geophysical datasets to identify precursor patterns often missed by traditional linear models. 3. Worked in a high-stakes research environment at UAlberta, honing technical communication and cross-functional problem-solving skills.

FINAL YEAR PROJECT

Realtime RIS Optimization for 6G networks using Multi Agent Framework

The era of 6G requires technologies like RIS, NOMA and Backscatter for ultra-reliable latency aware systems with data rates approaching terabytes per second. Such technologies require e**ffi**cient management of resources in dynamic and ever evolving environments. Traditional statictical techniques and DRL based schemes are specialised for singular kind of optimization however require heavy computational resources to cater for a dynamic environment. We propose a LLM-reasoning based multi-agentic technique MAFRO working through semantic communication using ACPN for e**ffi**cient resource management in next generation wireless networks achieving high level of fairness and energy efficiency.

TECHNICAL EXPERTISE

Intelligent Systems & Advanced Signal Processing

Expertise lies at the intersection of traditional engineering and frontier artificial intelligence, specializing in the fusion of signal processing with Multi-Agentic AI frameworks. By leveraging Large Language Models (LLMs) to enhance decision-making and autonomous coordination, I develop robust solutions fo ...

Hamza Ahmad

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PROFESSIONAL PROFILE

Motivated Electrical Engineering undergraduate with strong foundations in computer architecture, digital design, FPGA-based systems, and AI-assisted hardware verification. Experienced in hands-on hardware/software development through multiple internships and projects. Skilled in SystemVerilog, Verilog, RTL design, embedded systems, and ML/DL, with a proven track record of delivering technically rigorous projects. Adaptable, detail-oriented, and driven to apply innovative solutions in advanced digital systems and semiconductor environments.

EDUCATION

B.E. Electrical Engineering

School of Electrical Engineering and Computer Science(SEECS) , Islamabad , 3.70 (2026)

INTERNSHIP EXPERIENCE

Nationa l ElectronicsComplexOfPakistan(NECOP)

24-Jun-2025 - 23-Sep-2025

• Conducted research and literature review on indigenous FPGA architectures and development flows, gaining hands-on experience with the OpenFPGA toolchain. • Designed, simulated, and debugged 250+ digital circuits using Verilog/SystemVerilog, leveraging AMD Vivado and Cadence Xcelium, subsequently generating configuration bitstreams for hardware testing. • Analyzed FPGA netlists and architectural constraints to investigate and resolve configuration and bitstream mismatches. • Designed and implemented an RTL-based JTAG interface from scratch; simulated, integrated, and validated it within the top-level FPGA design in Vivado. • Worked closely with verification teams to validate FPGA designs and improve design–verification integration workflows.

Pakistan MinistryofRailways

29-Jul-2024 - 12-Aug-2024

• Gained practical exposure to electrical subsystems in diesel-electric train engines, including control panels, power distribution, and engine room operations. • Observed maintenance, testing, and fault diagnosis procedures across multiple departments, developing an understanding of large-scale electrical systems and operational constraints.

M-Labs (MindstormStudios)

07-Jun-2024 - 12-Aug-2024

• Contributed to a small team-based software development project using C# within the Unity environment, gaining experience in collaborative development workflows and rapid prototyping.

Systems Limited

19-Jun-2023 - 25-Jul-2023

• Supported internal IT operations by configuring and maintaining employee workstations and resolving day-to-day technical issues in a corporate environment.

Eden College

01-Jun-2022 - 01-Jun-2023

• Assisted with grading and small-group tutoring for pre-university physics courses.

FINAL YEAR PROJECT

VeriLLM: LLM-Accelerated UVM Testbench Development

Designing and building VeriLLM, a system that bridges the gap between Generative AI and Hardware Verification. Addressed the industry bottleneck of time-consuming boilerplate code by creating a tool that accepts natural language specifications and outputs complete, compile-ready UVM class hierarchies. The system aims to successfully automate the creation of components like APB monitors and drivers, demonstrating the potential of LLMs to accelerate digital design verification workflows.

TECHNICAL EXPERTISE

HDL & Computer Architecture

SystemVerilog, Verilog, RISC-V Assembly, UVM (Universal Verification Methodology), Verilator.

Embedded Systems & Firmware

C, C++, FreeRTOS, STM32CubeIDE, TouchGFX, Mbed Studio, Arduino, UART/I2C/SPI/AXI Protocols.

FPGA & EDA Tools

AMD Vivado, Intel Quartus, Cadence Xcelium, KiCad (PCB Design).

AI & Data Science

Python, TensorFlow, Keras, TensorFlow-Lite, Scikit-learn, OpenCV, NumPy, Pandas, SciPy, Matplotlib, PIL.

Simulation & Engineering

MATLAB, Simulink, NI Multisim, OrCAD (PSpice), Proteus, Code Composer Studio, NI LabVIEW, LVDAC EMS (Lab-Volt).

Minahel Ahsan

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PROFESSIONAL PROFILE

Motivated electrical engineering undergraduate with a strong foundation in analog and mixed-signal IC design, digital system design, biomedical signal acquisition, and applied machine learning and computer vision applications. Experienced in CMOS circuit design and simulation using Cadence Virtuoso, with familiarity in HDL-based digital design methodologies and system-level design flows. Additionally, has practical exposure to machine learning and computer vision techniques. Strong in project coordination, technical documentation, and collaborative work in research-driven and industry-oriented environments.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3.16 (2026)

INTERNSHIP EXPERIENCE

TechnoSofts

13-Jun-2024 - 13-Jul-2024

Assisted in project planning and execution by coordinating scheduling, resource allocation, and stakeholder communication, ensuring effective collaboration.

NUST Chip Design Centre

10-Jun-2025 - 29-Aug-2025

Designed and implemented a 65 nm CMOS OTA in Cadence Virtuoso, performed simulations for functionality, and documented design flow and results.

FINAL YEAR PROJECT

Analog Front-End for EEG Signal Acquisition in Neurofeedback Therapy

Aims to design and implement a low-noise 65 nm CMOS analog front-end (AFE) for EEG signal acquisition, incorporating chopper stabilization, DC offset suppression, and impedance boosting techniques to achieve low-noise, high-fidelity signal acquisition for neurofeedback therapy applications.

TECHNICAL EXPERTISE

Cadence Virtuoso

Experience with schematic design, transient/AC/DC analysis, noise analysis, and performance evaluation

AI and Machine Learning

-CNNs, MediaPipe Face Mesh pipeline, Haar Cascade, Feature Extraction, Signal and Image-based classification, Diffusion-based Generative Methods and Representation Learning, Performance Optimization Evaluation. -Frameworks & Libraries: PyTorch, TensorFlow/Keras, OpenCV, NumPy, Pandas, Scikit-learn, Matplotli ...

Embedded System and Hardware Design

-Embedded Platforms & Development Boards ESP32, Arduino Uno, STM32 Discovery Boards -Programming Languages Embedded C / C++, SystemVerilog -EDA, Development & Simulation Tools Quartus, STM32CubeIDE, Arduino IDE

Abdullah Munir

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at NUST with a specialized focus on Artificial Intelligence, Machine Learning, and Computer Vision. Proven track record in developing industrial-grade AI modules, including a 2-step KYC verification system and real-time 3D object detection systems. Experienced in robotics and control systems through internships at the National Centre of AI, complemented by strong proficiency in Python, C++, and MATLAB.

EDUCATION

Electrical Engineering

School Of Electrical Engineering And Computer Sciences (SEECS), NUST , Islamabad , 3.22 (2026)

INTERNSHIP EXPERIENCE

Nationa l CentreofArtificialIntelligence(NCAI),NUST

01-Jun-2024 - 14-Aug-2024

• Successfully assembled a mobile robot during my 3-months internship at NCAI. • Integrated object avoidance on said robot. • Successfully optimized PID control systems. • Further fine tuned velocity and directional controllers using Zeigler-Nichols PID Method. • Basic understanding of Linux, Robot Operating System (ROS) 1&2.

Electronic SystemDesignAutomationCentre(ESDAC),NUST

20-Jun-2024 - 31-Aug-2024

• I did a 3-months internship in Silicon Photonics, during which for 2 weeks I was under direct mentorship of Professor Gonzalo Peres, who came to NUST to teach from the University of Malaga, Spain. • During this internship, I got hands on experience with FEXEN, which is a MATLAB extension for silicon photonics manufactured by engineers in Spain. • Thoroughly understood the working principles of silicon photonics, e**ff**ects of light on di**ff**erent materials of various dimensions. • Successfully designed a Mach Zehnder Interferometer using FEXEN. • Successfully designed a focusing-lens to converge all power of light to an optical fibre. • Optimized a 2x2 MMI for maximum power transfer. • Detailed work on Directional Couplers in silicon photonics. • Studied Characteristics and behaviours of waveguides of different types.

Xflow PvtLtd.,I-9

01-Jul-2025 - 25-Jan-2026

• Researched on a variety of commercial AI tools and learned to use them on industrial projects. • Developed an AI automated 2-step KYC self-verification module with facial verification, deepfake and liveness detection, OFAC and UN sanction filtering. • Researched on various international messaging and calling tools, and learned to use tools like Twilio. • Developed the front-end of the KYC mobile-app and web-interface using Figma. • Learned about and implemented secure gateways, application stress testing, API development, etc. • Overall learned a variety of industrial-significant skills and gained hands-on experience on real-life industrial company projects.

FINAL YEAR PROJECT

Edge DPI on Raspberry Pi for Real-Time Anomaly Detection in SDN-Enabled IWSNs

This final year project (FYP) focuses on developing a AI-driven Deep Packet Inspection (DPI) system for real-time anomaly detection in Industrial Wireless Sensor Networks (IWSNs) integrated with Software-Defined Networking (SDN). IWSNs are critical for industrial automation but vulnerable to cyber threats and failures. The project incorporates federated learning, utilizing Raspberry Pi devices as nodes, where each node hosts a local AI model and DPDK-accelerated DPI engine, connected to a centralized server for global

model aggregation. This enhances detection of known and unknown anomalies while optimizing resource use in constrained environments. The system integrates with SDN for dynamic policy enforcement, improving resilience, adaptability, and threat mitigation in industrial settings.

TECHNICAL EXPERTISE

Multi-disciplinary technical Expertise

Programming & Software: Python, C++, Verilog, Assembly, MATLAB, Arduino. AI & Computer Vision: YOLO, DepthAnything V2, Kalman Filters, OCR, MSER, LLM Prompt Engineering. Engineering & Robotics: PID Optimization (Ziegler-Nichols), ROS 1&2, Circuit Design (PSpice/LTSpice), Silicon Photonics (FEXEN). ...

Amna Siddiqui

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PROFESSIONAL PROFILE

Machine Learning and AI Engineer specializing in secure, scalable, and production-ready intelligent systems with strong DevOps and MLOps integration. Experienced in building end-to-end ML pipelines including data ingestion, model training, evaluation, containerized deployment, and CI/CD automation. Strong expertise in Python, LLM-based systems, computer vision, and AI-driven security solutions optimized for performance, scalability, and reliability.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 2.21 (2026)

INTERNSHIP EXPERIENCE

ForthLogicAI - MachineLearningEngineer

12-Jul-2025 - 22-Jan-2026

Built and deployed a Dockerized AI-powered university search engine chatbot using FastAPI for scalable semantic search and real-time inference. UniBot: Implemented LLM-based RAG pipelines using embeddings and vector search to deliver accurate, context-aware responses. BuzzBreach: Developed an end-to-end computer vision pipeline for satellite image analysis using CNNs and integrated results into an AI chatbot system. CHATLEY: Deployed production-grade ML APIs using Docker, REST services, and CI/CD pipelines for automated and reliable model serving. VAPI: Engineered Chatley, an LLM chatbot with fine-tuning, embedding generation, and real-time inference capabilities. Fuddi: a computer vision application using CNN-based image classification with full preprocessing and deployment workflows. n8n: Automated end-to-end ML workflows using n8n for data pipelines, model execution, and API orchestration.

CentreforAdvancedResearchinEngineering(CARE) - AI/MLIntern

15-Jun-2024 - 15-Sep-2024

Implemented ML-based anomaly detection systems for fraud and spoofing in secure communication pipelines. Developed RSA-encrypted APIs with ML-assisted intrusion monitoring mechanisms. Built feature engineering pipelines and optimized classifiers for security datasets. Worked on secure model deployment practices and encrypted ML inference workflows.

ONT-SDN Lab(SEECS)ResearchIntern

05-Jun-2025 - 05-Sep-2025

• Applied ML models for real-time traffic anomaly detection in SDN simulations. • Built streaming ML pipelines using Redis Pub/Sub for real-time data ingestion and prediction. • Integrated blockchain-secured ML logging using Hyperledger Fabric for immutable network event validation. • Optimized network-security ML systems for scalability and low-latency deployment.

FINAL YEAR PROJECT

Federated Learning IoT Security (FYP)

Designed federated ML models for IoT anomaly detection with local training, secure aggregation, and API integration.

TECHNICAL EXPERTISE

TECHNICAL SKILLS

ML/AI: n8n, Scikit-learn, TensorFlow, PyTorch, XGBoost, Autoencoders, Computer Vision (OpenCV, CNNs) MLOps & Deployment:

Model Serving, CI/CD for ML, Docker, Kubernetes, Streamlit, FastAPI, Flask, AWS (EC2, S3), Redis Data & Tools: SQL (PostgreSQL), MongoDB, Data Preprocessing, PCA, Pandas, NumPy, Matpl ...

PROJECTS

Federated Learning IoT Security (FYP) Designed federated ML models for IoT anomaly detection with local training, secure aggregation, and API integration . Chatley– LLMChatbot Built LLM-powered chatbot with fine-tuning, embeddings, dataset integration, and scalable inference APIs. Fuddi Computer ...

RESEARCH EXPERIENCE

AI Security for 6G IoV (2025) Developed federated ML models using Stackelberg game formulation for intelligent vehicular threat detection and AI-driven security. Secure Communication in UWSNs (IET Book Chapter, 2024–2025) Designed AI-enhanced trust management systems and cryptographic models for secure u ...

Sarah Omer

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PROFESSIONAL PROFILE

Final year Electrical Engineering student with a strong interest in embedded systems, real-time sensing, and edge computing. I have hands-on experience in developing monitoring and automation solutions through academic projects and internship exposure, involving sensor integration, hardware-level control, and on-device data processing. My technical skill set includes embedded C/C++, Python, microcontroller-based system design, and the use of hardware simulation and debugging tools.

My Final Year Project, "A Communication System that Monitors Blood Glucose Levels for Type II Diabetics", demonstrates my ability to design practical, real-time monitoring systems with reliable data communication. My overall project experience reflects applications in smart healthcare, alongside exposure to agricultural monitoring and secure system environments. I am motivated to begin my professional career in engineering roles centered on embedded development, edge-based processing, and practical real-time system implementation, where I can contribute to building dependable and scalable technology solutions.

EDUCATION

Bachelors in Electrical Engineering

School of Electrical Engineering and Computer Sciences (SEECS) , Islamabad , 3.64 (2026)

INTERNSHIP EXPERIENCE

Jazz

11-Jul-2024 - 05-Sep-2024

Completed a technical internship at Jazz in the Cybersecurity Department, focusing on vulnerability management, secure access, and system hardening. Implemented patches for Chrome, VMware, and Wireshark using Remote Desktop Protocol (RDP) through Kron Tech's Privileged Access Management (PAM) solution. Patched and maintained AMT Jumpservers to enhance system security. Verified and managed Single Sign-On (SSO) portals provided by Exceleron using built-in RDP in a Citrix environment, including functionality testing of portals without proxy or frontend. Conducted research on cybersecurity threats such as birthday attacks, Trojans, and Windows SMB v1 vulnerabilities. Delivered technical presentations on PAM, IAM, PAM deployment on non-human entities, and Operational Technology (OT) security in relation to electrical systems. Redesigned and updated the PAM solution presentation using Canva under team guidance. Contributed to enterprise-level cybersecurity practices involving secure remote access, vulnerability mitigation, and documentation of cybersecurity frameworks.

FINAL YEAR PROJECT

A Communication System that Monitors Blood Glucose Levels for Type-II Diabetics

"A Communication System that Monitors Blood Glucose Levels for Type-II Diabetics" is a non-invasive health monitoring solution designed to track glucose levels without the need for finger-prick testing. The system utilizes near-infrared (NIR) spectroscopy, employing an IR LED and the TSL2591 optical sensor to analyze light absorption characteristics related to glucose concentration. The device is designed in an oximeter-like form factor for ease of use and continuous monitoring. Collected data is processed and transmitted to a dedicated mobile application, SBS, which enables real-time monitoring and automatically alerts an attendant if the patient's blood glucose level exceeds safe thresholds. The project focuses on improving patient comfort, enabling timely intervention, and demonstrating the integration of sensing, embedded processing, and communication in smart healthcare systems.

TECHNICAL EXPERTISE

Embedded Systems & Edge Intelligence

I have strong technical expertise in embedded systems, real-time sensing, and edge-level computing, with hands-on experience in

system design, sensor integration, and on-device data processing. My work involves microcontroller-based development using embedded C/C++ and Python, along with real-time signal acqu ...

Embedded Systems, IoT & Edge Computing

I have strong technical expertise in embedded systems, real-time sensing, and edge-level computing, with hands-on experience in system design, sensor integration, and on-device data processing. My work involves microcontroller-based development using embedded C/C++ and Python, along with real-time signal acqu ...

Aized Soban

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate with hands-on experience in digital design, RISC-V processor architectures, and hardware

verification.Currentlyworkingpart-timeat**Xcelerium(sinceNov2025)**on**CVA6coreinstructiontracingand UVM-based logic**

trace verification, with exposure to real-world RTL debugging and verification workflows. Previously trained at **National Chip Design Centre (NCDC), NUST**, where I designed and verified a 5-stage pipelined RISC-V processor and worked on cache architectures, hazard resolution, and SystemVerilog testbenches. Strong interest in semiconductor design, processor microarchitecture

EDUCATION

BEE

SEECS , Islamabad , 3.28 (2022)

INTERNSHIP EXPERIENCE

Xcelerium | Nov2025–Present

01-Nov-2025 - 25-Jan-2026

Part-Time Hardware Verification Engineer Working on instruction-level and logic trace verification for the CVA6 RISC-V core. Integrating and analyzing execution traces to validate core behavior against expected instruction flow. Developing and executing UVM-based verification tasks focused on trace correctness and corner cases. Debugging RTL and simulation mismatches using waveform analysis and trace comparison. Gaining hands-on exposure to industry-grade verification workflows and large-scale RTL codebases.

Nust ChipDesignCentre(NCDC)

01-Feb-2025 - 31-Aug-2025

Intern Trainee – Digital Systems & RISC-V Architecture Designed and verified a 5-stage pipelined RISC-V processor supporting RISBUJ instruction formats. Implemented pipeline hazard handling including data forwarding, stalling, and branch control. Developed SystemVerilog testbenches and performed functional verification using ModelSim. Studied cache memory organizations (direct- mapped, set-associative) and performance trade-o**ff**s. Contributed to architectural exploration for a dual-core SMP processor with MESI-based cache coherence as part of an ASIC tape-out track.

FINAL YEAR PROJECT

ASIC Tape-out of Dual-Core SMP RISC-V Processor with MESI-Based Cache Coherence

Working on the architectural design and simulation of a dual-core symmetric multiprocessing (SMP) RISC-V processor targeting ASIC tape-out. Developing a cache hierarchy implementing the MESI coherence protocol to ensure correct shared-memory operation across cores. Using gem5 for architectural simulation and performance evaluation under parallel workloads. Analyzing interconnect design, coherence controllers, and memory access behavior. Evaluating system-level performance trade-o**ff**s related to cache organization, coherence traffic, and scalability.

TECHNICAL EXPERTISE

Digital Design & Hardware Verification

Hands-on experience in RISC-V processor design and verification, including pipelined microarchitectures, hazard resolution, and cache subsystem concepts. Actively working on instruction and logic trace verification for the CVA6 core using UVM methodologies, with strong exposure to RTL debugging and waveform-b ...

Programming & HDL Languages

ProficientinVerilogandSystemVerilog for RTL design and verification, with practical use of C/C++ and RISC-V assembly for low-level software interaction. Familiar with Tcl scripting for EDA tool automation and build flows.

Computer Architecture

Solidunderstandingof RISC-V ISA, SMP systems, cache hierarchies, and MESI-based cache coherence. Experience evaluating architectural trade-offs through simulation and performance analysis.

Verification, Simulation & Toolchains

Experience withUVM-based verificationenvironments, SystemVerilog testbenches, and instruction trace analysis. Skilled in using ModelSim, Vivado, Quartus, and gem5 for design verification, simulation, and architectural exploration.

Abdullah Mir

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PROFESSIONAL PROFILE

Embedded Systems and Digital Design enthusiast with hands-on experience in C/C++, microcontrollers (STM32, ESP32, Arduino), and FPGA-based hardware accelerators. Worked on post-quantum cryptography (ASCON) accelerators, CPU design in SystemVerilog, and real-time embedded projects using sensors and communication protocols. Strong in self-learning, documentation, and explaining complex concepts to others.

EDUCATION

Electrical engineering

seecs , Islamabad , 3.0 (2022)

INTERNSHIP EXPERIENCE

SOC lab/Nstp/NUSt

01-Apr-2025 - 14-Jan-2026

• Worked on hardware accelerators for PQC (ASCON-128), focusing on side-channel resistance and secure hardware for embedded systems. • Verified ASCON in C using NIST vectors and integrated with FPGA flow (Vivado/Quartus). • Designed simple CPU in SystemVerilog (ALU, regfile, decoder, control), verified via RTL simulation & synthesis. • Exposure to ASIC flow – floorplanning, STA, PPA trade-offs. • Performed literature review and contributed to research publication.

SDAC, EmbeddedSystemsResearchLab–NUST

01-Jun-2024 - 01-Aug-2024

• Built FPGA-based solutions on DE1-SoC integrating ARM Cortex-A9 with custom logic for embedded applications. • Developed Linux kernel modules/character drivers for custom peripherals using file ops & ioctl. • Interfaced sensors & peripherals using C/C++ with interrupts, polling, and MMIO. • Worked with UART, SPI, I2C; debugged using logs & test utilities.

QKZEE Technologies

01-Apr-2023 - 01-Sep-2023

• Assembled and tested electronic circuits using soldering, PCB design workflows, and Proteus simulations, supporting academic and IoT-based hardware projects. • Developed microcontroller-based prototypes on Arduino, ESP32, and Raspberry Pi, integrating ultrasonic, IR, temperature, humidity, gas, and motion sensors. • Implemented power regulation and switching circuits using MOSFETs, BJTs, voltage regulators, capacitors, and batteries ensuring safe and stable device operation. • Debugged hardware issues including noisy signals, incorrect pin mapping, unstable power, and coding errors.

FINAL YEAR PROJECT

sharp: secure hardware accelerator for post quantum cryptography algorithms

This Final Year Project focuses on the design and implementation of SHARP (Secure Hardware Accelerator for Post-Quantum Cryptography), a dedicated cryptographic accelerator targeting ASCON-128a, a NIST-standardized lightweight post-quantum cryptographic algorithm. The objective of SHARP is to enable secure, e**ffi**cient, and side-channel-resistant communication for resource-constrained IoT and embedded systems in the post-quantum era. The project explores and evaluates three architectural approaches for ASCON-128a implementation: single-cycle, multi-cycle, and pipelined architectures, with a detailed analysis of power, performance, and area (PPA) trade-o**ff**s. Based on these evaluations, a potential hybrid architecture is being investigated to further optimize e**ffi**ciency while maintaining security guarantees. A strong emphasis is placed on hardware-level side-channel resistance, ensuring robustness against physical attacks such as power analysis. The final deliverable is a synthesizable chip-level design suitable for integration into IoT platforms, enabling secure communication in the quantum computing era. Currently, the SHARP

accelerator has achieved an efficiency of 2.49%, surpassing the 2.44% efficiency reported in the latest published research. Ongoing efforts focus on further architectural optimizations, improving efficiency, and refining results for research publication.

TECHNICAL EXPERTISE

Technical Skills

• Languages & Firmware: C (embedded), C++, Python, Assembly • Core Embedded Concepts: Pointers, bitwise operations, memory-mapped I/O, interrupts, FSM design • Microcontrollers & Embedded Platforms: STM32 (basic), ESP32, Arduino, Raspberry Pi, DE1-SoC (ARM Cortex-A9 + FPGA) • Protocols & Peripherals: UAR ...

Adeeba Wazir

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate at NUST with a strong academic background and hands-on experience in FPGA design, embedded systems, and processor architecture. Experienced in RISC-V design, error-correcting codes, and digital signal processing through research and lab work. Highly motivated to apply theoretical knowledge to real-world engineering problems and continuously develop technical and research skills.

EDUCATION

Bachelors in Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 3.72 (2022)

INTERNSHIP EXPERIENCE

System OnChipLab,SINES,NUST

24-Jun-2024 - 30-Nov-2025

Learned fundamentals of FPGA design and VGA port programming Working on the implementation of a 32/64-bit Floating Point Digital Signal Processor Involved in processor architecture and hardware design research Worked on the design and understanding of RISC-V processors

FINAL YEAR PROJECT

Autonomous Drone interceptor with Vision-based target capture

An autonomous aerial system designed to detect, track, and intercept a moving target using real-time computer vision. The drone employs onboard vision algorithms for target identification and localization, enabling autonomous navigation, pursuit, and capture without human intervention. The system integrates vision-based perception, control algorithms, and embedded processing to achieve accurate and efficient target interception.

TECHNICAL EXPERTISE

RTL Design and FPGA Programming

Experienced in RTL design using Verilog for implementing combinational and sequential digital systems, including FSMs and datapath/control logic. Hands-on experience in FPGA programming with Quartus, covering design synthesis, implementation, timing analysis, and hardware debugging for processor and signal pr ...

Muhammad Zakwaan

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PROFESSIONAL PROFILE

Hardworking electrical engineering student with strong concepts in "Control Systems" and "Robotics". In addition, keen interest in learning machine and deep learning concepts.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3.47 (4)

INTERNSHIP EXPERIENCE

NECOP(NESCOM)

14-Jul-2025 - 08-Sep-2025

Digital Design tasks on "Arty A7", i.e. simple calculator design etc.

FINAL YEAR PROJECT

Visual Drone Tracking

Making a drone (maybe extenden to drone swarm) that would detect and track enemy drones, using computer vision models (v11).

TECHNICAL EXPERTISE

Haseeb Umer

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student with hands-on experience in RTL design, functional verification, and embedded systems development. Proficient in SystemVerilog, C/C++, Python, and Makefile-based automation for both hardware verification and firmware workflows. Experienced with RISC-V-DV, Spike, and QuestaSim for ISA-level and RTL-level verification, along with STM32- and ESP32-based microcontroller platforms for real-time embedded applications. Strong foundation in RISC-V architecture (RV32IMCF), digital logic, peripheral interfacing, and coverage-driven test planning. Analytical and detail-oriented with a strong passion for VLSI design, verification methodologies, and embedded–hardware co-design.

EDUCATION

BE Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 2.98 (2026)

INTERNSHIP EXPERIENCE

NUST Chip Design Centre

10-Feb-2025 - 29-Aug-2025

During my internship, I designed a 32-bit RISC-V processor datapath and control logic using SystemVerilog, where I implemented complex FSM operations and register transfer logic. I ensured design reliability by achieving 100% functional coverage through simulations in ModelSim and performed detailed timing and synthesis constraint analysis using Quartus and Vivado. Additionally, I gained experience in the hardware-software interface by performing low-level debugging and memory analysis for C-based embedded implementations using GDB and Valgrind, ensuring high-quality, stable code execution.

FINAL YEAR PROJECT

Performance Enhance Implementation of RISC-V Vector Extension

This project optimizes the RISC-V Vector (RVV) Extension to overcome performance bottlenecks in the vector core. By replacing sequential processing with a multi-lane parallel architecture and optimizing the Load-Store Unit (LSU), we significantly enhanced data throughput for AI and DSP workloads. Following rigorous RTL verification via QuestaSim and Verilator, the resulting high-performance coprocessor maximizes data-level parallelism for modern, high-efficiency SoC environments.

TECHNICAL EXPERTISE

EDA & Simulation Tools

Hands-on experience with Vivado, Quartus, Cadence Xcelium, QuestaSim, ModelSim, and Verilator for synthesis, simulation, and debugging.

Hardware Description Languages (HDLs)

Proficient in SystemVerilog, Verilog, and Assembly Language for digital design and low-level system implementation.

Digital System Design

Expertise in RTL design, finite state machines (FSMs), ALU development, datapath and control units, clock division, and debouncing circuits.

Verification & Validation

Skilled in functional and formal verification, RISC-V DV flows, test planning, and assertion-based verification.

Programming Languages
StrongcommandofC,C++,andPython for embedded development, automation, and analysis.

Design Methodologies
Familiar with UVM concepts and environments. Instruction Set Architecture Coverage (ISAC) methodologies for structured verification

Data Analysis Tools
ExperienceusingSPSS,AMOS, SmartPLS, and RStudio for statistical analysis and research validation.

Circuit Simulation & Design
ProficientinProteus,Multisim,andPSpice for electronic circuit modeling and testing.

Embedded Systems & Firmware Development
Expertisein C/C++andEmbeddedCprogrammingfor STM32, ESP32, and Arduino platforms, including peripheral interfacing via UART, GPIO, and I2C using STM32CubeIDE, CubeMX, HAL, and TouchGFX.

IoT Integration
Experiencebuildingconnected systems using MQTT, Node-RED, and ThingSpeak

Ali Masood Khan

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PROFESSIONAL PROFILE

The rise in Edge computing and localized calculation has sparked my interest in developing optimized hardware accelerators, GPUs and memory systems. I intend to excel in the industry and gain valuable insight and experience to develop better IPs and solutions by use of my cognitive and social abilities.

EDUCATION

BS Electrical Engineering

National University of Sciences and Technology , Islamabad , 3.42 (2026)

INTERNSHIP EXPERIENCE

NUST CHIP DESIGN CENTER

19-Feb-2025 - 25-Sep-2025

• Implemented a Fire Detection FSM after learning about procedural blocks, Enumerations and Design Hierarchy. Introduced to configurable design using parameters. • Learned how to inspect and debug memory, solve stack errors and segmentation faults, analyze core dumps using GDB for Linux. • Worked on RISC-V based ISA and implemented sorting algorithms in assembly using venus. • Built a single cycle RISC-V32I processor and then pipelined it, which later required hazard handling. The processor was able to run Machine code without hindrance. • Wrote testbenches to verify top and hidden modules in projects. • Thorough review of computer architecture and C programming.

PAKISTAN ORDNANCE FACTORIES

01-Aug-2024 - 01-Sep-2024

• Worked in the Drawing office and calculated load and cable requirements for a neighborhood in Wah Cantt. • Learned how to read Elecrical drawings and use AutoCAD. • Gained insightful experience on how an organization runs itself. Observed maintenance and improvement of a system using PLCs.

ELECTRONIC SYSTEMDESIGNAUTOMATIONCENTER,NUST

03-Jun-2024 - 31-Jul-2024

• Bare metal programming on DE-10 SoC board. • Ran Linux kernel on the HPS of DE-10 SoC board(ARM Cortex A9.) • Developed Linux applications that communicate with FPGA hardware including kernel and character drivers and I/O peripherals like accelerometer. • Other tasks included running FPGA accelerated DSP algorithms. Made a Canny Edge Detector implementation on the FPGA and used DMA to access images and calculate edges.

FINAL YEAR PROJECT

Design of Real-time 360 degrees image-stitching for Panoramic Vision Systems on FPGA

• The FPGA being used is XC7Z020-1CLG4C featured on the Zybo Z7-20. • Literature Review of image stitching and Feature detection algorithms. • Proposed an customized ORB for feature detection. • Used OpenCV's image stitching algorithms to get compare different techniques. • Built HLS implementations of FAST, rBRIEF • Designed and finalized Micro-architecture for HDL implementation. • Currently working on designing AXI interfaces and Memory Controller for DDR access My contribution includes the interfacing of the modules using AXI and building sub-modules for ORB and gaussian pyramids.

TECHNICAL EXPERTISE

Python and OpenCV

I have used OpenCV and python in various projects. To highlight a few, I have built a Geometric SLAM System using an OAK-D camera. I implemented Visual odometry using Perspective N-Point to estimate the flow of the camera and engineered a dense mapping function using volume integration to generate .ply meshes ...

Systemverilog, Verilog and Digital Design and HLS

I have done an internship and 2 course labs on verilog programming. In this duration, I have learnt how to build FSMs, RISC-V cores and modified those RISC-V cores to add a feature such as UART. I have also verified said core to a golden standard with verilator. My FYP also uses these tools profusely and ther ...

Embedded Systems and SoCs

I have done considerable work on device drivers for embedded Linux running on DE-10 boards, interfacing them with hardware such as VGA, gyroscopes and LEDS. I have made drivers to communicate with hardware on the FPGA and apply sobel filters and canny edge detection algorithms on the input image. I have exper ...

Machine Learning

I have taken online courses on Machine Learning, an example is Andre Ng's course on ML. Deep Learning has also been a part of my coursework. I have built a football analysis and tracking system using YOLO and classification using K-means clustering. I have worked on datasets including MNIST

Analog Biomedical Devices

I also hold a great passion for medical applications of electronics and electrical engineering technology. As such, for a semester project, I built an ECG Machine using analog circuits. The project included the design and calibration of notch filters and Butterworth filters, in Sallen-Key configuration. Low P ...

MATLAB

I have done 3 credit hours worth of lab on matlab. I have designed a filter that detects a earthquake or irregular seismic activity and displays the time for the activity. Due to my work on MATLAB and Signal and Systems, I have acquired an in-depth understanding of signal processing concepts such as the Fouri ...

Mohammad Ali

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PROFESSIONAL PROFILE

lead game designer

creative head parhlai

intern avionic solutions

intern system on chip lab

EDUCATION

electrical engineering
seecs , islamabad

INTERNSHIP EXPERIENCE

avionic solution

18-Jul-2025 - 16-Jan-2026

work on manchester encoder decoder on microcontroller

system onchiplab
07-Nov-2025 - 16-Jan-2026

in memory computing

startify funpulse
07-Nov-2024 - 07-Aug-2025

lead game designer

FINAL YEAR PROJECT

in memory computing
instead of moving data from ram to cpu and then back we are trying to process the data inside the memory

TECHNICAL EXPERTISE

Maheen Abdullah

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student specializing in **digital chip design and RISC-V architectures**, with hands-on experience in

RTL-leveldesign,PCB development,and embedded systems.Activelytrainedat the**NUST ChipDesignCentre(NCDC)** through an intensive, exam-based program covering **C programming, Digital Logic Design, Computer Architecture, and RISC-V**,
with sustained full-time summer and part-time semester engagement. Strong foundation in **VLSI, microprocessor systems, and hardware-software integration**, with proven ability to learn complex systems quickly and deliver under demanding technical environments.

EDUCATION

Bachelors of Electrical Engineering (BEE)

School of Electrical Engineering and Computer Sciences (SEECS) , Islamabad , 3.07 (2026)

INTERNSHIP EXPERIENCE

NUST Chip Design Centre (NCDC)

18-Feb-2025 - 01-Aug-2025

Completed an intensive, structured chip design training program involving labs, vivas, and written examinations. Successfully finished technical modules in C Programming, Digital Logic Design (DLD), Computer Architecture, and RISC-V ISA. Worked 20 hours/week during semesters and 40 hours/week during summer, demonstrating consistency, discipline, and professional commitment. Currently engaged in a Final Year Project on RISC-V Vector Processor Extension, focusing on architectural understanding and RTL-level concepts. Gained exposure to hardware-oriented problem solving, design validation, and systematic debugging.

MINE Lab,NUST

02-Jun-2024 - 31-Aug-2026

Designed and simulated analog and digital PCB layouts using Altium Designer. Performed schematic capture, simulation, and PCB fabrication workflows. Designed and implemented a Battery Overcharge Protection System, fabricated and tested on PCB. Applied concepts from Electronic Devices, Circuit Design, and Power Electronics in real hardware projects.

Graduate ResearchLab,NUST

01-Jan-2025 - 31-Jan-2026

Control Systems Intern Assisted in control system modeling and analysis tasks under research supervision. Gained exposure to research-oriented problem formulation and validation methods. Developed foundational understanding of control system behavior and performance analysis.

FINAL YEAR PROJECT

Design and Implementation of a RISC-V Based Vector Processor

Currently designing and implementing a custom RISC-V vector processor to accelerate data-parallel computations. Developing a parameterized vector ALU with configurable VLEN, SEW, and LMUL, supporting integer vector operations (ADD, SUB, logical operations, MIN/MAX, MAC). Implementing vector control logic, including masking, tail handling, and element-wise execution. Integrating the vector unit with a scalar core using a PCPI-based interface and memory-mapped communication. Verifying functionality through SystemVerilog testbenches, simulation, and waveform analysis in Vivado. Targeting applications in machine learning, AI, and cryptography, with a focus on scalability and performance.

TECHNICAL EXPERTISE

Digital Chip Design & Computer Architecture
Strongfoundation indigital designprinciplesandprocessor architecture, with hands-on exposure to datapath design, control logic, and architectural trade-offs through structured training and project-based work.

RISC-V Architecture & Vector Extensions
PracticalunderstandingoftheRISC-Vinstruction setarchitecture, including ongoing work on vector processor extensions, with focus on performance, scalability, and hardware-level implementation concepts.

Embedded Systems Development
Experiencein developing embeddedsystems using microcontrollers (AVR, ESP32), integrating sensors, actuators, and peripherals with firmware written in C and Arduino-based environments.

Digital Logic Design (DLD)
Strongcommandof combinational and sequential logic, FSMs, counters, ALUs, and timing analysis, reinforced through labs, exams, and practical digital system design projects.

C Programming for Hardware Systems
Proficient in Cprogrammingfor low-levelandhardware-oriented applications, including control flow, memory handling, and interfacing with microcontroller peripherals.

Simulation & Verification Tools
Experienceusingsimulationandanalysistools such as LTSpice, PSpice, Proteus, and Vivado to verify circuit behavior and digital designs before physical implementation.

Technical Problem Solving
Stronganalyticalapproach todiagnosing hardware and system-level issues, with persistence in resolving complex problems through structured debugging and experimentation.

Ameer Hamza

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PROFESSIONAL PROFILE

I'm an Electrical Engineering Final Smester student with focused interests in Control Systems, Power Systems, and PCB design for control- and power-oriented applications. Completed a technical internship at NUST's MiNE Lab, gaining hands-on experience in designing PCBs for feedback-based motor control and balancing systems using Proteus and EasyEDA. Currently working on a Final Year Project that integrates control and power system concepts through a smart road infrastructure with wireless power transfer for electric vehicles.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 2.35 (2026)

INTERNSHIP EXPERIENCE

Micro NanoElectronics(MiNE)Lab

23-Jun-2025 - 22-Aug-2025

During my internship at the Micro Nano Electronics (MiNE) Lab, NUST, I designed and implemented PCBs using Proteus and EasyEDA for control-oriented projects closely aligned with my academic work. I developed PCB designs for a PWM-based motor controller with tachometer feedback and a single-axis ball balancing robot, focusing on controller interfacing, signal conditioning, and stable system response. This hands-on hardware experience directly supports my Final Year Project on a Smart Road system with wireless power transfer for electric vehicles, strengthening my ability to convert control system concepts into practical, real-world hardware solutions.

FINAL YEAR PROJECT

Smart Road with wireless power transfer capabilities for EVs.

This project focuses on the design of an intelligent road infrastructure capable of wirelessly delivering power to electric vehicles using integrated control and power system principles. The work involves modeling and controlling power flow to ensure efficient, stable, and safe wireless energy transfer under varying operating conditions. Emphasis is placed on system-level integration, control strategy development, and hardware-oriented design, reflecting a strong command of both control systems and power engineering for next-generation EV infrastructure.

TECHNICAL EXPERTISE

Advanced Control, Power Systems & Embedded PCB Design

Specialized in designing intelligent control and power systems with hands-on expertise in PCB design using Proteus and EasyEDA. Experienced in developing sophisticated embedded systems and automation projects, including PWM-based motor controllers, single-axis balancing robots, and early fault detection in in ...

Hasan Ahmad

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate with a strong focus on **Digital Logic Design**, **RTL**, and **Embedded Systems**. Proficient in **Verilog** and **FPGA** implementation, with a deep understanding of **Computer Architecture**. Innovative problem solver currently leading the development of an AI-powered tool to automate **UVM testbench generation**, bridging the gap between natural language processing and hardware verification.

EDUCATION

Bachelor of Engineering in Electrical Engineering (B.E. EE)

School of Electrical Engineering and Computer Science (SEECS) , Islamabad , 3.95/4.00 (2026)

INTERNSHIP EXPERIENCE

Nationa l ElectronicsComplexOfPakistan(NECOP)

24-Jun-2025 - 23-Sep-2025

• Conducted research and literature review on indigenous FPGA architectures and development flows, gaining hands-on experience with the OpenFPGA toolchain. • Designed, simulated, and debugged 250+ digital circuits using Verilog/SystemVerilog, leveraging AMD Vivado and Cadence Xcelium, subsequently generating configuration bitstreams for hardware testing. • Analysed FPGA netlists and architectural constraints to investigate and resolve configuration and bitstream mismatches. • Designed and implemented an RTL-based JTAG interface from scratch; simulated, integrated, and validated it within the top-level FPGA design in Vivado. • Worked closely with verification teams to validate FPGA designs and improve design–verification integration workflows.

Pakistan MinistryofRailways

29-Jul-2024 - 12-Aug-2024

• Gained practical exposure to electrical subsystems in diesel-electric train engines, including control panels, power distribution, and engine room operations. • Observed maintenance, testing, and fault diagnosis procedures across multiple departments, developing an understanding of large-scale electrical systems and operational constraints.

M-Labs (MindstormStudios)

07-Jun-2024 - 12-Aug-2024

• Contributed to a small team-based software development project using C# within the Unity environment, gaining experience in collaborative development workflows and rapid prototyping.

Systems Limited

19-Jun-2023 - 25-Jul-2023

• Supported internal IT operations by configuring and maintaining employee workstations and resolving day-to-day technical issues in a corporate environment.

FINAL YEAR PROJECT

VeriLLM: LLM-Accelerated UVM Testbench Development

Designing and building VeriLLM, a system that bridges the gap between Generative AI and Hardware Verification. Addressed the industry bottleneck of time-consuming boilerplate code by creating a tool that accepts natural language specifications and outputs complete, compile-ready UVM class hierarchies. The system aims to successfully automate the creation of components like APB monitors and drivers, demonstrating the potential of LLMs to accelerate digital design verification workflows.

TECHNICAL EXPERTISE

Digital Design, Verification & Architecture

HDL andArchitecture:SystemVerilog, Verilog, RISC-V Assembly, UVM (Universal Verification Methodology), Verilator. EDA Tools: AMD Vivado, Intel Quartus, Cadence Xcelium, Venus Simulator. Protocols: AXI, UART, SPI, I2C.

Embedded Systems & Firmware

Languages:C,C++,Python.Tools&Frameworks: FreeRTOS, STM32CubeIDE, TouchGFX, Mbed Studio, Arduino. PCB Design: KiCad.

AI, Data Science & Simulation

AIStack: TensorFlow,Keras,Scikit-learn, OpenCV, NumPy, Pandas. Simulation: MATLAB, Simulink, NI Multisim, OrCAD (PSpice), Proteus, LabVIEW, Ansys.

Dure Adan Ali Khan

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate with a strong focus on bioelectronics and biomedical signal analysis. Passionate about developing technology-driven healthcare solutions, with particular interest in biomedical applications of bioimpedance, computer vision, and deep learning. Seeking opportunities to further specialize and contribute to innovation in biomedical engineering.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3.41 (2022)

INTERNSHIP EXPERIENCE

Micro NanoElectronicsLab(MiNE)

16-Jun-2025 - 17-Aug-2025

Conducted research on skin bioimpedance characteristics for melanoma detection as a research intern.

FINAL YEAR PROJECT

Skin Impedance Based Melanoma Detection

Focuses on the investigation of bioimpedance-based techniques for melanoma detection using computational modeling. The project involves designing multilayer skin tissue models and performing impedance simulations using COMSOL Multiphysics to study the electrical behavior of biological tissues. The impact of varying electrical properties of skin layers on impedance response is analyzed to support the development of non-invasive biomedical diagnostic approaches.

TECHNICAL EXPERTISE

COMSOL Multiphysics

Experienced in computational modeling and simulation for biomedical applications, with hands-on proficiency in COMSOL Multiphysics for bioimpedance and tissue modeling.

MATLAB

Familiar with MATLAB for numerical analysis and signal processing.

Python and C++ Programming

Practical experience in deep learning programming for biomedical and computer vision applications.

Noumaan Mashood

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PROFESSIONAL PROFILE

Motivated graduate with an intrest in intelligent systems , AI , Computer Vision and Control systems alongside experience in solving problems using engineering tools and combining hardware and software with tools like python , MATLAB , Micro-controllers and Edge Devices. Eager for oppurtunities to contribute in innovative Engineering projects and Artificial intelligence

EDUCATION

BoEE

School of Electrical Engineering and Computer Science , Islamabad , 2.56 (2026)

INTERNSHIP EXPERIENCE

SEECS

01-Jul-2025 - 07-Sep-2025

Drone Flight Stability using Reinforcement Learning The task of internship where to use the concepts of RL to develop a stable flying drone instead of traditional non linear control systems learning more deeply about subject matters of DL.

FINAL YEAR PROJECT

BAYMAX: Your personal health monitor

Creation of a device (inspired by Baymax from Big Hero 6) that would monitor sick and elderly by video and non invasive methods using AI techniques and ML models that are ran on an Edge device for privacy of the medical data of the user and also allows to create alarm if the condition of the patient is critical so the care takers can act accordingly in time, also using a LLM to help interact with the patient so it can allow requests to be sent to the care-giver The project aligns with SDG 3 and 5 and helps in avoidance of deaths due to lack of timely treatment and also helps to free up the limited caregivers. In conclusion a device that would ideally monitor an elderly patient by non invasive methods 24/7 and using privacy measures like using edge devices

TECHNICAL EXPERTISE

Skills and Expertise

Programming & Software MATLAB & Simulink Python (NumPy, Pandas, Matplotlib, basic ML libraries) Arduino (Embedded C) Machine Learning & AI Supervised learning fundamentals Data preprocessing & feature engineering Model evaluation and performance metrics Introductory Computer Vision con ...

Rayyan Naeem Muzaffar

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate with strong full-stack, cloud, and applied AI engineering experience, specializing in building production-grade systems end-to-end. Proven track record of designing and deploying scalable backend platforms, real-time applications, and AI-driven products on AWS, with hands-on ownership of architecture, security, and DevOps. Experienced in applied AI systems including multi-agent orchestration, computer vision, OCR, and voice-based AI, as well as edge and robotics applications such as monocular vSLAM and 3D human pose estimation on resource-constrained hardware. Combines strong software engineering fundamentals with systems-level thinking, hardware integration, and product-driven problem solving.

EDUCATION

Bachelors of Electrical Engineering (BEE)

School of Electrical Engineering and Computer Science (SEECS) , Islamabad , 3.47 (2026)

INTERNSHIP EXPERIENCE

Pakistan AirportsAuthority

16-Jun-2025 - 25-Jul-2025

Understanding and analyzing the electrical network installed in Jinnah International Airport (JIAP), karachi. Including but not limited to: 1. Main power transmissions to JIAP and distribution networks 2. Analysis and study of Ground Power units for ground aircraft powering 3. Analysis and study of various airfield lights and lighting systems

Erly stage Studios

01-Jun-2024 - 01-Jul-2024

1. upgrading and maintaining backend (nestjs) and frontend (reactjs) codebase. 2. creating frontend pages and backend apis 3. implementing advanced auth flows and debugging current security/quality bugs

FINAL YEAR PROJECT

Edge-Deployed 3D Vision and Localization for Autonomous Systems

This project develops an edge-deployed autonomous perception system that combines monocular/stereo 3D vision and visual SLAM for real-time localization and mapping. Using a simulated environment, the system estimates vehicle pose and reconstructs surrounding structure without GPS or depth sensors. Vision-based perception modules enable human detection and collision-aware navigation. Designed for resource-constrained edge platforms, the system emphasizes e**ffi**ciency, modularity, and scalability for autonomous applications.

TECHNICAL EXPERTISE

Backend & Full-Stack Engineering

Extensive experience designing and implementing scalable backend and full-stack applications. Proficient in building robust RESTful APIs and real-time systems using Node.js (NestJS), WebSockets, and structured application architectures. Strong understanding of authentication and authorization mechanisms inclu ...

Cloud, DevOps & Distributed Systems

Hands-on experience deploying, operating, and maintaining production systems on AWS, including EC2, ECS, S3, RDS, and Redis. Proficient in containerization using Docker, environment configuration, secure networking, and service-to-service communication. Experienced with asynchronous and distributed system pat ...

Applied AI & Intelligent Systems

Strong applied AIexperienceintegratingintelligent systems into real-world applications. Worked on multi-agent AI orchestration, OCR and document intelligence pipelines, voice-based AI systems, and real-time AI streaming. Experienced in integrating large language models and external AI services into backend ...

Computer Vision, Robotics & Embedded Systems

Practicalexperiencein computervision androbotics, with afocus on monocular vision, visual SLAM (vSLAM), and 3D human pose estimation on resource-constrained hardware. Implemented perception pipelines using a Raspberry Pi 4B and Pi Camera v2, emphasizing real-time performance and optimization under limite ...

Bushra Rehman

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PROFESSIONAL PROFILE

Please update objective section.

EDUCATION

Electrical Engineering
SEECS , Islamabad , 2.85 (2026)

INTERNSHIP EXPERIENCE

AIMS Lab, Sines, Nust
24-Jun-2024 - 24-Aug-2024

Weather Monitoring of local areas through ML

FINAL YEAR PROJECT

Non invasive glucose monitoring device

This project presents the design and development of a compact, finger-mounted non-invasive glucose monitoring device. The system uses a TSL optical sensor to acquire physiological data, which is processed using a trained machine learning model to estimate glucose levels. An ESP32 microcontroller is used for real-time data processing and wireless transmission to a mobile application. The application provides continuous monitoring and sends alert notifications to the patient's guardian when glucose levels exceed predefined thresholds. The proposed system aims to offer a portable, painless, and user-friendly solution for glucose monitoring.

TECHNICAL EXPERTISE

Hamza Irshad Bhatti

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PROFESSIONAL PROFILE

Motivated Electrical Engineering undergraduate at the National University of Sciences and Technology (NUST) with **strong academic performance** and **hands-on experience in wireless communication, computernetworks, and next-generation 5G/6G technologies.** Experienced in **research-driven environments,** with practical exposure to non-orthogonal multiple access (NOMA), signal interference cancellation, deep reinforcement learning for wireless systems, and software-defined networking. Skilled in C/C++, Python, MATLAB, NS2, Mininet, and network simulation and modeling tools. Demonstrated ability to design and implement innovative engineering solutions through academic and research projects, complemented by proven leadership, teamwork, and communication skills. Aspires to contribute to advanced research and industry development in **wireless communications** and **intelligent networking systems**.

EDUCATION

Bachelors in Electrical Engineering

School of Electrical Engineering & Computer Science (SEECS) , Islamabad , 3.43/4.00 (2026)

INTERNSHIP EXPERIENCE

Information Processing & Transmission (IPT) Lab, SEECS

20-Jun-2025 - 19-Apr-2026

I conducted research on NOMA-based Backscatter Communication (BackCom) to enhance network performance. In addition I worked on improving Signal Interference Cancellation (SIC) and Channel State Information (CSI) through Deep Reinforcement Learning (DRL) algorithms for robust and efficient wireless systems and publised a research paper in IEEE WCNC conference 2026.

Optical NetworksandTechnologies(ONT)Lab,SEECS

19-Jul-2025 - 18-Sep-2025

I worked on designing and testing Layer-3 network solutions using Mininet. I participated in hands-on projects and on advanced networking protocols and topologies. I explored emerging networking technologies and gained practical insights into the academic research process.

XFlow ResearchInc.

21-Jun-2025 - 01-Jan-2026

I contributed to next-generation 5G/6G technology development, focusing on network optimization and innovation. I actively assisted in projects involving SONiC Network Operating System (NOS) and advanced software-defined networking (SDN) concepts. I acquired deep understanding of future mobile network architectures and industry research practices.

FINAL YEAR PROJECT

Reinforcement Learning-based Performance Optimization of BackScatter Systems with Practical Constraint

This project focuses on optimizing the uplink performance of a two-user NOMA-assisted backscatter communication (BackCom) system for IoT networks. It studies how practical system impairments, specifically imperfect successive interference cancellation (SIC) and inaccurate channel state information (CSI), affect system performance. The project formulates a sum-rate maximization problem under quality-of-service and fairness constraints and uses a Deep Deterministic Policy Gradient (DDPG)–based d reinforcement learning algorithm to learn an adaptive power-allocation policy. The performance of the proposed learning-ba approach is compared with exhaustive search methods under both perfect and imperfect SIC and CSI conditions to evaluate robustn achievable sum rate, and computational complexity.

TECHNICAL EXPERTISE

Wireless Communication Systems

NOMA,backscattercommunication,uplinktransmission, SIC and CSI modeling.

Machine Learning

CNNs&Deepreinforcement learning (DDPG) for multipurpose environments including wireless resource and power allocation.

Signal Processing

Channelmodeling,interference analysis, and performance evaluation.

Computer Networks

Networkarchitecture,routing protocols, and performance analysis.

Software-Defined Networking (SDN)

ProgrammablenetworksusingOpenDaylightand SONiC.

Network Simulation & Emulation

NS2andMininetforsystemmodelingandexperimental validation.

Programming & Scientific Computing

Python,MATLAB,C/C++foralgorithmdevelopment and simulations.

Research & Data Analysis

System-levelmodeling,numericalanalysis, and result interpretation.

Momina Nadeem

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PROFESSIONAL PROFILE

Motivated undergraduate student of Electrical Engineering at the National University of Sciences and Technology (NUST), with strong academic grounding in digital systems, electronics, and hardware design. Hands on experience through multiple research and laboratory based internships at SEECS, NUST, involving Verilog based processor design and PCB proven electronic systems. Seeking opportunities for advanced research, internships, or higher studies to further develop practical engineering and research skills.

EDUCATION

Electrical Engineering

School of Electrical Engineering and Computer Science (SEECS) , Islamabad , 3.48 (4th)

INTERNSHIP EXPERIENCE

System onChip(SoC)Lab,SEECS,NUST

09-Jul-2024 - 06-Sep-2024

1. Completed a research internship focused on digital system and processor design using Verilog HDL. 2. Successfully performed 11 hands-on labs, covering: Digital logic design Finite State Machines (FSMs) Memory blocks VGA controller design Implementation of Bresenham's Circle Algorithm 3. Gained strong experience in hardware simulation, verification, and testing. 4. Demonstrated punctuality, strong work ethic, and the ability to quickly grasp complex hardware concepts.

Micro NanoElectronics(MINE)Lab,SEECS,NUST

05-Jun-2024 - 28-Aug-2024

1. Worked on the design and development of PCB-proven electronic systems. 2. Assisted in schematic design, PCB layout, and system testing. 3. Developed practical understanding of electronic hardware design workflows. 4. Strengthened skills in problem-solving, documentation, and laboratory practices.

FINAL YEAR PROJECT

5g Phy Optimization: A Hybrid Arm and FPGA Approach

TECHNICAL EXPERTISE

Hardware & Digital Design

Verilog HDL Digital Logic Design Finite State Machines (FSMs) Processor Design

Electronics & PCB Design

Electronic Circuits PCB Design & Testing Hardware Prototyping

Tools & Concepts

Hardware Simulation & Verification Laboratory Testing & Debugging Technical Documentation

Sabika Fatima

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate with a strong foundation in embedded system design, machine learning, and applied artificial intelligence. Academic and project work includes STM32-based RTOS applications, real-time driver drowsiness detection using computer vision, and intelligent safety and monitoring systems. Experienced in combining hardware, software, and data-driven approaches to address real-world engineering challenges. Actively involved in research, development, and innovation-focused projects across embedded, AI and signal processing domains.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3.12 (2026)

INTERNSHIP EXPERIENCE

Web DeveloperIntern—CodSoft

01-Jun-2023 - 01-Jul-2023

1)Designed and developed responsive web pages using HTML and CSS. 2)Built a landing page and personal blog website focusing on usability and clean UI design. 3)Developed a travel agency website using Java and HTML, implementing structured layouts and basic functionality. 4)Gained practical experience in frontend development and web deployment workflows.

Research Intern—MachvisLabSEECS

01-Jun-2024 - 01-Sep-2024

1)Reviewed research papers on driver drowsiness detection. 2)Conducted research on accident prevention and driver safety systems using machine learning techniques. 3)Worked with real-time data acquisition and preprocessing for safety-critical applications. 4)Contributed to experimental analysis and performance evaluation of deep learning models.

AI Intern — National Aerospace Science & Technology Park (NASTP), QUEST Program

01-Jul-2025 - 31-Aug-2025

1)Worked in the AI division, contributing to software and AI-based development projects. 2)Developed a portfolio website to showcase technical projects and professional work. 3)Built a card scanner web application using OCR for automated text extraction. 4)Contributed to a large-scale project “Connects”, aimed at integrating multiple online shopping platforms in Pakistan into a single unified system.

Intern —Finplement

01-Jul-2025 - 01-Sep-2025

1)Conducted a detailed audit of Finplement’s website and LinkedIn presence. 2)Prepared and delivered a professional presentation with actionable recommendations for improving digital visibility and engagement. 3)Demonstrated strong analytical, communication, and strategic thinking skills in a corporate setting. 4)Worked closely with the operations team to align recommendations with business goals.

FINAL YEAR PROJECT

Reconstruction of self mixing interferometric (SMI) signals for weak feedback

This project focuses on interferometric phase reconstruction under low-contrast (C < 1) conditions, where conventional phase extraction techniques fail or produce large errors. A zero-crossing–based reconstruction pipeline is developed to estimate displacement and phase accurately from noisy interferometric signals. The work involves signal preprocessing, zero-crossing

detection, and phase accumulation, with performance evaluated on both simulated and experimental data. The proposed approach demonstrates improved robustness and accuracy in low-visibility interferometric measurements.

TECHNICAL EXPERTISE

Embedded Systems & Hardware

Microcontroller programming (Arduino, STM32) RTOS-based system design and task scheduling Embedded C / C++ for real-time applications Sensor interfacing (MPU6050, pulse sensor, smoke/fire sensors) Motor control and drivers (L298, stepper motors) Hardware–software integration and debugging Verilog HDL an ...

Signal Processing & MATLAB

Real-time signal processing and analysis MATLAB-based modeling, simulation, and visualization Interfacing MATLAB with hardware systems

Software Development & Web Technologies

Programming: Python, C++, Java Frontend development: HTML, CSS Database fundamentals: MySQL

Tools & Platforms

MATLAB Arduino IDE STM32 development tools (STM32CubeIDE) Quartus LTspice PSpice Verilog HDL

Muhammad Hammad Sarwar

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate with a minor in AI, specializing in the intersection of nonlinear control, deep learning, and computer vision. Proven researcher at DRONEXAS Lab developing BiLSTM-enhanced control frameworks, complemented by practical experience in object tracking and classical CV techniques. Proficient in MATLAB/Simulink and Python, o**ff**ering a strong ability to bridge theoretical modeling with visual perception for autonomous systems

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3.51 (2026)

INTERNSHIP EXPERIENCE

DRONEXAS Lab

03-Feb-2025 - 05-Sep-2025

During my tenure at the DRONEXAS Lab, SEECS, I have gained extensive hands-on experience in control systems and robotics. As a Control and Robotics Intern, I led the end-to-end assembly and validation of drone systems, implementing PID controls and Kalman filters to ensure stability and precise state estimation. My work extended to designing custom tethered drone solutions, which included 3D-printing mechanical components and integrating communication systems for public demonstration. Promoting to a Research Intern role, I shifted focus to advanced biomedical applications, developing nonlinear control strategies (SMC and TSMC) in MATLAB/Simulink for prosthetic joint regulation. I further innovated in this space by proposing a BiLSTM-assisted control framework that significantly improved predictive accuracy for gait references, a contribution currently under peer review

FINAL YEAR PROJECT

BiLSTM-Enhanced Nonlinear Control for Prosthetic Knee Joints in Gait and Health Applications,

This project focuses on the precise regulation of prosthetic knee and hip joints by integrating nonlinear control theory with deep learning. I developed and simulated Sliding Mode Control (SMC) and Terminal SMC strategies in MATLAB Simulink, successfully improving transient performance for prosthetic actuation. To enhance system intelligence, I engineered a BiLSTM-assisted framework to predict control inputs from gait references, achieving high predictive accuracy with R^2 values of 0.95 for the hip and 0.88 for the knee. This research culminated in a manuscript titled "BiLSTM-Enhanced Nonlinear Control for Prosthetic Knee Joints in Gait and Health Applications," which is currently under peer review.

TECHNICAL EXPERTISE

Control, Communication, Signal Processing and Artificial Intelligence related skills

• Control Systems: PID, Sliding Mode Control (SMC), Terminal SMC, State-Space Modeling, Kalman Filtering • Signal Processing: FFT, Spectral Analysis, MFCCs, Feature Extraction, Time/Frequency-Domain Analysis • Communication Systems: Digital Modulation (BPSK, QPSK, QAM), BER Analysis, AWGN Channel Modeling ...

Muhammad Haris

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PROFESSIONAL PROFILE

Please update objective section.

EDUCATION

BEE

SEECS , Islamabad , 2.5 (2022)

INTERNSHIP EXPERIENCE

Nokia AlcatelLucent

07-Jul-2025 - 12-Aug-2025

Understanding the cloud RAN deployement. Understanding the organizational structure and hirerarchy. Analysing sevice delivery mechanisms.

FINAL YEAR PROJECT

Analyzing Federated Learning Techniques in Quantum Computing Environments for Quantum Federated Learning (QFL) Applications

Federated learning (FL) is an emerging paradigm that enables collaborative model training across multiple participants without the need to exchange raw data, thereby preserving privacy and security. With the rapid advancement of quantum computing, there is a growing interest in exploring how FL can be adapted to or executed on quantum platforms. This project proposes an in-depth analysis of federated learning on quantum computers, with the aim of identifying the opportunities, challenges, and feasibility of integrating these two technologies. Using Qiskit as a simulation framework, we will model distributed learning scenarios on quantum circuits, investigate the e**ff**ects of noise and limited qubit resources, and analyze the scalability of quantum based FL approaches. The study will also benchmark quantum implementations against classical federated learning in terms of convergence, resource e**ffi**ciency, and resilience to errors. The expected outcome of this work is a comprehensive understanding of the design considerations andpotential advantages of deploying federated learning within quantum computing environments, contributing toward the development of secure and scalable next-generation machine learning systems.

TECHNICAL EXPERTISE

Machine Learning and Networking

Understanding of python,C++ and C.

Awais Asghar

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PROFESSIONAL PROFILE

High-achieving Final Year **Electrical Engineering** student at **NUST** with specialized expertise in **FPGA-based RTL Design**, **Embedded Systems**, and **AI Acceleration**. Proven track record in designing **RISC-V Processors** using **SystemVerilog** and optimizing **Deep Learning** models for hardware integration. Selected for the prestigious **MITACS Globalink Research Internship** (Canada, 2026), bringing diverse R&D experience in **Chip Design** and **Embedded systems**, aiming to deliver high-performance solutions at the intersection of hardware and intelligent systems.

EDUCATION

Bachelor of Electrical Engineering

National University of Sciences and Technology (NUST) , Islamabad , 3.58/4.0 (2022 – 2026)

INTERNSHIP EXPERIENCE

NUST Chip Design Centre (NCDC)

12-Feb-2025 - 31-Aug-2025

Worked on FPGA-based digital chip design projects involving RTL design, simulation, and hardware implementation in System Verilog, gaining hands-on experience with C programming, Linux, Digital System Design, RISC-V and computer architecture, and processor design. Implemented a 5 Stage Pipelined Single-Cycle RISC-V Processor using System-Verilog on FPGA. Project includes complete datapath and control logic with instruction memory, data memory, ALU, immediate generator, and branch comparator. It supports the complete RV32I instruction set (R, I, S, B, U, J types) and optimized for hardware-software co-design learning. Designed and implemented an FPGA-based smart anti-theft car security system in Verilog HDL on the DE1-SoC, featuring a reprogrammable FSM, sensor debouncing, siren generation, and a fuel-pump safety interlock to prevent unauthorized access.

Deep LearningLab(SINES),NUST

01-Jun-2024 - 01-Sep-2024

Implemented machine learning and deep learning models for image processing and computer vision applications. Trained and evaluated convolutional neural networks using PyTorch and TensorFlow with GPU acceleration through CUDA. Validated model performance using standard metrics and gained experience in end to end model development and experimentation.

HamsanTech , NSTP

06-Jun-2023 - 01-Sep-2023

Built complete machine learning pipelines for industry datasets, covering data preprocessing, feature extraction, model training, and evaluation. Developed a skin cancer detection system using ensemble learning techniques, achieving high classification accuracy and strong AUC performance. Applied models including XGBoost, SVM, and Logistic Regression to deliver reliable and interpretable results.

FINAL YEAR PROJECT

ML based Hardware Accelerator for Real Time Image Segmentation on FPGA

Designing an FPGA based hardware accelerator for real time image segmentation using an encoder decoder architecture. The project focuses on deploying a lightweight U-Net model optimized for hardware implementation to achieve low latency and high throughput. Parallel processing and on chip memory optimization techniques are used to e**ffi**ciently map convolution, pooling, and upsampling operations on FPGA fabric. The system is evaluated by benchmarking performance against CPU and GPU implementations in terms of speed, accuracy, and energy e**ffi**ciency, with target applications in autonomous driving and medical imaging.

TECHNICAL EXPERTISE

RTL and FPGA Design

RTLDesign,Verilog,SystemVerilog, FPGA Architecture, RISC V Processor Design, Computer Architecture, Digital System Design, Hardware Verification, Artix A7, Zybo Z7-20, DE1 SoC, AXI Interface

Embedded Systems

Embedded C,FreeRTOS,I2C, UART, SPI, Embedded Linux, Bootloaders, Linux Kernel Configuration, GPIO and Peripheral Interfacing, STM32, ESP32, Arduino, ATmega Microcontrollers, Jetson Orin Nano

Machine Learning

Supervised&Unsupervised Learning , Linear & Logistic Regression , Decision Trees & SVM , K-Nearest Neighbors , Clustering & Anomaly Detection , Dimensionality Reduction (PCA) , Feature Extraction , Neural Network Training , Data Scraping and Data cleaning.

Deep Learning

TensorFlow , Keras , PyTorch , Scikit-learn , NumPy & Pandas , Matplotlib , ANNs , CNNs , RNNs & LSTMs , Generative Models , GANs , Autoencoders , Transformers & LLMs.

Computer Vision

OpenCV,ImageProcessing, Filtering, Edge & Feature Detection (Canny, Harris, SIFT, SURF). Camera Models, Calibration, Stereo, Homography, Perspective Transformations. Object Detection (YOLO), Object Tracking (SORT), Kalman Filter, Image Segmentation (Clustering, U-Net), Optical Flow. Pose Estimation, Structu ...

Programming Languages

C/C++ , EmbeddedC , CUDA , Python , Verilog HDL , SystemVerilog , Assembly , MATLAB & Simulink.

Development Platforms & Tools

XilinxVivado,VivadoHLS,IntelQuartus,ModelSim, Venus RISC-V Simulator, IAR Workbench, STM32Cube IDE, Arduino IDE, Atmel Studio, VS Code, Jupyter Notebook, Google Colab, Kaggle. MATLAB, Simulink, LabView, Proteus, PSpice, Power BI, Tableau, Git/GitHub, RealVNC, FileZilla.

Rabia Rani

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PROFESSIONAL PROFILE

Electrical Engineering graduate from NUST with hands-on experience in **embedded systems**, IoT, and digital communication. Skilled in developing and integrating hardware-software solutions using microcontrollers (ESP32, Arduino, ATmega) and **communication protocols** (UART, SPI, I²C). Experienced in RF signal processing, SDR applications, and LoRa technology, with strong expertise in GNU Radio and PlutoSDR. Proficient in **machine learning** for IoT security applications, including RF fingerprinting using deep learning models. Strong foundation in **computer architecture, digital system design**, and FPGA-based prototyping. Adept at problem-solving, hardware debugging, and end-to-end system development, with practical experience in MATLAB, Python, Verilog, and industry-standard engineering tools.

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering and Computer Science (SEECS) , Islamabad , 3.25 (2026)

INTERNSHIP EXPERIENCE

Smart Agri-TechLab,SINES,NUST

09-Jun-2025 - 31-Aug-2025

• Worked on GNU Radio for implementing and simulating digital communication systems. • Designed and tested signal processing blocks for Software Defined Radio (SDR) applications. • Utilized PlutoSDR for RF signal transmission and reception experiments. • Investigated LoRa physical layer implementation and IQ sampling techniques.

EmbedAIOT

01-Jun-2024 - 31-Aug-2024

• Worked with ESP32 microcontroller, developing and testing embedded applications for IoT-based systems. • Integrated multiple sensors and modules using communication protocols such as I2C, SPI, and UART. • Implemented basic PCB design, including schematic creation and component placement. • Performed hardware debugging, testing, and system integration to ensure reliable operation.

FINAL YEAR PROJECT

RF Fingerprinting for IoT Device Security Using Deep Learning

This project explores RF fingerprinting as a hardware-intrinsic security solution for large-scale IoT systems. A deep learning–based model is developed to classify and authenticate IoT devices using their unique radio-frequency characteristics, providing physical-layer protection against device spoofing attacks.

TECHNICAL EXPERTISE

Programming Languages

Assembly, C, C++, Python, Verilog

Embedded Systems

• Hands-on experience with Arduino, ESP32, and ATmega microcontrollers. • Sensor and peripheral interfacing for real-time embedded applications. • End-to-end embedded system development, from hardware to firmware. • Proficient in communication protocols: UART, SPI, and I²C. • IoT system design and int ...

Software & Engineering Tools

MATLAB, GNU Radio, Proteus, PSpice, AutoCAD, Arduino IDE, Vivado, Quartus

Machine Learning

• Strong understanding of supervised and unsupervised learning. • Hands-on experience with KNN, CNN, and other ML algorithms. • Skilled in data preprocessing, feature engineering, and model evaluation. • Proficient in Python libraries: NumPy, Pandas, Scikit-learn, TensorFlow, and Keras.

Computer Architecture & Digital Systems

• Knowledge of RISC-V processor architecture and design, including instruction sets and pipeline concepts. • Hands-on experience with FPGA-based development for prototyping and testing digital circuits. • Learned Digital Logic Design and Digital System Design, including combinational and sequential circu ...

Muhammad Arham Siddiqui

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate at NUST SEECS with a 3.92 CGPA and a focus on System-on-Chip design and Computer Architecture. My background combines industry experience in hardware verification from DreamBig Semiconductors with academic research in AI for Electronic Design Automation. Currently, I am leading research on using Large Language Models to automate UVM testbench generation while finalizing my degree. I have practical experience with AMBA protocols, RTL design, and SystemVerilog, and I am looking to apply these skills in a challenging digital IC design or verification role.

EDUCATION

BE Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 3.90 (2026)

INTERNSHIP EXPERIENCE

DreamBig Semiconductors

01-Jun-2025 - 31-Aug-2025

During my internship at DreamBig Semiconductors, I focused on developing UVM-based verification environments for AMBA protocol IPs. I was responsible for implementing essential components including agents, drivers, monitors, and scoreboards to support complex SoC subsystems. My daily work involved waveform debugging, running protocol compliance checks, and managing regressions to ensure verification quality. I also collaborated closely with senior engineers on structured verification planning and achieving coverage closure.

NUST Chip Design Center

01-Feb-2025 - 31-May-2025

I worked as a Digital IC Design Intern where I designed, simulated, and verified RTL modules using Verilog and SystemVerilog. I assisted the team with FPGA prototyping, including pin planning and timing validation, and helped integrate custom IP blocks into larger designs. Additionally, I conducted block-level functional testing and validated pipeline behavior to support the lab's VLSI design flows and hardware validation processes.

FINAL YEAR PROJECT

VeriLLM: LLM-Accelerated UVM Testbench Development

As the technical lead at the System on Chip Lab, I am directing the development of an AI driven framework designed to automate the creation of UVM verification environments. This project addresses the increasing complexity of modern IC designs by translating natural language specifications into fully synthesizable SystemVerilog code. In this role, I manage a team of three researchers and oversee the project roadmap, which included building a custom dataset generation pipeline to better train our models on UVM structures. My technical contributions involve designing system architectures and abstraction models that enable Large Language Models to autonomously generate essential testbench components such as agents, drivers, and scoreboards. Beyond code generation, the project investigates how to integrate LLM reasoning with formal verification and coverage guided stimulus generation
to improve overall design assurance. We have successfully developed a prototype that produces syntactically correct SystemVerilog components and are currently preparing our findings for publication.

TECHNICAL EXPERTISE

Hardware Verification & UVM Methodology

My core experience lies in developing UVM-based verification environments, specifically for AMBA protocol IPs. During my time at

DreamBig Semiconductors, I implemented agents, drivers, monitors, and scoreboards to ensure comprehensive functional coverage. I am proficient in waveform debugging and performing p ...

Digital IC Design & FPGA Prototyping

I have practical experience designing, simulating, and verifying RTL modules using Verilog and SystemVerilog. At the NUST Chip Design Center, I assisted in FPGA prototyping and timing validation for SoC components, gaining exposure to standard VLSI design flows. My academic work supports this with a strong fo ...

AI for Electronic Design Automation (EDA)

I am actively researching the intersection of Artificial Intelligence and hardware design. As a Research Lead, I am directing the development of a framework that uses Large Language Models to translate natural language specifications into synthesizable SystemVerilog. My work involves investigating how ML-base ...

Ranomal

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate at NUST with a strong foundation in electronics, embedded systems, and circuit design, complemented by hands-on experience through industry-focused internships and multidisciplinary projects. Skilled in PCB design, microcontrollers, FPGA, simulation tools, and Python-based machine learning workflows. Demonstrated ability to solve real-world engineering problems through data-driven approaches, system modeling, and effective teamwork. Motivated, detail-oriented, and eager to contribute technical expertise to innovative engineering teams while continuously learning in a professional industry environment.

EDUCATION

Electrical Engineering

SEECS , islamabad , 2.9/(1057/1100) (2026)

INTERNSHIP EXPERIENCE

NOVAtechX | Online

01-Jul-2025 - 01-Sep-2025

Selected for a competitive, multi-university internship involving students from leading engineering institutions. Applied systems engineering principles to analyze real-world healthcare and MedTech problems. Performed requirements analysis and system modeling (SysML) to define functional and non-functional system requirements. Conducted problem formulation and stakeholder analysis based on healthcare workflows and constraints. Collaborated in multidisciplinary teams to design system-level solutions focused on reliability, scalability, and usability. Gained exposure to healthcare environments through field insights, enhancing understanding of practical system limitations. Contributed to solution documentation, presentations, and design reviews following structured engineering approaches.

FINAL YEAR PROJECT

IoT-Based Industrial Contactor Control & Monitoring System using ESP32 and PLC

Designed and developed an industrial IoT system for remote control and real-time monitoring of high-power electrical contactors used in motor and industrial load switching. The system integrates an ESP32 microcontroller with a Siemens PLC using Modbus RTU over RS-485 (MAX485 module) to enable secure and reliable communication between IoT and industrial automation layers. A web-based graphical user interface (GUI) allows users to remotely switch contactors ON/OFF, monitor operational status, and receive real-time feedback. Electrical isolation is achieved using optocouplers to ensure safety and protection of control electronics. The solution improves operational efficiency, reduces downtime, enhances safety, and supports scalable industrial automation. Technologies & Tools: ESP32, Siemens PLC (TIA Portal), Modbus RTU, MAX485 (RS-485), Optocouplers, Industrial Contactors, WinCC, Ladder Logic, IoT Dashboard, Wi-Fi Communication

TECHNICAL EXPERTISE

Electronics & Hardware,Simulation & Analysis Tools,Programming & Software,Data & Machine Learning

1: Analog and Digital Circuit Design PCB Design & Prototyping (KiCad, Eagle) Electronic Component Soldering & Debugging MOSFET & BJT-Based Circuit Design I.C.-Based System Design Microcontrollers (Arduino UNO/Nano, ESP32) FPGA Design (Intel Quartus) IoT System Development 2: MATLAB & Simulink NI Multi ...

Haffi Sajid

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PROFESSIONAL PROFILE

Myself Ha**ffi** Sajid- A motivated and detail-oriented final-year engineering student with strong foundations in technical analysis, problem-solving, and applied research. Experienced in corporate engineering environments through hands-on internship exposure, with a growing interest in the application of AI and machine learning for real-world problem solving. Demonstrates the ability to work collaboratively in multidisciplinary teams, adapt to professional settings, and communicate e**ff**ectively with technical and non-technical stakeholders. Seeking opportunities to apply technical expertise and analytical skills in a challenging professional environment.

EDUCATION

Bachelors in Electrical Engineering
SEECS , Islamabad , 3.07 (4)

INTERNSHIP EXPERIENCE

DESCON EngineeringLimited
01-Jul-2025 - 15-Sep-2025

Completed a professional internship at DESCON Engineering Limited in the Design and Infrastructure Division, gaining practical exposure to corporate engineering operations and industry practices. Worked under the supervision of senior engineers and actively participated in technical discussions and coordination activities. Key learnings and responsibilities included: Gained hands-on exposure to engineering design workflows and infrastructure project planning. Attended technical and coordination meetings with multiple vendors and suppliers, including Schneider Electric and cable vendors, to understand procurement, specifications, and compliance requirements. Developed an understanding of corporate work culture, professional communication, documentation standards, and teamwork in a large engineering organization. Observed real-world project execution processes, stakeholder coordination, and decision-making in an industrial environment. This internship strengthened both technical understanding and professional skills essential for working in corporate and engineering settings.

FINAL YEAR PROJECT

Remote Monitoring of Cardiovascular Diseases Using AI/ML
Designed and developed a final-year project focused on the remote monitoring of cardiovascular diseases using artificial intelligence and machine learning techniques. The project aims to assist in early detection and continuous monitoring of cardiovascular health through data-driven analysis. Project highlights: Utilized physiological signals (such as ECG/PPG-based parameters) for cardiovascular condition monitoring. Applied machine learning algorithms for pattern recognition, feature extraction, and disease prediction. Emphasized remote and real-time monitoring to support preventive healthcare and early diagnosis. Integrated concepts from signal processing, data analysis, and AI/ML to address a real-world healthcare problem.

TECHNICAL EXPERTISE

Programming & Tools / Machine Learning / Signal Processing / Healthcare Analytics / Project Management Technical Documentation / Corporate Engineering Exposure / Professional Communication / Tea Coordination
Possesses technical expertise in programming and computational tools including Python and MATLAB, with experience in data analys visualization, and signal processing. Has a solid understanding of machine learning concepts such as supervised and unsupervised learnir feature extraction, model evaluation, a ...

Ahmed Rafiq

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate at NUST with strong analytical and mathematical foundations, and focused interests in computer vision, signal processing, and system-level analysis. Demonstrated hands-on exposure to real-world engineering environments through technical internships, alongside academic projects involving modeling, control, communication-oriented systems, and performance evaluation using Python, MATLAB/Simulink, and C/C++.

Experienced in developing and assessing software-centric engineering solutions where data, signals, and system behavior drive design decisions. Currently working on a vision-guided autonomous tracking Final Year Project, emphasizing deep-learning-based object detection, optimization, and robust evaluation under practical constraints. Known for strong problem-solving ability, quantitative reasoning, and the ability to connect theoretical concepts with real-world engineering applications.

EDUCATION

Bachelors in Electrical Engineering

School of Electrical Engineering and Computer Sciences (SEECS) , Islamabad , 3.54 (2026)

INTERNSHIP EXPERIENCE

Faisal AlshuhailCompanyandMacrewMarineServicesEst

01-Jul-2024 - 31-Aug-2024

Technical Intern — Faisal Alshuhail Company July 2024 – August 2024 | Dammam, Saudi Arabia • Evaluated electrical and mechanical components in rotating machines. • Assisted in product reliability testing for industrial electrical equipment. • Strengthened analytical skills in diagnosing electrical power system issues. Technical Intern — Macrew Marine Services Est July 2024 – August 2024 | Dammam, Saudi Arabia • Assisted in installation, fault diagnosis, and rectification of marine electrical systems.
• Worked on navigation and safety systems including AIS, GMDSS, and bilge alarm systems. • Developed hands-on expertise in troubleshooting shipboard electrical faults under real operational constraints.

FINAL YEAR PROJECT

Vision-Guided Autonomous Drone Tracking System

Designing and developing a real-time vision-based autonomous tracking system for aerial platforms using deep learning and control integration. The project focuses on accurate detection and tracking of target objects using YOLOv8-based computer vision, with emphasis on small and distant object recognition, real-time performance, and robustness under varying conditions. The system integrates object detection, tracking algorithms, and control logic to enable autonomous target following, with potential applications in surveillance, search-and-rescue, and intelligent monitoring systems. Performance evaluation is conducted based on detection accuracy, latency, and tracking stability.

TECHNICAL EXPERTISE

Technical Expertise

Programming & Software • Python, C/C++, MATLAB • Verilog, Assembly Language (course-work level understanding) Engineering & Simulation Tools • MATLAB, Simulink • LTspice, PSpice, Multisim, Proteus • Arduino, LabVIEW • AutoCAD Computer Vision & AI (Academic / Project-Based) • Object detecti ...

Muhammad Hassan Akram

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student with a strong focus on computer architecture, parallel systems, and performance analysis. Experienced in designing and evaluating SMP-based architectures, cache hierarchies, and memory systems through an in-depth Final Year Project using architectural simulators and quantitative performance metrics. Solid foundation in processor design concepts, caching, coherence protocols, and system-level analysis, with hands-on experience translating theoretical concepts into practical simulations and evaluations. Detail-oriented, analytical, and motivated to begin a professional career in hardware systems, computer architecture, or performance-focused engineering roles.

EDUCATION

Electrical Engineering

SEECS , ISLAMABAD , 2.95 (2026)

INTERNSHIP EXPERIENCE

Nust ChipDesignCenter(NCDC)

10-Jun-2025 - 29-Aug-2025

Embedded C, Digital Logic Design , RISC V and Computer Architecture

FINAL YEAR PROJECT

Design of a RISC V Based Symmetric Multi Processor

The project involves design, implementation and verification of a RISC-V based Symmetric multiprocessor (SMP) architecture. As processor's frequency can't be scaled beyond a certain limit without compromising on power consumption, multiprocessors is a promising solution for improving performance without compromising power consumption. Objectives: • Design a RISC-V based SMP architecture and simulating it in gem5 simulator for performance analysis • Implement the design in RTL and perform design verification in UVM • Physical design of the SMP architecture (RTL to GDS-II) Scope: This project involves design space exploration of shared memory architectures. It also encompasses the development of a shared memory architecture that can be scaled up to eight cores without compromising on memory access bandwidth. A prototype of the project will be developed at RTL level and will be verified in UVM.

TECHNICAL EXPERTISE

Programming

Proficient in C, C++, Python, Verilog/SystemVerilog, Assembly, and RISC-V Assembly

Tools & Platforms

Experienced with Vivado, Quartus Prime, STM32CubeIDE, MATLAB, VS Code, and Atmel Studio

Computer Architecture

Solid understanding of RISC-V ISA, pipelined processor design, and memory hierarchy/interfacing

Muhammad Usman Khawar

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PROFESSIONAL PROFILE

Detail-oriented Electrical Engineering student with strong practical exposure to industrial electrical systems, automation, and motor control. Hands-on experience in PLC-based automation, VFD configuration, power quality analysis, and electrical panel testing gained through an industrial internship at a large manufacturing facility. Familiar with industrial safety standards, troubleshooting, and reading electrical schematics. Motivated to contribute to power, automation, or maintenance roles while continuously enhancing technical and problem-solving skills in a professional engineering environment.

EDUCATION

Bachelors of Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad (2026)

INTERNSHIP EXPERIENCE

Service IndustriesGujrat

13-Jun-2025 - 09-Aug-2025

Completed an 8-week internship in the Instrumentation & Electrical Department at Servis Tyres Pvt. Ltd. Gained hands-on experience with PLC-based automation, VFD configuration, power quality analysis, and industrial motor control (DOL & Star-Delta). Assisted in electrical panel testing, TBM troubleshooting, inverter installation, and fault diagnosis while following industrial safety standards and collaborating with multidisciplinary engineering teams.

FINAL YEAR PROJECT

AI based Smart Power Management System (Residential)

Proposed an AI-enabled IoT-based residential power management system aimed at reducing electricity costs and improving appliance safety. The system is planned to provide real-time, room-level energy monitoring through non-invasive current sensors and a central control hub installed at the main distribution board. It is intended to support automated over-voltage, under-voltage, and overload protection with remote power control. A cross-platform mobile application is planned for real-time visualization, historical analytics, and user-defined thresholds. The project also proposes on-device machine learning using TensorFlow Lite for o**ffl**ine electricity bill forecasting and energy optimization.

TECHNICAL EXPERTISE

Electrical Maintenance & Troubleshooting

Basic hands-on experience in identifying, testing, and troubleshooting electrical faults in industrial equipment, motor circuits, and control panels while following safety procedures.

Motor Control Systems

Familiar with DOL and Star-Delta motor starters, contactors, overload relays, and timers. Able to understand wiring diagrams and assist in motor control circuit testing.

PLC & Industrial Automation Basics

Basic exposure to PLC-based automation, ladder logic understanding, I/O modules, and monitoring automated processes in a manufacturing environment.

Variable Frequency Drives (VFDs)

Understanding of VFD operation, parameter setting, fault identification, and speed control of AC motors used in industrial applications.

MATLAB & Engineering Analysis

Proficient in using MATLAB for basic numerical analysis, data visualization, and solving electrical engineering problems, including matrix operations, plotting, and simulation of fundamental engineering concepts.

Muhammad Taaha Hashmi

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PROFESSIONAL PROFILE

Electrical Engineering student at SEECS, NUST. I possess a deep-rooted interest in the synergy between robust hardware design and automated intelligence. Through my involvement in the Xcelerium, I have gained valuable exposure to industry-standard methodologies, refining my ability to transition theoretical concepts into scalable, real-world engineering solutions. My background focuses on developing high-fidelity systems that bridge the gap between physical components and digital decision-making.

I am a detail-oriented problem solver with a proven ability to navigate the complexities of system integration, from low-level circuit design to high-level algorithm implementation. I excel in collaborative, multidisciplinary environments where technical precision and creative thinking are required to solve complex challenges. With a commitment to continuous learning and technical excellence, I am prepared to contribute to innovative teams focused on advancing the next generation of autonomous and intelligent systems.

EDUCATION

Bahelors in Electrical Engineering

SEECS , Islamabad , 3.27 (2022)

INTERNSHIP EXPERIENCE

Xcelerium

03-Nov-2025 - 02-Feb-2026

During my time in the Xcelerium (XCLR) early hire program, I gained hands-on experience in high-performance processor verification, specifically focusing on the CVA6 RISC-V architecture. I worked extensively within the Cadence Xcelium environment, where I managed complex simulation infrastructures, resolved RTL compilation dependencies, and verified critical processor components such as the Memory Management Unit (MMU) and Floating Point Unit (FPU). Beyond technical debugging and verification, I contributed to the team's e**ffi**ciency by developing a comprehensive beginner's guide for the Cadence Xcelium toolset. This role allowed me to bridge the gap between academic hardware design and industry-standard verification methodologies, sharpening my ability to ensure system-level reliability in complex digital designs.

TUIL Lab at RIMMS

21-Jul-2025 - 21-Sep-2025

During my summer internship, I led the initial development of a contactless health monitoring system using mm-Wave radar technology. I was responsible for the entire project lifecycle during this phase, from conducting research and defining the technical methodology to configuring the TI AWR6843AOP hardware for high-precision sensing. I successfully designed and implemented a digital signal processing pipeline that extracts heart and breathing rates from raw radar data by filtering out noise and isolating subtle body movements. By the end of the internship, I had established a fully operational test environment and validated the system's accuracy against medical-grade sensors, proving the feasibility of wireless vital sign tracking.

FINAL YEAR PROJECT

Vital Signs Monitoring using mm-wave Radar Technology

This project uses advanced radar technology to monitor a person's heart rate and breathing without any physical contact. By using a specialized mm-wave sensor, the system can detect tiny movements in the chest from a distance and convert that data into vital sign readings. The goal is to create a comfortable, wireless way to track health, making it especially useful for hospitals or home care where traditional wearable sensors might be inconvenient.

TECHNICAL EXPERTISE

Embedded Systems & Robotics

Ihave extensive experience in designing and implementing integrated systems using microcontrollers like the STM32, ESP32, and Arduino. My work in this field focuses on real-time system performance, sensor fusion, and hardware-software co-design, allowing for the creation of responsive and reliable robotic pl ...

Advanced Sensing & Signal Processing

Iamproficientinutilizinghigh-frequencymm-Wave radar technology for non-contact sensing applications. By applying digital signal processing techniques I can extract high-fidelity data from raw signals to monitor physical phenomena with sub-millimeter accuracy.

Computer Vision & Machine Learning

Ileverage Python andOpenCV todevelop vision-based systems for real-time monitoring and classification. My background in Machine Learning and Computer Vison allows me to implement predictive models and intelligent algorithms that enhance the capabilities of hardware systems through data-driven insights.

Digital Design and Hardware Architecture

Ihaveexperiencein digitallogicandprocessorarchitectures, specifically the RISC-V (CVA6) ecosystem. My skills include RTL simulation and FPGA ensuring that hardware designs meet rigorous functional and performance specifications.

Arsal Amin

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PROFESSIONAL PROFILE

Electrical Engineering graduate from NUST with a strong foundation in core electrical engineering subjects, complemented by practical experience in programming, system design, and applied engineering projects. Proficient in MATLAB, C++, Python, OpenCV, and fundamental computer science concepts including object-oriented programming and data structures. Academic training includes extensive coverage of core electrical engineering domains, along with electives in networking, power systems, and robotics.

Completed a multidisciplinary Final Year Project focused on developing an AI-enabled home healthcare assistance system, involving camera-based heart rate estimation using rPPG, voice-based user interaction through large language models, and event detection for emergency medical situations such as falls, strokes, and cardiac events. This project emphasized system integration, signal processing, computer vision, and user-centric design to deliver an accessible, non-diagnostic healthcare support solution.

Hands-on experience includes PCB and schematic design using EasyEDA and Proteus, along with 3D modeling using Fusion 360 and Onshape. Completed an internship at TERESOL, gaining practical exposure to C++ development, electronic design workflows, and engineering project execution. Known for strong communication, leadership, and coordination skills, with a consistent record of taking initiative in team-based projects. Particularly interested in robotics and intelligent engineering systems, and motivated to grow into roles that combine analytical thinking, problem-solving, and real-world system development.

EDUCATION

EE

SEECS , Islamabad , 2.34 (4)

INTERNSHIP EXPERIENCE

Teresol

07-Jun-2024 - 19-Jul-2024

C++ programming and PCB design

FINAL YEAR PROJECT

Baymax your personal healthcare companion

Using RPPG to accurately read heart rate through a camera, providing a friendly and easy to use voice based interface for people to resolve medical queries (non diagnostic) via LLMs and detecting emergency medical events such as falls, strokes and heart attacks through event detection. All of this will be implemented on edge through an Nvidia Jetson Orin Nano Super providing real time processing. Therefore providing a complete at home healthcare solution for people who find it hard to access medical services and mitigating the growing burden on caretakers.

TECHNICAL EXPERTISE

3D modeling

6 months experience working with all kinds of 3D modeling tasks in software such as Onshape and Fusion360

C++ proficiency

Proficient in OOP and DSA

Proteus and PCB design

Proficient in Proteus and EasyEDA for PCB and schematic designing

Ali Ahmad

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PROFESSIONAL PROFILE

Motivated electrical engineer with a strong technical foundation and a passion for innovation. Eager to apply problemsolving skills and technical expertise to challenging projects in electrical and related fields

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering and Computer Science (SEECS) , Islamabad , 3.61 (2026)

INTERNSHIP EXPERIENCE

ESDAC LAB

20-Jun-2024 - 30-Aug-2024

Deployed Ubuntu Linux on an FPGA-based SoC (DE-series board) and configured the system for embedded operation. Developed user-level applications in an embedded Linux environment for peripheral interaction and system testing. Implemented custom Linux drivers for hardware peripherals, including input devices, switches, and basic graphics control. Interfaced and acquired data from FPGA-based ADC modules and an ADXL345 accelerometer. Implemented and tested basic image processing routines on the embedded platform under system-level constraints

Fatima FertilizerCompanyLimited

18-Jun-2025 - 25-Jul-2025

Interpreted P&ID and PFD diagrams for process understanding and instrumentation mapping. Worked with industrial instrumentation analyzers for flow, level, temperature, pressure, conductivity, and pH measurement. Configured field devices using HART communicators for parameter setup and diagnostics. Gained exposure to Yokogawa DCS architectures, including system performance and redundancy concepts.

ChipXprt

24-Jun-2024 - 30-Aug-2024

Learned Verilog, Vivado and chip design process. Worked on implementing a JTAG port for flashing code onto a RV32IMAC RISC-V core. Learned Zepyhr RTOS and implemented it on a STM32 microcontroller.

FINAL YEAR PROJECT

Deep Learning–Based Drone Detection and Tracking

Designed and deployed a real-time drone detection and tracking pipeline for dynamic outdoor environments using live video streams. Implemented and optimized YOLO-based object detection models under strict real-time constraints, benchmarking multiple architectures to balance accuracy, latency, and embedded GPU e**ffi**ciency. Integrated a ByteTrack-based multi-object tracking pipeline to ensure consistent target identities and stable tracking across consecutive frames. Deployed, profiled, and optimized the full perception stack on NVIDIA Jetson platforms, transitioning from Jetson Nano to Jetson Orin Nano to significantly improve inference throughput and scalability. Evaluated end-to-end system performance using frame rate, inference latency, and tracking stability metrics to guide model and system-level design trade-o**ff**s. Integrated perception outputs with downstream control logic to enable closed-loop visual tracking based on image-plane error, moving beyond standalone detection. Contributed to a modular, extensible system architecture with emphasis on end-to-end latency, robustness, and deployment stability.

TECHNICAL EXPERTISE

Programming Languages
C, C++, Python, Verilog, Assembly (ARM)

Embedded & System Software
STM32,ESP32,FreeRTOS,ZephyrRTOS,Embedded Linux

Hardware & Engineering Tools
NVIDIAJetsonNano,JetsonOrinNano,FPGA platforms; Vivado, ModelSim, MATLAB

AI & Computer Vision
PyTorch,OpenCV;YOLO-based object detection, ByteTrack multi-object tracking; TensorRT optimization

Abdullah Khan

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PROFESSIONAL PROFILE

Aspiring Electrical Engineer leveraging analytical skills and hands-on experience to drive innovative, data-driven solutions.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3.44 (2026)

INTERNSHIP EXPERIENCE

Fatima FertilizerCompanyLimited

09-Jun-2025 - 22-Aug-2025

Instrumentation & Control Intern (E2L 2025) Engineered and optimized industrial instrumentation and control systems during the E2L program. Calibrated and troubleshooted industrial sensors using HART communicators. Monitored and enhanced DCS control signals and 4–20 mA loops for reliable plant operations. Contributed to process control improvements, supporting e**ffi**cient and stable chemical production.

ESDAC/ROMI Lab, SEECS, NUST

17-Jun-2025 - 30-Aug-2025

Embedded Systems Intern Worked on embedded Linux and FPGA-based development for real-time audio, sensor integration, and signal-processing applications on the DE1-SoC platform. Developed practical embedded systems including a multitone digital piano, an accelerometer-based motion interface, and an FPGA-driven oscilloscope. Optimized on-board image-processing performance for resource-constrained embedded hardware.

FINAL YEAR PROJECT

Deep Learning–Based Drone Detection and Tracking

Developed a real-time drone detection and tracking system with embedded AI on NVIDIA Jetson, capable of predicting flight paths, scoring threats, and enabling automated countermeasures. Leveraged YOLO for detection and ByteTrack for multi-object tracking, optimized for low-latency deployment with CUDA and TensorRT. Designed a modular perception-control pipeline for dynamic outdoor environments, demonstrating expertise in real-time computer vision, system optimization, and autonomous threat response.

TECHNICAL EXPERTISE

Programming Languages

C/C++, Python, Verilog, Embedded Linux/Assembly programming(ARM)

AI & Computer Vision

PyTorch, OpenCV, YOLO, ByteTrack, TensorRT

Engineering Tools

ModelSim, MATLAB, AUTOCAD, LabView, Proteus/SPICE, ROS, Jupyter Notebook

Embedded & System Software

STM32, ESP32, FreeRTOS, UART, SPI, I²C, NVIDIA Jetson Nano, Jetson Orin Nano, FPGA platforms

Muhammad Ibrahim

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PROFESSIONAL PROFILE

Electrical Engineer with a versatile technical foundation including Industrial Automation Control and Embedded Systems and Robotics/AI. Experience spans from optimizing manufacturing processes using PLC logic to designing integrated control architectures for autonomous robotics. Complemented by practical exposure to plant power operations, safety standards and Integrated Work Systems, reinforcing the capability to deliver functional, reliable engineering solutions across diverse environments.

EDUCATION

GCE A-level
Cadet College School System , Wah (2022)
BE Electrical Engineering
National University of Sciences and Technology , Islamabad , 3.53 (2026)

INTERNSHIP EXPERIENCE

Pakistan TobaccoCompanyLtd.
18-Jun-2025 - 01-Aug-2025

• Built and deployed smart weighing-conveyor logic using photo-eye and inductive proximity sensors with Allen-Bradley PLCs (RSLogix/Studio 5000), increasing conveyor throughput and stabilizing line flow. • Contributed to day-to-day operations of the power distribution team, coordinating the e**ffi**cient delivery of over 5 MWfrom solar and grid sources to maintain safe, reliable operation with minimal downtime • Supported SCADA operations across the plant; documented control loop parameters and fault recovery steps to reduce unplanned downtime and worked on a wide variety of industrial automation and instrumentation equipment

EmbedAIoT
03-Jun-2024 - 16-Aug-2024

Engineered a standalone defect detection unit for industrial materials (Leather) using computer vision on embedded Linux processors (Raspberry Pi), optimizing the software pipeline to enable continuous, real-time monitoring. Ported and deployed deep learning architectures onto highly constrained microcontrollers (STM32), utilizing model compression and hardware-specific tools (X-CUBE- AI) to fit advanced logic within strict memory limits.

Electronic SystemDesignAutomationCentre
10-Jun-2024 - 16-Aug-2024

Developed robust Linux drivers and hardware abstraction layers to enable seamless communication between the operating system and custom hardware peripherals, ensuring system stability and component compatibility. Designed a hybrid processing architecture that optimized system speed by o**ffl**oading complex tasks to specialized hardware logic, solving critical bottlenecks in real-time processing applications.

FINAL YEAR PROJECT

Visual Drone Tracking System

Engineered a fully autonomous multi-drone solution by integrating distinct subsystems (computer vision, flight control, and communications) into a single cohesive product, ensuring robust performance in dynamic environments. Tackled the challenge of running heavy AI workloads on limited hardware (Raspberry Pi) by optimizing software e**ffi**ciency, successfully achieving fail-safe, real-time operation without compromising system stability. Designed a rigorous "Simulation-First" testing protocol (utilizing Gazebo) to identify critical logic errors early, significantly accelerating the development lifecycle and preventing costly hardware failures during

field trials. Coordinated a multidisciplinary team (software, hardware, simulation) to bridge the gap between theoretical design and physical field tests, delivering a functional prototype within strict deadlines.

TECHNICAL EXPERTISE

Industrial Automation & PLC

Experienced in programming Allen-Bradley PLCs (RSLogix/Studio 5000) and managing SCADA workflows to optimize power distribution and conveyor throughput.

Robotics & Control Systems

Proficient in architecting distributed robotic frameworks using ROS 2 and implementing closed-loop PID control for autonomous navigation.

Embedded Firmware Development

Skilled in developing low-level drivers and real-time applications for ARM Cortex and STM32 architectures using C/C++ and FreeRTOS.

Computer Vision & Edge AI

Capable of training and deploying lightweight deep learning models (YOLO, TensorFlow Lite) on resource-constrained edge devices for real-time detection.

Power Systems & Industrial Safety

Practical exposure to HT/LT switchgear, hybrid power synchronization (Genset/Solar), operational compliance and safety in high-voltage environments

Abdul Hadi Afzal

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PROFESSIONAL PROFILE

Please update objective section.

EDUCATION

Primary Education + Olevels

Beaconhouse Jubilee Campus , Karachi , 8A*, 1A (2020)

Alevels

BCP , Karachi , 4A* (2022)

INTERNSHIP EXPERIENCE

K-Electric

01-Aug-2023 - 31-Aug-2023

During my internship at Kelectric Karachi, I had the opportunity to gain firsthand experience with various aspects of power plant operations. I actively observed the functionalities of the power plant and its intricate systems, gaining insights into its day-to-day operations. Additionally, I had the chance to work in a professional environment, collaborating with experienced professionals and contributing to ongoing projects. This internship provided me with valuable practical knowledge and skills in the power sector, furthering my understanding of the industry and preparing me for future endeavors in the field.

FINAL YEAR PROJECT

No project information available.

TECHNICAL EXPERTISE

Shehryar Khan

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate specializing in Photonic Integrated Circuits(PIC's) and Optical Signal Processing, with hands- on research in PIC design, testing and verification. Experienced in implementing digital signal processing and machine learning techniques to optical domain, in both design and processing stage. Additional experience is in the implementation of Machine Learning Techniques, and Neural Networks for Optical Signal Processing Purposes. Previous Projects include designing, simulating and optimizing thermally tuned Mach-Zehnder modulators, Multi-mode Interferometers, and Waveguide crossings using Lumerical FDTD, Tidy-3D, Matlab, and Python, while layouts were made in Klayout. Additional Experience in Machine Learning includes using Sci-kit Learn and TensorFlow to design and optimize delay lines in Photonic Chips for Optical Signal Processing. Strong interest in low- loss, high-fidelity photonic systems and emerging applications at the intersection of photonics, machine learning, and AI.

EDUCATION

Bachelor of Engineering

School of Electrical Engineering and Computer Science , Islamabad , 3.49/4.00 (2026)

INTERNSHIP EXPERIENCE

Laboratoire d'analyse et d'architectures des systèmes (LAAS) - Centre national de la recherche scientifique (CNRS) (Remote Position)

26-Aug-2025 - 22-Jan-2026

Design and optimization of Tunable Mach-Zehnder Modulators, Loop Mirrors, and Optical Ring Resonators for Optical Signal Processing Applications in Silicon Nitride Platform. Key tasks include initial modeling and theoretical calculations, design of physical structures such as waveguides, MZI's, and Photonic Circuits, simulation of components in Lumerical FDTD, and generation of physical layout for electron-beam lithography. Post-fabrication tasks include signal analysis, filtering and post-processing of results to extract key performance metrics such as group index, free spectral range, and self-reflection.

National University of Sciences and Technology - Electronic System Design Automation Centre (NUST - ESDAC)

12-Jun-2024 - 07-Sep-2024

Simulated and analyzed core photonic circuit components, including multimode interference (MMI) couplers, directional couplers, and grating couplers using MATLAB. Designed and optimized Mach–Zehnder interferometers based on MMI and directional coupler architectures on the SiO_2–Si–air platform. Key tasks include investigatation two-dimensional approximations of three-dimensional waveguide structures to evaluate modeling accuracy, and analysis of the impact of polarization states and wavelength variation on optical signal strength and device performance.

FINAL YEAR PROJECT

Thermally Tuned Mach-Zehnder Modulator Circuits for Optical Feedback Interferometry

Design of Mach-Zehnder Modulator Circuits for Sensing Applications, particularly Optical Feedback Interferometry for displacement sensing. This includes design of individual components for fabrication by electron beam lithography machine, characterization circuits to inspect and verify the fabrication process, and finalized circuit for integration with OFI circuits. Additional aspects include processing of the results, as characterized by Optical Spectrum Analyzer. Overall work included analytical calculations, simulation using Lumerical FDTD, Heat Solver, FDE, and Interconnect, Matlab, and Python, with Layouts made in Klayout, while processing of results was performed using Python and Matlab. Key domains include optical signal processing, photonic integrated circuit design, digital signal processing, and linear systems theory.

TECHNICAL EXPERTISE

Optical Signal Processing

Applicationof interferometric principles for optical feedback systems, phase modulation, and sensing. Performed post-simulation signal analysis, filtering, and numerical processing of output parameters to extract key performance metrics such as extinction ratio, insertion loss, phase shift, and free spectral ...

Computational Modeling and Scientific Programming

Strong proficiencyin Pythonand MATLAB for dataprocessing,datavisualization, and numerical modeling. Experience implementing using custom scripts using numpy and scipy for signal processing, filtering, and analysis of simulated and experimental photonic data.

Machine Learning

Experiencein usingMachine Learning Techniques and algorithms for optimization and data analysis. Key proficiencies include numpy, scipy, scikit-learn, and tensorflow for building neural networks and optimization scripts for signal processing applications.

Photonic Integrated Circuits

Design,simulation,and optimizationof photonic integrated circuits on silicon and silicon nitride (SiN) platforms, including waveguides, Mach–Zehnder interferometers (MZIs), multimode interference (MMI) couplers, directional couplers, grating couplers, waveguide crossings, loop mirrors, and ring resonators. ...

Cloud and Networking

Experience in networking tools (Wireshark, Cisco Packet Tracer) and remote system access via SSH, port forwarding, and virtual networking, in addition to supplementary networking courses from AWS. Implementations in cloud and ML platforms particularly, AWS SageMaker, Amazon S3, Redshift, and Microsoft Azure A ...

Microprocessors and Electric Circuit Design

Backgroundinanalogganddigitalcircuitdesign,simulation(LTspice, PSpice), and microcontroller-based systems using AVR and Arduino platforms. Experience with power electronics, digital logic design, and sensor-based embedded applications.

Muhammad Abdullah Asim

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate at NUST with a strong grasp of circuit and system design fundamentals. Experienced in developing, testing, and refining engineering solutions through academic and hands-on projects. Skilled at applying technical knowledge, logical thinking, and problem-solving approaches to address real-world engineering challenges and contribute e**ff**ectively in technical environments.

EDUCATION

Bachelors in Electrical Engineering

School of Electrical Engineering and Computer Sciences (SEECS) , Islamabad (2026)

INTERNSHIP EXPERIENCE

NUST Chip Design Centre, SINES

10-Jun-2025 - 29-Aug-2025

Completed an intensive training and project phase under the iFYP program in the domain of Analog IC Design on CMOS technology, focusing on schematic and layout design of integrated circuits using Cadence Virtuoso. Training covered DC characterization of MOSFETs, DC/Transient/AC analyses of single-stage and di**ff**erential amplifiers, current mirroring, biasing techniques, and introductory layout practices. Applied acquired skills to design the schematic and layout of a two-stage operational transconductance amplifier (OTA) with defined performance targets, gaining insights into design trade-offs and parameter optimization

ESDAC ResearchLaboratory,SEECS

17-Jun-2024 - 30-Aug-2024

Developed embedded Linux applications for Linux based DE1 SoC board by Intel, gaining hands-on experience in I/O operations, memory-mapped I/O, and kernel module development Implemented device drivers for various peripherals and custom FPGA hardware, enhancing embedded systems solutions

Crescent TextileMills,Faisalabad

11-Jul-2023 - 11-Aug-2023

Gained hands-on experience in power generation, transformer operations, and maintenance, working with various types of generators and learning key safety and reliability practices Developed practical skills in electronic instrument calibration, motor speed control, and troubleshooting electrical devices, while collaborating with engineers and technicians across multiple departments

FINAL YEAR PROJECT

LiDAR Analog Front-end Chip for Automotive Applications

This project focuses on the design of a low-power, high-performance LiDAR Analog Front-End (AFE) chip for automotive applications, addressing the growing demand for long-range, high-resolution, and energy-e**ffi**cient sensing systems in advanced driver-assistance and autonomous vehicles. The work targets key limitations in existing LiDAR receivers, particularly high input-referred noise in dual-gain Transimpedance Amplifiers (TIAs) under strong signal conditions and excessive power consumption in Analog-to-Digital Converters (ADCs). The proposed solution involves replicating and optimizing a dual-gain TIA architecture to improve noise performance while maintaining wide dynamic range, alongside redesigning the ADC using a more power-e**ffi**cient architecture that meets required linearity, resolution, and speed specifications. The project deliverables include complete schematic-level designs of the TIA and ADC blocks, detailed pre-layout and post-layout simulation results, integrated layout implementation, and performance validation against target specifications to demonstrate suitability for automotive LiDAR systems.

TECHNICAL EXPERTISE

Analog & Digital Circuit Design (Cadence, Verilog, FPGA)

Experience in CMOS analog ICdesignincludingMOSFETcharacterization, amplifier analysis, current mirrors, and two-stage OTA schematic and layout using Cadence Virtuoso, along with Verilog-based digital design and FPGA workflows using Quartus and Vivado

Embedded Systems & SoC Development (Linux, RTOS, MCUs)

Hands-on workwith embeddedLinuxand SoCplatformsincludingmemory-mapped I/O, device drivers, and kernel modules on Intel DE1-SoC, as well as microcontroller-based system development using STM32, ESP32, Arduino, and FreeRTOS for sensor-driven applications

Signal Processing & System Analysis (MATLAB)

AppliedMATLABforFIRfilterdesignandsignalanalysis,including speech-band filtering, energy-based frame classification, and performance validation

Circuit Simulation & Verification Tools

UsedPSpiceandProteusforelectroniccircuitsimulation and verification in academic and project-based work

Programming & Low-Level Computing

ProficientinC,C++,andAssemblyforembeddedprogramming, hardware interaction, and system-level development

Electrical Systems & Industrial Exposure

Practical exposuretopowergeneration, transformers, motor control, instrument calibration, and electrical troubleshooting during industrial internship

Technical Documentation & Communication

Experiencedinpreparingtechnicalreports,designdocumentation, and presentations using Word, PowerPoint, Visio, and Canva

Abdul Hannan Adil

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate with strong hands-on experience in processor microarchitecture, FPGA-based system design, and hardware implementation of cryptographic algorithms. Proven capability in designing and verifying RISC-V processors (single-cycle and pipelined), integrating SoC components, and developing secure hardware accelerators for post-quantum IoT applications. Currently serving as an Undergraduate Research Assistant, working on high-performance, area-efficient implementations of Post Quantum Cryptographic Algorithm with a focus on throughput optimization and side-channel security. Demonstrates practical problem-solving ability, continuous learning, and a research-driven approach to digital system and processor-level security design. To continue my passion and contribute to open source, I have a Github repository, below is my attached Github Repositry.

https://github.com/abdulhannanadil

EDUCATION

BE Electrical & Electronics Engineering

SEECS , Islamabad (2026)

INTERNSHIP EXPERIENCE

LT Engineering

12-Aug-2024 - 12-Sep-2025

During my 4 weeks internship at LT Engineering, Fiber-Optic Cable Manufacturing Company, I learned following things: 1. Harnessing and lathing its importance and how it's done. 2. Fiber Optical Cable Manufacturing 3. Fiber Testing 4. HVAC Systems

Research AssistantatSystemsonChipLab

01-Jul-2025 - 01-Jun-2026

As a research assistant I am currently working and researching on: - Post Quantum Cryptographic Algorithm for IoT - Implementation of Hardware Accelerator for Post Quantum Cryptographic Algorithm for IoT - Making the Hardware Accelerator secure from Side Channel Attacks

FINAL YEAR PROJECT

Ascon - 128 Cryptographic Engine on STM 32

Tools: Embedded C, STM32CubeIDE, STM32F429 - Implemented the Ascon -128 A authenticated encryption algorithm in C and ported it to an STM32F429 microcontroller - Adapted the reference implementation for embedded constraints, focusing on memory efficiency and execution correctness - Integrated encryption and decryption routines with on-board peripherals to demonstrate real- time operation - Validated functional correctness through test vectors and live input/output visualization on the LCD interface - Analyzed execution behavior and resource usage to ensure suitability for constrained embedded environments

Digital Twin Based Side-Channel Attack Prediction System using CNN

In this project, I created a digital twin environment for obtaining, the Realtime dataset for Side Channel Attack. For this we used Rainbow Side Channel Attack prediction software, linked it with our Ascon - 128 A implementations, and created a digital twin to recover the key. If the key was recovered it was assigned a zero label and if it was unable to recover the key it was assigned one. Then using the CNN, we predicted that the given code is Side Channel Attack resistant or not.

Secure Hardware Accelerator for Post-Quantum IoT

Designed and optimized a hardware accelerator for the Ascon -128 authenticated encryption algorithm targeting resource-constrained

IoT devices. This projected included implementation a round-based architecture (a hybrid architecture comprising of loop unroll, and multi-cycle) with e**ffi**cient memory utilization to achieve a favorable area-throughput trade-o**ff**. Integrated streaming data paths and optimized control logic to improve performance while minimizing hardware overhead. We successfully achieved hardware utilization which was 0.5 times more area efficient then the latest implemented Hardware Accelerator as per IEEE Xplore.

RISC-V 32-bit Single-Cycle Processor

Designed a complete RV32I single-cycle processor starting from the ISA specification. Implemented instruction fetch, decode, execute, memory access, and write-back logic within a unified cycle. Developed control logic to correctly handle data hazards, forwarding paths, and pipeline flush conditions. Verified functionality through simulation and waveform-level analysis.

RISC-V 32-bit Five-Stage Pipelined Processor

Extended the single-cycle RISC-V design into a five-stage pipelined microarchitecture consisting of IF, ID, EX, MEM, and WB stages. Implemented hazard detection, data forwarding, and control-flow handling mechanisms to maintain correctness under pipelined execution. Evaluated performance improvements by analyzing throughput gains over the single-cycle design.

RISC-V 32-bit Pipelined Processor with Static (Tournament) Branch Prediction

Enhanced the five-stage pipelined RISC-V processor by integrating a static tournament branch prediction mechanism. Reduced control hazards and branch penalties by predicting branch outcomes earlier in the pipeline. Verified correctness and analyzed the impact of prediction on pipeline stalls and control-flow recovery through simulation.

RISC-V 32-bit Pipelined Processor with Dynamic Branch Prediction

Implemented dynamic branch prediction techniques within a pipelined RV32I processor to improve prediction accuracy during program execution. Designed prediction and update logic to adapt to runtime behavior and reduce misprediction penalties. Evaluated the effectiveness of dynamic prediction by comparing pipeline performance against static prediction approaches.

RISC-V SoC Design with Bootloader Support

Integrated the 5 - Staged already developed and extended the RISC-V processor core into a functional system-on-chip design with UART communication support. Implemented a boot loading mechanism by initializing program memory with firmware, enabling autonomous program execution after reset. Verified correct clock, reset, and peripheral interaction through detailed simulation and system-level testing.

RTL-Based Implementation of AES

Designed register-transfer-level implementations of AES-128, AES-256, and AES-512 encryption and decryption engines. Verified functional correctness using NIST-specified test vectors and internal consistency checks. Ensured correct operation across multiple key sizes through systematic simulation and validation.

Communication Protocols on STM32 Using HAL

Implemented SPI, I2C, and UART communication protocols on an STM32 microcontroller using a hardware abstraction approach. Configured peripherals and validated reliable data transfer through functional testing. Gained hands-on experience in embedded communication and low-level peripheral control.

TECHNICAL EXPERTISE

Processor Microarchitecture & RISC-V Design

Strong understanding of RISC-V ISA and processor microarchitecture through hands-on design of single-cycle and multi-stage pipelined RV32I cores. Experienced in implementing instruction fetch, decode, execute, memory, and write-back stages along with hazard detection, forwarding, and control-flow management.

FPGA-Based System Design

Hands-on experience designing and simulating hardware systems targeting FPGA platforms. Worked on system-level integration, memory interfacing, and performance optimization using simulation-driven validation to ensure correct timing, reset behavior, and data flow.

Communication Protocols & Peripheral Interfacing on Micro Controllers

Implemented SPI, I2C, and UART communication protocols using a hardware abstraction approach. Configured microcontroller peripherals and validated reliable data transfer through systematic functional testing and debugging.

Muneeb Ur Rehman

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PROFESSIONAL PROFILE

I am a final-year Electrical Engineering undergraduate at the National University of Sciences and Technology (NUST), Islamabad, with a strong interest in building and understanding systems end-to-end. My academic and project experience has given me exposure to embedded systems, digital design, and intelligent hardware, software integration, while my broader interests have pushed me to think beyond isolated technical problems and consider how engineering solutions operate in real-world, constrained environments.

What di**ff**erentiates me is my inclination toward leadership, structured problem-solving, and adaptability. I enjoy learning new technical domains quickly, understanding how di**ff**erent components of a system interact, and working with people to turn ideas into practical outcomes. Rather than focusing narrowly on one tool or role, I aim to develop as a versatile engineer who can grow across technical, research, and cross-functional responsibilities.

Alongside my technical foundation, I have been actively involved in community-oriented initiatives and leadership roles, which has shaped how I approach engineering problems, with responsibility, awareness of societal impact, and long-term thinking. I am particularly interested in sustainability-aware engineering and the evolving intersection of technology, energy systems, and responsible innovation, and I continue to explore how engineers can contribute meaningfully in these areas.

I am currently seeking graduate-level opportunities where I can apply my engineering fundamentals, learn from experienced teams, and grow into roles that require both technical depth and leadership potential.

EDUCATION

Bachelors in Electrical Engineering

SEECS , islamabad (2026)

INTERNSHIP EXPERIENCE

Islamia UniversityofBahawalpur

10-Jun-2025 - 01-Sep-2025

Research Internship - RISC-V Based Low-Power AI & Neuromorphic Systems ●Conducted an in-depth literature review of RISC-V-based edge AI and neuromorphic accelerator architectures for real-time visual detection applications. ●Analyzed and compared low-power AI inference techniques, focusing on e**ffi**ciency, latency, and hardware-software co-design trade-o**ff**s. ●Studied neuromorphic computing concepts (event-driven processing, spiking models) and their relevance to energy-e**ffi**cient vision systems. ●Investigated existing AI accelerator and edge-vision research papers to identify reproducible methodologies and research gaps. ●Assisted in reproducing and validating results from selected peer-reviewed studies to establish a strong experimental baseline. ●Explored RISC-V ISA and system-level integration for embedded AI workloads, emphasizing open-source ecosystems. ●Documented findings in a structured technical report and research manuscript, adhering to academic and IEEE-style standards. ●Demonstrated strong research planning, independent learning, and technical documentation skills throughout the internship.

FINAL YEAR PROJECT

RISC-V-Controlled SNN Processor for Real-Time Sensor Data Analysis on Low-Power FPGAs

In this project, we are designing and implementing a low-power neuromorphic accelerator for Spiking Neural Networks (SNNs) targeted at real-time sensor data processing on embedded platforms. Conventional deep learning models are often unsuitable for wearable and near-sensor systems due to their high computational and energy requirements. SNNs provide a more energy-e**ffi**cient alternative by processing information through sparse, event-driven spikes, making them well-suited for time-varying sensor signals.

Our work focuses on implementing an SNN inference engine on a low-cost FPGA, supported by event-based temporal encoding to convert continuous sensor signals into spike trains. The SNN core is based on leaky integrate-and-fire neurons and employs fixed-point arithmetic and sparsity-aware computation to reduce unnecessary operations. A lightweight RISC-V controller is integrated to manage input/output communication, system configuration, and power control, improving flexibility while keeping hardware overhead minimal. The architecture is being developed to support configurable encoding and decoding modules, allowing the system
to adapt
to di**ff**erent sensor modalities such as ECG, EEG, and EMG. The current implementation pipeline includes model training in software, quantization for hardware execution, and verification through simulation. Based on existing evaluations and prior work, we expect the proposed system to achieve performance comparable to state-of-the-art SNN approaches while operating within a very low power budget suitable for wearable and edge-AI applications. Ongoing work focuses on completing hardware verification, integration, and performance evaluation to validate these expectations.

TECHNICAL EXPERTISE

Embedded Systems & Microcontrollers

Hands-on experience designing and implementing microcontroller-based systems using Arduino and STM32 platforms. Proficient in sensor interfacing, actuator control, PWM, ADC/DAC integration, and real-time firmware development. Capable of building end-to- end prototypes from signal acquisition to actionable outp ...

Digital Logic & FPGA Design

Strong foundation in digital system design, combinational and sequential circuits, finite state machines, and timing analysis. Experienced in FPGA-based projects including implementation of custom signal processing modules and small-scale digital accelerators. Skilled in Verilog HDL for hardware modeling and ...

Computer Architecture & Hardware-Software Integration

Understanding of processor design, instruction execution, memory hierarchies, pipeline concepts, and resource optimization. Experienced in mapping software algorithms to hardware constraints and optimizing embedded systems for low-power, high- efficiency execution.

Programming & Software Development

Proficient in C/C++ for firmware and system-level programming. Experienced in Python for data analysis, scripting, and ML prototyping. Familiar with MATLAB for signal processing and modeling, and comfortable with Linux environments

Machine Learning & Data Analysis

Hands-on experience with machine learning workflows, including data preprocessing, model training, and evaluation. Familiar with Python-based ML libraries and applying ML techniques to signal and sensor data for predictive analysis, classification, and regression tasks.

Signal Processing & Sensor Data Systems

Practical experience in real-time acquisition and processing of signals, including ECG, EMG, ultrasonic, and iEEG datasets. Skilled in delta modulation, filtering, spike encoding, and feature extraction for both classical signal analysis and neuromorphic systems.

FPGA, Hardware Acceleration & Neuromorphic Computing

Experience in FPGA-based SNN accelerators, integrating RISC-V controllers, sparsity-aware processing, and low-power neuromorphic pipelines. Exposure to hardware-software co-design, quantization-aware models, and event-driven processing.

Project Development & System Integration

Successfully executed multiple end-to-end projects, including: Ultrasonic Radar System – Real-time object detection using ultrasonic sensors Smart Electronic Voting System – Secure microcontroller-based voting system with tamper-proof design Load-Sharing Transformer System – Balanced power distribution des ...

Leadership, Collaboration & Research Exposure

Demonstrated leadership through team-based technical projects, community initiatives, and project coordination. Experienced in guiding teams, organizing workflows, and mentoring peers. Exposure to research methodologies in embedded intelligence and sustainable engineering solutions.

Abdussalam Sarmad

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PROFESSIONAL PROFILE

Motivated Electrical Engineering undergraduate with strong hands-on experience in embedded systems, microcontrollers, and IoT-based projects. Proficient in Arduino and ESP32, with practical exposure to motor control, digital electronics, and circuit design. Actively exploring AI and machine learning applications to build intelligent, real-world engineering solutions.

EDUCATION

Electrical Engineering

School of Electrical Engineering and Computer Sciences (SEECS) , Islamabad , 2.89 (2026)

INTERNSHIP EXPERIENCE

RIMMS , NustH12(TUILLab)

21-Jul-2025 - 21-Sep-2025

During my internship, I worked on developing a contactless bioradar system to monitor vital signs. I conducted a detailed literature review, planned the system methodology, and got hands-on experience with the TI AWR6843AOP radar module. I helped set up the hardware, collected test data alongside a medical reference device, and implemented basic software to process and visualize respiration and heartbeat signals. This experience gave me practical knowledge in radar systems, signal processing, and experimental testing, while establishing a solid foundation for the next stages of the project.

FINAL YEAR PROJECT

Vital Signs Monitoring using MM-Wave radar technology

This project focuses on developing a non-contact system to monitor human vital signs using a 60 GHz millimetre-wave radar and a Raspberry Pi. Chest wall movements are captured to estimate respiration rate, heart rate, and heart rate variability through digital signal processing techniques such as filtering and peak detection. The system processes data in real time and uploads results to a web-based interface for remote monitoring. The aim of the project is to provide a safe, accurate, and privacy-friendly alternative to conventional contact-based health monitoring systems, particularly for clinical and telemedicine applications.

TECHNICAL EXPERTISE

Embedded Systems & IOT

I have a strong technical background in embedded systems and microcontroller-based development, with hands-on experience using Arduino and ESP32 for real-world applications. My expertise includes digital electronics, circuit design and analysis, and RTL/Verilog-based digital design. I am proficient in C, C++, ...

Sataish Elahi

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate from NUST with strong interests in digital system design, computer architecture, FPGA-based development, and embedded systems. Experienced in designing pipelined RISC-V processors, FSM-based hardware systems, and simulation-driven engineering projects. Seeking graduate-level opportunities to apply hardware design, verification, and system integration skills in research or industry-focused engineering roles.

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 3.53 (2026)

INTERNSHIP EXPERIENCE

NUST Chip Design Centre

23-Feb-2025 - 29-Aug-2025

Designed and implemented an FSM-based anti-theft car system on FPGA using SystemVerilog in Vivado, with emphasis on reliable state transitions and real-time operation. Developed a 32-bit RV32I RISC-V processor core featuring a five-stage pipelined architecture with data and control hazard detection and resolution. Integrated instruction memory, data memory, and peripheral modules using the Wishbone bus to enable complete SoC-level functionality. Verified system correctness through simulation, waveform analysis, and comprehensive testbenches.

FINAL YEAR PROJECT

Performance Enhanced RISC-V Vector Processor

The project involves upgrading an existing RISC-V processor implementation by designing and integrating a vector coprocessor to accelerate data-parallel computations. It focuses on enhancing performance through improved vector execution support while maintaining compatibility with the base RISC-V architecture. The work includes architectural modifications, coprocessor integration, and optimization of vector operations. Performance evaluation is carried out using simulation and benchmarking to assess speedup, efficiency, and scalability.

TECHNICAL EXPERTISE

Programming & Hardware Description Languages

C, C++, Python, RISC-V Assembly, Verilog, SystemVerilog, MATLAB

Design and Simulation Tools

Vivado, Quartus Prime, ModelSim, Xilinx Xcelium, PlatformIO IDE, Proteus, PSpice, LTSpice, Simscape Multibody, Mbed Studio, Verilator

Muhammad Saad Farooq

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PROFESSIONAL PROFILE

Final-year undergraduate Electrical Engineering student at NUST with strong interests in RTL design, computer architecture, embedded systems, FPGA-based design, and AI accelerators. Experienced in Verilog-based digital design, FPGA development, and machine learning through hands-on internships and academic projects. Seeking opportunities to apply hardware–software co-design, AI acceleration, and digital system design skills in research-oriented or industry environments.

EDUCATION

Bachelors Electrical Engineering

School of Electrical Engineering & Computer Sciences , Islamabad (2026)

INTERNSHIP EXPERIENCE

Nationa l EngineeringComplexofPakistan

24-Jun-2025 - 23-Nov-2025

Designed and verified combinational and sequential digital circuits (logic gates, flip-flops, FSMs) using Verilog, strengthening RTL design and verification skills. Developed FPGA-based projects using Xilinx Vivado IPs and prepared structured documentation and presentations explaining design flow and functionality. Integrated and tested communication protocols including I2C, SPI, and UART, gaining hands-on debugging and interfacing experience. Improved design e**ffi**ciency and reliability through modular coding practices and systematic testing.

Machine LearningIntern–DigitalEmpowermentPakistan

05-Feb-2023 - 06-Mar-2023

Gained practical experience in AI, Machine Learning, Deep Learning, CNNs, and image processing. Worked with PyTorch, TensorFlow, and Google Colab for model development and optimization. Used Python for data preprocessing and image analysis tasks.

FINAL YEAR PROJECT

High-Speed AI Accelerator for Real-Time Applications

Designing and implementing an FPGA-based AI accelerator on the Xilinx ZCU102 platform for real-time deep learning workloads. Optimizing convolution layers and MAC processing elements using a systolic array architecture to achieve high throughput and low latency. Evaluating accelerator performance against CPU/GPU implementations in terms of speedup, resource utilization, and accuracy. Targeting real-time deployment of vision-based AI models such as YOLOv8. Tools & Technologies: Verilog HDL, Xilinx Vivado, ZCU102 FPGA, AI/ML Models

TECHNICAL EXPERTISE

RTL & FPGA Design

RTL Design, Verilog HDL, SystemVerilog, Computer Architecture, RISC-V Processor Design, Digital System Design, Hardware Verification, AXI Interface, Systolic Array Architecture, FPGA Implementation

Embedded Systems

Embedded C, Microcontroller Programming, GPIO & Peripheral Interfacing, I2C, SPI, UART Microcontrollers: Arduino, ATmega328P, ATmega16A, STM32, ESP32 Tools: Arduino IDE, Atmel Studio, STM32CubeIDE

Machine Learning
Supervised&Unsupervised Learning, Linear & Logistic Regression, Decision Trees, SVM, K-Nearest Neighbors, Clustering, Dimensionality Reduction (PCA), Feature Extraction, Data Cleaning & Preprocessing

Deep Learning
ArtificialNeural Networks (ANNs), Convolutional Neural Networks (CNNs), PyTorch, TensorFlow, Keras, NumPy, Pandas, Matplotlib, Model Training & Optimization

Computer Vision
Image Processing, Filtering, Edge Detection (Canny), Feature Detection, Object Detection (YOLO), Image Segmentation, Optical Flow, Vision-Based Applications

Development Tools & Platforms
Git& GitHub, VSCode,JupyterNotebook,Google Colab, MATLAB & Simulink, Proteus, NI Multisim, PSpice, LabVIEW, AutoCAD, Venus RISC-V Simulator

Sarah Ali

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate student at NUST with a strong drive for innovation, design excellence, and practical problem-solving. Brings a multidisciplinary technical background with strong proficiency in Autodesk Fusion 360 and hands-on experience in embedded systems. Through carefully selected electives, has developed a focused academic orientation toward embedded systems and machine learning. Demonstrates a solid ability to design, analyze, and integrate complex engineering systems, with a proactive approach to learning and applying emerging technologies.

Final Year Project centered on the complete design and development of a courier drone, encompassing a fully original airframe design and end-to-end real-time system integration. Gained in-depth experience with flight controllers, PID control, sensor interfacing, motor control, and real-time embedded systems, contributing to the successful development of a reliable UAV platform.

Additionally, has professional experience as a Software Quality Assurance Engineer, with hands-on exposure to both manual and automation testing. Recognized as a reliable team contributor with strong collaboration skills, attention to detail, and a commitment
to delivering high-quality, robust engineering solutions in real-world environments.

EDUCATION

Bachelor of Electrical Engineering - BEE

SEECS - School of Electrical Engineering and Computer Science , Islamabad , 3.21 (2026)

INTERNSHIP EXPERIENCE

9T5 Pty Ltd

22-Jul-2024 - 02-Sep-2024

Performed manual testing across web applications, identifying bugs, UI issues, and performance gaps. Designed and executed detailed test cases and implemented automation scripts using Selenium WebDriver with Java.

DroNext PvtLtd

23-Jun-2025 - 01-Sep-2025

Created fusion design of - Courier Drone - Food delivery drone - Motor design - Drone Flight testing cage - Multiple Storage boxes - Animating projects. Hands-on experience with drone systems, including flight controllers, PID control, sensor integration, and motor control.

FINAL YEAR PROJECT

PARWAAZ: Courier Drone

Developed an autonomous courier drone integrating computer vision–based human detection and OTP-authenticated parcel delivery. The system combines embedded avionics, navigation, and a servo-based dispensing mechanism for secure, intelligent last-mile delivery.

TECHNICAL EXPERTISE

Design & Modeling (Autodesk Fusion 360)

Proficient in 3D design, modeling, and simulation with experience in creating assemblies, functional animations, and engineering prototypes. Worked on projects including courier and food delivery drones, motor design, flight testing cages, modular storage solutions, and an independent design projects.

Programming Languages – Python | C++ | C | Java

Proficient in software development for embedded systems, robotics, computer vision, and data-driven applications, with expertise in algorithm design, object-oriented programming, firmware development, hardware integration, and real-time system implementation for UAVs, drones, and automation projects.

Software Quality Assurance & Automation Testing

Experienced in automation testing using Selenium with Java, developing and executing test scripts for web applications.Manual testing to identify bugs, UI inconsistencies, and performance issues across multiple applications. Skilled in writing detailed test cases.

Embedded systems - FPGAs | Verilog | Assembly Language | Quartus

Experienced in designing and developing embedded and real-time systems with microcontrollers (AVR, STM32, Arduino) and FPGA platforms using C/C++, Assembly, and Verilog.

AI - Machine Learning | Deep Learning | Computer Vision

Experienced in applying machine learning and deep learning for computer vision tasks such as human detection and object recognition in robotics and autonomous systems. Skilled in developing and integrating vision-based AI models with embedded platforms for real-time intelligent decision-making.

MATLAB

Proficient in MATLAB with hands-on experience from multiple lab courses, using it for simulations, data analysis, plotting, and algorithm implementation in control systems, signal processing, and embedded system applications.

UAVs - Pixhawk | QGC | PID | GSM modules

Experienced in UAV systems with hands-on expertise in flight controllers, sensor integration, and PID-based attitude stabilization, including a custom bicopter flight controller project. Skilled in IMU integration, ESC motor control, and configuring ArduPilot and ground control stations.

Muhammad Umer Haroon

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PROFESSIONAL PROFILE

I am an ambitious final year **Electrical Engineering** student at **NUST** with a strong background in **Computer Vision, AI, robotics systems, and digital/embedded design**. I have worked on a range of academic and internship projects including vision-based pipelines, machine learning models, and a **ROS2**-based autonomous robotic system for my Final Year Project. I have a solid foundation in circuit design, microcontrollers, and system-level engineering, and I enjoy combining software, algorithms, and hardware concepts to build practical, real-world systems. I bring strong problem-solving, teamwork, and leadership skills, with experience in technical documentation, project coordination, and delivering complex systems under academic deadlines.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3.15 (2026)

INTERNSHIP EXPERIENCE

Systems Limited

10-Jun-2025 - 07-Aug-2025

During my AI/Data Science internship, I worked extensively on data preprocessing, cleaning, and exploratory data analysis (EDA) using Python, Pandas, NumPy, Matplotlib, and Seaborn. I developed and evaluated machine learning models for classification tasks and worked with real-world datasets from Kaggle and other sources. I fine-tuned BERT-based models for NLP tasks including spam classification and named entity recognition, and implemented model evaluation and explainability using techniques such as SHAP and LIME. I also worked with sentence embeddings (SBERT) for semantic similarity and clustering, gaining hands-on experience in building end-to-end data-driven and AI pipelines using Jupyter Notebook and VS Code.

FINAL YEAR PROJECT

Lidar-Guided Rover for Landmine Detection

My Final Year Project is a ROS2-based LiDAR-guided autonomous ground rover designed for navigation in hazardous and disaster affected environments. The system integrates 2D LiDAR, SLAM, the Nav2 navigation stack, costmaps, and path planning to perform autonomous mapping, localization, and obstacle avoidance in unknown environments. The rover is developed and tested in Gazebo and visualized in RViz using a modular perception and navigation architecture that supports future sensor integration, including metal detectors and thermal cameras for landmine detection and human presence detection. The project emphasizes safe and reliable autonomous navigation, scalable system design, and real world applicability in high risk areas.

TECHNICAL EXPERTISE

Computer Vision & Image Processing: OpenCV, Feature Matching, Optical Flow, Homography

Experience building vision pipelines for motion analysis, objecttracking, feature extraction, and geometric transformations using Python and OpenCV.

Machine Learning & Deep Learning: scikit-learn, PyTorch, HuggingFace Transformers

Experience in training, fine-tuning, and evaluating machine learning and deep learning models for classification and NLP tasks using real-world datasets.

Robotics & Autonomous Systems: ROS2, SLAM, Nav2, Gazebo, RViz

Experience developing and simulating autonomous navigation systems using LiDAR-based SLAM, path planning, localization, and

obstacle avoidance.

Embedded & Digital Systems: Arduino, STM32, Digital Logic, Microcontrollers

Experience with embedded system development, hardware interfacing, and digital system design through academic projects.

Programming & Development Tools: Python, C/C++, MATLAB, VS Code, Jupyter Notebook

Comfortable writing clean, modular code and building experimental and data-driven projects in both research and engineering workflows.

Documentation & Productivity Tools: Microsoft Word, Excel, PowerPoint, Canva

Experienced in preparing technical reports, project documentation, presentations, and structured data sheets for academic and team projects.

Bushra Naeem

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PROFESSIONAL PROFILE

A highly motivated and driven final-year Electrical Engineering student at NUST with a strong academic foundation and a passion for innovation at the intersection of hardware and intelligent systems. Possesses hands-on research experience in control systems, complemented by practical knowledge in coding, Artificial Intelligence (AI), and Machine Learning (ML). Eager to apply a robust theoretical understanding and technical skills to develop advanced, data-driven solutions in robotics, automation, or intelligent systems engineering. A dedicated learner seeking to contribute to and grow within a forward-thinking engineering team.

EDUCATION

Electrical Engineering

NUST H-12 SEECS (School of Electrical Engineering and Computer Science) , Islamabad , 2.4 (2026)

INTERNSHIP EXPERIENCE

Undergraduate Researcher — Graduate Research Complex, SEECS – NUST

20-Sep-2024 - 20-Sep-2025

This research investigates optimized nonlinear control for modeling brain tumor dynamics in response to treatment. We propose a robust control framework based on Sliding Mode Control (SMC), with parameters optimized using a hybrid metaheuristic approach combining the Red Fox Optimization (RFO) algorithm and Parallel Particle Swarm Optimization (PPSO) to enhance convergence and therapeutic precision. To facilitate real-time computational feasibility, the optimized controllers are encapsulated within e**ffi**cient Artificial Neural Network (ANN) and Bidirectional LSTM (BiLSTM) surrogate models. Extensive simulations in MATLAB/Simulink validate the system's performance in trajectory tracking (tumor suppression) and disturbance rejection (modeling biological noise), with quantitative evaluation using IAE, ISE, and ITAE metrics. Results demonstrate that the proposed method e**ff**ectively minimizes control chattering and improves tracking accuracy, o**ff**ering a novel computational strategy for optimizing nonlinear therapeutic protocols in neuro-oncology.

FINAL YEAR PROJECT

PAYTKN - A Decentralized Ecosystem for Global Payments & Merchant Infrastructure

The PAYTKN ecosystem is a decentralized infrastructure designed to solve the high costs and fragmentation of global payments by connecting users, merchants, and subscriptions within a single stable economy. It enables users to make fast, low-fee transactions while earning rewards, and allows merchants to accept crypto seamlessly in a unified token, avoid conversion fees, and earn through staking. The system is powered by its native $PAYTKN token, which is supported by a sustainable token economy featuring buybacks,

a tax-to-treasury mechanism, and balanced minting logic to ensure long-term price stability and liquidity. By integrating cross-chain tools like LI.FI and a self-sustaining treasury that funds staking rewards and ecosystem growth, PAYTKN bridges DeFi with real-world usability, creating a scalable, incentive-driven payment standard for global adoption.

TECHNICAL EXPERTISE

Programming and Tools

Languages: Python, C/C++, MATLAB/Simulink, Embedded C AI/ML Simulation & Modeling: MATLAB/Simulink, Machinations, Version Control & Collaboration: Git, GitHub, LaTeX Tools & Framwork: LI.FI, Hardhat/Foundry, ethers.js/web3.js, MetaMask/WalletConnect

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate at NUST with hands on experience in embedded systems, control and motor drive applications, MATLAB/Simulink modeling, and interdisciplinary projects in machine learning and computer vision. Skilled in microcontroller-based system design, automation, and data-driven problem solving, with research exposure to sliding mode control. Seeking to apply strong analytical and practical skills in challenging engineering roles.

EDUCATION

bachelors in electrical engineering

seecs , Lahore , 2.3 (2026)

INTERNSHIP EXPERIENCE

Graduate ResearchComplex

16-Jun-2025 - 05-Sep-2025

Wrote a Research Paper on Bone Cancer Treament using Sliding Mode Control

FINAL YEAR PROJECT

OLIVE YIELD DETECTION USING COMPUTER VISION AND EDGE COMPUTING

This final year project focuses on olive yield detection using computer vision and edge computing to provide an e**ffi**cient, accurate, and real-time solution for olive production estimation. The system uses image data captured from cameras or mobile devices to automatically detect and count olives on trees using computer vision techniques such as image processing and deep learning based object detection. To ensure low latency, reduced bandwidth usage, and on-site processing, the model is deployed on an edge computing device (NVIDIA Jetson Nano). This approach helps farmers and agricultural planners estimate yield early, optimize harvesting strategies, reduce labor costs, and support data-driven decision-making in precision agriculture.

TECHNICAL EXPERTISE

Embedded Systems and MicroControllers

STM32 microcontroller programming Arduino-based system design Embedded C programming GPIO control, relay interfacing Real-time control of hardware systems

Control Systems And Motor Control

Research Paper on Bone Cancer Treatment using SMC (Sliding mode Control). (Under Review) DC motor speed control Robotic Arm using Servo Motors

Machine Learning & Python

Salary Prediction Model - Predicting Salary based on the persons job title, location, remote or on-site - by using Python Dog Breed Identification - Predicting a Dog's Breed by putting photographs in it of different dogs - by using Python on Google Colab

Computer Vision

White Board Digitizer - image processing, edge detection, object recognition Dog Breed Identification - using Machine learning and Computer vision to detect the breedof Dog.

Muhammad Danish Khattak

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PROFESSIONAL PROFILE

AI and Computer Networking Engineer with hands-on experience in AI-driven optimization, wireless communication systems, and network performance analysis. Skilled in Python, MATLAB, Deep Learning, and simulation-based evaluation of 5G/6G, computer and IoT networks.

EDUCATION

BS Electrical Engineering

School of Electrical Engineering & Computer Science (SEECS) , Islamabad , 3.76 (2026)

INTERNSHIP EXPERIENCE

Bravo Health,NewYork,USA

15-Jan-2025 - 08-Sep-2025

• Collaborate with the ML team to build predictive pricing and recommendation systems using LLMs (DeepSeek, Qwen, Claude) APIs and LoRA fine-tuning on large-scale healthcare datasets. • Develop scalable, low-latency pipelines with feature engineering on historical coverage and operational data to enhance model accuracy and relevance.

TUKL Research and Development Lab (NUST)

15-May-2024 - 30-Aug-2024

• Contributed to the implementation of an EEG abnormality detection pipeline with advanced signal processing (band-pass filtering, ICA artifact removal) and statistical feature extraction (PSD, Hjorth parameters, entropy). • Co-Trained and evaluated supervised ML models (SVM, Random Forest) using k-fold cross-validation, optimizing for AUC and F1-score to improve diagnostic accuracy.

InformationProcessingandTransmissionLab(IPT) | ResearchAssistant

30-Aug-2026 - 19-Jan-2026

• Pioneering novel network architectures and analyzing their performance using simulations and analytical techniques. • Conducting research aimed at tackling the evolving challenges in next-generation wireless networks. • Exploring and evaluating the feasibility of machine learning, particularly deep reinforcement learning, for optimizing future mobile networks.

FINAL YEAR PROJECT

Optimization of NOMA-Enabled Backscatter Communication Using Deep Reinforcement Learning in Diver RIS-Aided Networks

Designed and implemented an AI-driven framework for optimizing next-generation wireless communication systems. Developed Python-based simulation environment for NOMA-enabled and RIS-assisted networks and applied deep reinforcement learning dynamic power allocation and resource management. Evaluated system performance using key telecom metrics including throughp energy e**ffi**ciency, and reliability. The outcomes of this work were accepted for publication and presentation at leading IEEE wireless communication venues, demonstrating technical quality and real-world relevance. This project strengthened practical skills in wireless system modeling, optimization, and AI-enabled network design.

TECHNICAL EXPERTISE

Skills

Languages: Python, C/C++, MATLAB, Verilog, LATEX Libraries & Frameworks: PyTorch, TensorFlow, scikit-learn, RLlib, TorchRL, NumPy, pandas, SciPy, OpenCV, Matplotlib, LangChain, Git, TensorBoard Design and Simulation Tools: ModelSim, Proteus,

LTspice, MATLAB/Simulink, LabView, Arduino IDE

Aneeq Ur Rehman

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PROFESSIONAL PROFILE

Electrical Engineering graduate from NUST with hands-on experience across hardware design, applied software development, and research-driven engineering. Worked with Korea EHT on automating industrial workflows using Python and AI, including CAD drawing processing, ambient temperature data pipelines, and rule-based recommendation systems that removed large amounts of manual effort for EPC clients. Experience spans both structured internships and independent contracting.

Research experience includes physical-layer modeling of optical networks at ONT Lab, NUST, with OptiSystem MATLAB co-simulations and implementation of sigma-delta modulator–based systems for 5G/C-RAN links. Strong background in digital and ASIC design, including RTL development, microarchitecture design of a RISC-V core, and an ongoing final-year project focused on a hardware accelerator for the NTT in CRYSTALS-Kyber.

Comfortable working across the stack from embedded C/C++ and RTOS to Python, Verilog/SystemVerilog, and PyTorch, while balancing independent problem-solving with collaborative research and mentoring junior team members.

EDUCATION

Electrical Engineering(EE)

SEECS , ISLAMABAD , 3.33 (4)

INTERNSHIP EXPERIENCE

Korea EHT

09-Jul-2025 - 25-Jan-2026

Designing algorithms and developing for company’s heat trace CAD drawing’s automated processing using AI, as an independent contractor.

Korea EHT

20-Jul-2024 - 18-Sep-2024

Automated the collection of ambient temperature data making the process requiring zero manual labor for EPC clients as well as company Implemented Software to use this data in recommendation software to suggest suitable heating cables based on the training sessions Processed Line List documents containing around 1,000 pipes each, automating the selection of suitable heating cables for each pipe, significantly reducing manual labor and improving e**ffi**ciency Technical training regarding specifications, Heat Trace types, wiring, conditions and factors to account for.

ONT Lab,NUST

01-Jul-2025 - 25-Jan-2026

Research intern - Physical layer modelling of optical networks Worked on research related to the physical layer of optical networks. Developed OptiSystem and MATLAB co-simulations to model advanced optical communication systems. Designed and implemented a sigma-delta modulator–based system for 5G/C-RAN applications, enabling long-distance transmission between the BBU and RRH. Built custom digital filters, analyzed signal constellations, and validated results through literature review and application of established techniques. Guided junior team members while balancing independent research with collaborative discussions, fostering knowledge- sharing and effective teamwork.

Pakistan Railways

29-Jul-2024 - 10-Aug-2024

Gained exposure to large-scale production processes, learning precision techniques such as jigs and fixtures to enhance manufacturing e**ffi**ciency. Learned the challenges and requirements that need to be satisfied in working with international partners while adhering to PPRA rules Developed an understanding of the internal collaboration between various departments for smooth

production workflows, enhancing team communication and project management skills.

FINAL YEAR PROJECT

Hardware Accelerator for the Number Theoretic Transform in Kyber

The emergence of post-quantum cryptography has created a strong need for e**ffi**cient and scalable hardware implementations of lattice-based algorithms. One of the most computationally demanding components in these algorithms is the Number Theoretic Transform (NTT), which is central to the polynomial operations in CRYSTALS-Kyber. However, existing hardware designs for the NTT often face performance bottlenecks such as limited memory bandwidth, ine**ffi**cient modular reduction, and redundant computational stages. This project focuses on developing an optimized hardware architecture that addresses these challenges to achieve higher performance and improved resource utilization. Building on an existing baseline design, the work explores architectural refinements aimed at enhancing data flow, computation e**ffi**ciency, and hardware parallelism. The proposed design will be evaluated to analyze improvements in speed, area, and power consumption. The expected outcome is a high-throughput and resource-e**ffi**cient NTT architecture that contributes toward more practical and deployable post-quantum cryptographic hardware solutions

TECHNICAL EXPERTISE

Embedded Systems

Developed Semester projects in RTOS, C/C++ for real-time interaction.

Software Development

Used Python to develop programs for Korea EHT as an intern and later as an independent contractor for software development.

Digital/ASIC Design

RTL design - FYP in this area. Microarchitecture design - Designed RISCV core, verified its working using Verilator and Spike golden reference. Used Verilog, System Verilog. Used Xilinx.

AI/ML/DL

Leveraging LLM for RAG based app for Korea EHT AI/ML workflow for research on RIS-Assisted Multimodal Blockage Prediction and Proactive Beam Diversion for Reliable Hando**ff** in mmWave V2I Networks Automatic person recognition and tracking system using Yolo Email classification I use PyTorch in my ML workflo ...

Muhammad Ahmad

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PROFESSIONAL PROFILE

Motivated and creative Electrical Engineering undergraduate at NUST with a strong passion for embedded systems, AI-integrated smart technologies, machine learning, and healthcare innovations. Seeking a dynamic opportunity to apply and enhance technical and design skills, focusing on real-world problem-solving and advancing technological applications in the medical and embedded systems fields. Eager to contribute to innovative solutions while further developing expertise in AI and healthcare technologies.

EDUCATION

Bachelors in Electrical Engineering

School of Electrical Engineering and Computer Science (SEECS) - NUST University , Islamabad , 3.35 (2026)

INTERNSHIP EXPERIENCE

Xcelerium

01-Nov-2025 - 20-Jan-2026

- Contributed to the development, simulation, and system bring-up of the CVA6 RISC-V core. - Worked with Verilator, QEMU, and Vivado to simulate the core and ensure its functionality. - Assisted in designing the AXI-based memory and trace infrastructure.

NovaTechX

01-Jul-2025 - 31-Aug-2025

- Researched AI/ML solutions for the medical field. - Developed SysML-based project proposals using Cameo for healthcare projects.

NUST CSN Lab – SEECS Research Intern

01-Jun-2025 - 01-Aug-2025

Researched NFC-based medical applications and contributed to a survey paper. Developed a basic ML model with exposure to HTML/CSS.

WAPDA Engineering Academy

21-Jul-2025 - 15-Aug-2025

Explored power systems, including generation, transmission, and distribution. Gained hands-on experience through industrial visits and lab exposure.

ECOMSTARTUPS

01-Jul-2024 - 01-Aug-2024

Managed social media pages and developed engaging digital content. Created promotional material for marketing campaigns and brand growth.

CRESTEX – CrescentTextileMills–InterneeEngineer

11-Jul-2023 - 11-Aug-2023

Gained exposure to electrical engineering applications in the textile industry. Focused on integrating electrical systems within the textile manufacturing process.

FINAL YEAR PROJECT

Remote AI Driven Cardiovascular Health Monitoring System Using Wearable Biosignals

TheRemote AI-Driven CardiovascularHealth Monitoring System is a project in which we will make a wearable wristband that continuously monitors cardiovascular health using sensors for PPG, ECG, heart rate, SpO2, and blood pressure. The system employs two machine learning models: one for estimating blood pressure based on sensor signals, and the other for detecting cardiovascular diseases like arrhythmias and hypertension. Data is processed in real-time, providing users with continuous health insights and alerts via a mobile app/cloud dashboard, enabling early detection and proactive management of cardiovascular conditions.

TECHNICAL EXPERTISE

Programming Languages

Description:ProficientinC/C++,Verilog HDL, Python, and Assembly, used in various embedded systems, machine learning, and hardware design projects.

Embedded Systems & Microcontrollers

Description: Hands-onexperience withArduino, ESP32, ATMEGA32, and FPGA for designing and developing embedded systems. Worked on sensor integration, data acquisition, and real-time processing.

Simulation & Design Tools

Description:Expertise inusingtools like MATLAB, PSPICE, LTSPICE, PROTEUS, Quartus, Vivado, ModelSim, and AutoCAD for designing, simulating, and verifying electronic circuits and systems.

Machine Learning & AI

Description:Knowledge ofmachine learning algorithms and frameworks, including data preprocessing, model development, and prediction using Python libraries like scikit-learn and TensorFlow. Applied machine learning in healthcare and embedded systems projects.

Circuit Design & Analysis

Description: Skilledin designinganalog and digital circuits for various applications. Experience in using simulation tools like PSPICE and MATLAB to model and analyze circuit behaviors.

Software Development & Web Technologies

Description:Experience withwebtechnologiesincludingHTML, CSS, and basic JavaScript. Developed web-based applications for visualizing and managing embedded system data.

Faareha Sajjad

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PROFESSIONAL PROFILE

I am an Electrical Engineering undergraduate specializing in analog IC design, with hands-on experience in transistor-level circuit design and physical layout using Cadence Virtuoso. I have worked on designing, simulating, and validating CMOS analog blocks, including instrumentation amplifiers, and bring strong analytical skills supported by experience in MATLAB, Python, and AI prompt engineering.

EDUCATION

Bachelor's of Electrical Engineering

SEECS , Islamabad , 2.48 (2026)

INTERNSHIP EXPERIENCE

MiNE Lab,SEECS

23-Jun-2025 - 22-Aug-2025

- Developed transistor-level schematics in Cadence Virtuoso, performing simulations to validate circuit performance and specifications - Executed physical layouts for analog blocks, focusing on floorplanning, device placement, and routing techniques

FINAL YEAR PROJECT

Design of CMOS Instrumentation Amplifier for Spectroscopic Skin Bioimpedance Characterization

Skin impedance can o**ff**er clinically relevant information such as skin cancer and skin hydration. Four wire measurements are proposed to characterize the impedance of skin layers beneath the highly insulation, superficial stratum corneum. Skin bioimpedance system requires a voltage source to inject current into skin through the pair of force electrodes. In addition, an instrumentation amplifier is required to measure the resulting voltage across the pair of sense electrodes. A transimpedance amplifier is also required to measure the injected current. Since bioimpedance is frequency dependent, skin impedance is generally characterized over a frequency spectrum. This project aims to design and implement a high-performance analog IC for IA using Vituoso Cadence, includig both schematic design and layout for integration into skin bioimpedance measurement systems. Virtuoso Cadence is a major tool in semiconductor design, enabling efficient development of high-performance analog ICs.

TECHNICAL EXPERTISE

Analog IC Design

Strong foundation in analog IC design with solid theoretical understanding of CMOS device physics, amplifiers, current mirrors, and frequency response. Experienced in translating theory into practice by designing, simulating, and validating analog circuits using Cadence tools, including schematic capture, sim ...

Muhammad Khizer Sheraz

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PROFESSIONAL PROFILE

Engineering student with practical experience in robotics, ROS 2, and Gazebo-based simulations, along with computer vision applications using YOLO and OpenCV. Proficient in Linux and Python, with hands-on experience on embedded platforms including Raspberry Pi and Jetson Nano. Highly motivated to develop intelligent autonomous systems and deliver e**ff**ective real-world engineering solutions.

EDUCATION

Electrical Engineering

School of Electrical Engineering and Computer Science (SEECS) , Islamabad , 3.4 (2026)

INTERNSHIP EXPERIENCE

Pakistan InternationalAirlines(PIA)

29-Jul-2024 - 27-Aug-2024

• Attended workshops, seminars and talks regarding aviation safety standards, electrical workshops, avionics troubleshooting, PCAA compliance and emerging technologies. • Hands-on training and observation on flight control systems, power distribution in aircrafts, navigation systems, different parts of an aircraft and the wiring standards. • Carried out routine inspection and detailed analysis of the aircrafts with highly skilled engineers and technicians.

K-Electric (HSEQ-D)

30-Jun-2025 - 11-Aug-2025

• Conducted on-site inspections to identify hazards and verify Safety compliance of field teams. • Assisted in NEPRA visits for public accident investigations and regulatory compliance checks. • Prepared and presented quarterly performance reports to management. • Reviewed FIR/DIR reports and ensured accurate documentation of incidents.

FINAL YEAR PROJECT

LiDAR-Guided Rover for Landmine Detection

Developed a four-wheeled autonomous rover using ROS 2, implementing LiDAR-based SLAM for real-time localization and mapping and Nav2 for autonomous navigation. Integrated multiple sensors for landmine detection and validated system performance through Gazebo simulations in a Linux-based environment using Python and embedded platforms.

TECHNICAL EXPERTISE

Programming & Scripting

Python, Verilog HDL, MATLAB, C/C++

Robotics & Simulation

ROS 2, Gazebo, Nav2, LiDAR SLAM, Autonomous Navigation

Computer Vision & AI

YOLO, OpenCV, Object Detection, Sensor Fusion

CAD & Design

AutoCAD, Fusion 360

Embedded Systems & Platforms

Raspberry Pi, Jetson Nano, FPGA Development, ATmega16, ATmega32

Simulation & Tools

LabVIEW, Linux, Git, ModelSim, Quartus, Proteus, PSpice

Maleeha

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PROFESSIONAL PROFILE

Final-year Electrical Engineering undergraduate at NUST (SEECS) with strong expertise in computer vision, robotics, control systems, and AI integration. Experienced in designing and implementing complete, real-world systems that combine perception, decision-making, and actuation across software and hardware platforms.

Currently pursuing a Final Year Project focused on edge-deployed 3D vision and localization for autonomous systems, combining visual SLAM, monocular/stereo 3D perception, and human-aware navigation in resource-constrained environments.

Hands-on experience spans AI systems with LLM integration, classical and real-time computer vision pipelines, autonomous vehicle control, and embedded hardware applications.

EDUCATION

Bachelors in ELectrical Engineering

SEECS , Islamabad (2026)

INTERNSHIP EXPERIENCE

DronesNEXTlab , SEECS

01-Jul-2025 - 01-Sep-2025

In this internship , I contributed to the design and development of a bio-inspired ornithopter.We as a team developed mechanical structures and assisted in creating a non-linear controller to stabilize and regulate flight dynamics. I gained interdisciplinary exposure
to aerial robotics, control system modeling, and real-world integration of mechanical and electronic components.

FINAL YEAR PROJECT

Edge-Deployed 3D Vision & Localization for Autonomous Systems

I alongwith my team member am developing an autonomous perception system capable of real-time localization and mapping using monocular and stereo cameras, without GPS or depth sensors. The project implements visual SLAM to estimate vehicle pose, reconstruct surrounding structures, and enable collision-aware navigation, and is designed for resource-constrained edge platforms with emphasis on modularity, **effi**ciency, and scalability. It integrates human detection and perception modules for safe autonomous operation

TECHNICAL EXPERTISE

Classical Computer Vision & Augmented Reality

Implemented a markerless AR system that embeds 3D virtual objects into video scenes using Shi-Tomasi corner detection and Lucas-Kanade optical flow. Computes planar homography to track camera motion and decomposes it into rotation and translation for accurate 3D object projection. Developed an interactive int ...

AI & LLM-Driven Systems

Designed a full AI tutoring backend with NestJS and TypeScript, integrating a local LLM (Ollama) for adaptive questioning, progressive hints, and intelligent answer evaluation. Included state tracking to maintain learner progress and adapt difficulty.

Control Systems & Autonomous Vehicles

Developed adaptive cruise control using PID for real-time vehicle longitudinal dynamics. Tuned controllers for stability and

responsiveness, simulating dynamic traffic scenarios.

Autonomous Navigation & LiDAR Perception

Implemented LiDAR-based obstacle detection and virtual SLAM mapping on an autonomous vehicle. Enabled real-time navigation, trajectory planning, and collision avoidance in a physical prototype.

Embedded & IoT Systems

Designed an ESP8266-based data logger for sensor acquisition, storage, and network transmission. Built heartbeat-synchronized electronics integrating sensors.

Amna Nadeem Khan

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at NUST with a strong foundation in software development, embedded systems, and AI-driven solutions. Experienced in C/C++, Python, machine learning, computer vision, and system-level design through academic projects and internships. Proven ability to work on real-world problems involving hardware–software integration, data analysis, and automation. Highly analytical, detail-oriented, and proactive, with strong communication and project coordination skills. Eager to learn, adapt, and contribute to technology-driven teams in fast-paced, global environments.

EDUCATION

Electrical engineering

School of Electrical Engineering , Islamabad , 2.94 (2026)

INTERNSHIP EXPERIENCE

System OnChipsLabSINES,NUST

10-Jun-2024 - 01-Sep-2024

Hardware Design Engineer Implemented various digital circuits on FPGA using Verilog HDL. Projects: BCD Counter, RAM, ALU Processor, BCD to Seven Segment, Comparator Circuits etc.

FINAL YEAR PROJECT

Cardiovascular Health Monitoring System using Wearable Bio Signals through AI and ML

We are using sensors to acquire the data for ECG and PPG and using that knowledge we will extract various patient vitals such as SpO2, heartbeat, perfusion index etc. We are innovating a non invasive cuffless method of monitoring Blood Pressure and using these vitals to predict the cardiovascular disease.

TECHNICAL EXPERTISE

Web Development, Python, C++ Programming, Computer Vision

I have had a strong background in C++ programming throughout my coursework. Alongside that I am inclined towards software engineering. My final semester electives are DSA and Parallel and Distributed Programming.

Yusra Amal

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PROFESSIONAL PROFILE

I am an Electrical Engineering undergraduate at SEECS, NUST, with a strong academic foundation in electronics, embedded systems, and robotics, complemented by a growing specialization in machine learning, deep learning, and computer vision. Through carefully chosen electives and hands-on coursework, I have developed a deep interest in building intelligent systems that bridge hardware and software.

My technical experience includes an internship in drone development, where I worked on embedded and avionics systems, strengthening my skills in flight controllers, sensors, motor control, and real-time system integration. Currently, my Final Year Project focuses on designing a courier drone, integrating autonomous navigation, communication, and secure delivery mechanisms, reflecting my passion for aerial robotics and autonomous systems.

Alongside hardware, I am an active programmer with experience in C/C++, Python, Verilog, FPGA development, and mobile app integration. I enjoy solving complex engineering problems and aim to build innovative solutions at the intersection of embedded systems, robotics, and artificial intelligence.

EDUCATION

Bachelors of Electrical Engineering (BEE)

School of Electrical Engineering and Computer Science (SEECS) , Islamabad (2026)

INTERNSHIP EXPERIENCE

DroNext pvt.ltd

23-Jun-2025 - 01-Sep-2025

Assisted on drone projects, Worked with Controllers, Embedded Systems, Sensors, PID controls, App development and 3D printing.

FINAL YEAR PROJECT

PARWAAZ: Courier Drone

Developed an autonomous courier drone integrating computer vision–based human detection and OTP-authenticated parcel delivery. The system combines embedded avionics, navigation, and a servo-based dispensing mechanism for secure, intelligent last-mile delivery.

TECHNICAL EXPERTISE

Embedded systems - FPGAs | Verilog | Assembly Language | Quartus

Experienced in designing and developing embedded and real-time systems with microcontrollers (AVR, STM32, Arduino) and FPGA platforms using C/C++, Assembly, and Verilog.

AI - Machine Learning | Deep Learning | Computer Vision

Experienced in applying machine learning and deep learning for computer vision tasks such as human detection and object recognition in robotics and autonomous systems. Skilled in developing and integrating vision-based AI models with embedded platforms for real-time intelligent decision-making

Programming Languages - Python | C++ | C | Virtual Studio | Android Studio | Collab

Proficient in Python, C++, and C for developing efficient software across embedded systems, robotics, computer vision, and

automation applications. Experienced in algorithm design, firmware development, and integrating software with hardware for real-time UAV and intelligent systems.

App Development - Flutter | Dart | Android Studio

Experienced in developing cross-platform mobile applications using Flutter and Dart, with a strong focus on clean UI design, efficient state management, and seamless backend integration.

MATLAB

Proficient in MATLAB with hands-on experience from multiple lab courses, using it for simulations, data analysis, plotting, and algorithm implementation in control systems, signal processing, and embedded system applications.

UAVs - Pixhawk | ArduPilot | QGC | PID | GSM modules

Experienced in UAV systems with hands-on expertise in flight controllers, sensor integration, and PID-based attitude stabilization, including a custom bicopter flight controller project. Skilled in IMU integration, ESC motor control, and configuring ArduPilot and ground control stations.

Syed Muhammad Azeem Ul Hassan

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PROFESSIONAL PROFILE

Final year **BE Electrical Engineering** student at **NUST SEECS** with a strong passion for **Computer Networking and Artificial Intelligence/Machine Learning**. Hands-on experience building and deploying **AI/ML solutions on NVIDIA Jetson Orin Nano**, alongside practical work with **IP networks, VLANs, and OpenWRT-based routing systems**. Experienced in **Python,**

C++, and
Node.js, with exposure to **The Cloud (AWS, GCP)** and virtualized environments and Hypervisors.

EDUCATION

BE Electrical Engineering

NUST School of Electrical Engineering and Computer Science (SEECS) , Islamabad , 2.52 (2026)

INTERNSHIP EXPERIENCE

CSN Lab

01-Jun-2025 - 22-Aug-2025

AI (ML) Model for medical imaging finetuning and testing on Edge devices like Jetson Orin Nano Web Dev work in React, Node.js and PostgreSQL

FINAL YEAR PROJECT

Secure AI-Driven Healthcare System for Disease Diagnosis and Patient Management

The platform will be SehatLine which will address the critical gap in healthcare accessibility by providing a secure, AI-driven platform for disease diagnosis and patient management. Utilizing a modern software stack comprising Next.js, Node.js, and PostgreSQL, the system bridges the distance between patients and doctors through seamless appointment scheduling, remote consultations, and secure medical record storage. The platform features an integrated AI Chatbot that intelligently triages symptoms to recommend appropriate specialists, streamlining the connection process. By automating administrative workflows and o**ff**ering intuitive access to care, SehatLine aims to democratize healthcare delivery for underserved communities.

TECHNICAL EXPERTISE

Artificial Intelligence & Machine Learning

Python-based ML workflows, Medical Imaging Classification Projects, Edge AI deployment on NVIDIA Jetson Orin Nano, Proficient in Generative AI tools like ComfyUI

Computer Networking

IP networking, subnetting, routing concepts, VLAN configuration and network segmentation, Home Lab Projects with OpenWRT- based router configuration and customization, Network design and simulation using Cisco Packet Tracer, Software Defined Networks concepts and node deployment with open home solutions li ...

Cloud and Virtualization

Virtual machines and Home Lab environments with Proxmox and HyperV, Projects in AWS, Google Cloud Platform (GCP)

Single-Board Computers and Microcontrollers

Hands on Experience with NVIDIA Jetson Orin Nano, Raspberry Pi 5, NanoPi R2S, ESP32, ESP8266, Arduino Uno and Nano

Agha Mushaf Raza

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate at NUST with hands-on experience in embedded systems, industrial automation, and AI-driven solutions. Experienced in microcontroller-based IoT systems, RISC-V microarchitecture, OCR-based industrial verification, and MATLAB image processing, with practical exposure through internships in automotive manufacturing and Electrical Heat Tracing (EHT) industries. Demonstrated ability to integrate engineering fundamentals with software and machine learning techniques, complemented by strong technical writing and documentation skills through research-driven industry publications.

EDUCATION

BS Electrical Engineering

SEECS , Islamabad , 3.14 (2022)

INTERNSHIP EXPERIENCE

Atlas HondaLtd.

22-Jul-2024 - 23-Aug-2024

Developed an AI-based OCR system for engine number punching and barcode verification, gained hands-on assembly and torque check experience, and evaluated AGV motors for load capacity, cost, maintenance, and efficiency in tow trucks.

Korea EHTCo.

20-Jul-2024 - 20-Sep-2024

Participated in weekly technical coaching on Electrical Heat Tracing, gaining expertise in technologies, safety standards, and best practices. Collaborated with a software team to develop an AI algorithm for selecting efficient heating cable solutions based on client requirements.

Railway Workshops

18-Aug-2025 - 01-Sep-2025

Analyzed the manufacturing, maintenance, and testing processes across seven operational sections of the Railway Powerhouse, Carriage, and Locomotive workshops, gaining practical exposure to large-scale electrical systems and railway infrastructure.

Novatechx

01-Jul-2025 - 31-Aug-2025

Worked on the AI-Enhanced Peripheral Vein Finder project, applying AI for vein detection, contributing to planning and RFPs, and gaining hands-on experience with emerging technologies.

FINAL YEAR PROJECT

Embedded Design for Real-Time Nanometric Vibration Sensing

Designing a compact FPGA-based system for real-time nanometric vibration sensing using SC-TFSP, offering a high-speed, low-latency, and cost-effective solution for precise motion monitoring in aerospace, automotive, and biomedical applications.

TECHNICAL EXPERTISE

Programming Languages

C, C++, Python, MATLAB, RISC-V Assembly, Verilog, VHDL

Platforms and Framework
ESP32,STM32,Arduino,RaspberryPi, TensorFlow, PyTorch, FPGA Development

Software and Tools
VivadoHLS,IntelQuartus,MATLAB-Simulink, Ansys, AutoCAD, MS Office, LabView, Pspice, Atmel Studio, Proteus, Vs Code.

Industry Specific Expertise
IndustrialAutomation,ElectricalHeat Tracing Systems.

Muhammad Uzair Wajeeh

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at NUST SEECS with a growing interest in computer and communication networks. Completed an internship at CSN Lab, NUST, and currently undertaking an engineering internship at Transworld, gaining initial exposure to optical fiber communication networks and network planning concepts. Possess foundational understanding of networking principles and system-level engineering workflows. Currently pursuing a Final Year Project related to secure AI-driven healthcare systems and motivated to further develop practical networking and communication engineering skills.

EDUCATION

Bachelors in Electrical Engineering (BEE)

School of Electrical Engineering and Computer Science(SEECS) , Islamabad , 2.25 (2022-2026)

INTERNSHIP EXPERIENCE

Summer InternatCSNlab(NUST)

25-Jun-2025 - 25-Aug-2025

Learned and applied LaTeXand Overleaf for professionalacademic witing, collaborative editing, and paper formatting. Gained hands- on skills in cross-platform appdevelopment using React Native for building mobile applications. Learned to use Postman for testingand validating RESTful APIs

Transworld Home

08-Jan-2026 - 09-Feb-2026

Engineering Intern - OFC Planning and Development

FINAL YEAR PROJECT

Secure AI-Driven Healthcare System for Disease Diagnosis and Patient Management

Artificial intelligence (AI) and machine learning (ML) are transforming healthcare by enhancing disease diagnosis, hospital workflow, and patient management. Traditional diagnostic methods for diseases like malaria, pneumonia, and other infections often suffer from human error, delays, and accessibility issues, particularly in remote and resource-limited regions. There is a growing need for an AI-powered healthcare management and disease diagnosis platform that can support automated medical analysis and patient-doctor connectivity. However, AI-driven healthcare systems also introduce security and privacy concerns, as unauthorized access, data tampering, and lack of accountability can result in serious privacy breaches, misdiagnoses, and regulatory violations. Without strict access control, any staff member, whether a doctor, nurse, or technician, could view or alter sensitive medical data, increasing the risks of errors, fraudulent activity, and loss of patient trust. Given the sensitive nature of medical records and personal health information, it is critical to implement advanced security measures to protect patient data from cyber threats and unauthorized access. This FYDP aims to develop a Secure AI-Driven healthcare Management and Disease Diagnosis System that integrates AI-powered disease detection, patient-doctor connectivity, and hospital workflow automation while ensuring robust security mechanisms to safeguard sensitive medical data. The system will enhance early disease detection and medical decision-making by utilizing deep learning models for medical imaging analysis and Large Language Models (LLMs) for real-time patient guidance. Beyond diagnosis, the system will support secure patient data management, appointment scheduling, resource tracking, and emergency alerts. In critical cases, it will automatically connect patients to the nearest available doctor and facilitate appointment booking. To address security concerns, the system will incorporate Role-Based Access Control (RBAC) to restrict access based on user roles, ensuring that only authorized personnel can view or modify specific patient records. RBAC enhances data security by preventing unauthorized access, improving accountability, and maintaining a detailed audit trail of all system activities. Additionally, Multi-Factor Authentication (MFA) will strengthen login security, End-to-End Encryption will secure data transmission, and Blockchain Audit Logs will provide an

immutable record of all transactions to prevent data tampering. By integrating these advanced security mechanisms, the Secure AI-Driven Healthcare Management and Disease Diagnosis System will ensure that medical data remains confidential, accurate, and accessible only to authorized users, reinforcing healthcare cybersecurity, minimizing data breaches, and maintaining the integrity of patient information.

TECHNICAL EXPERTISE

Technical Skills

Have basic academic exposure to electrical engineering concepts related to communication and networking through coursework and internships. Familiar with introductory use of common engineering and academic tools such as MATLAB, Proteus, PSpice, Arduino, Postman, and LaTeX/Overleaf for simulations, documentati ...

Muhammad Abubakar Farooq

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PROFESSIONAL PROFILE

Neutral academic record graduate with a foundation in **machine learning, statistical modeling,** and **algorithm design**, complemented by hands-on experience in applied AI and system-level projects. Proficient in modern machine learning frameworks,

with practical exposure to **data preparation, modeling, evaluation,** and **deployment**.

EDUCATION

BE Electrical

SEECS , Islamabad , 2.78 (2022)

INTERNSHIP EXPERIENCE

PCSIR LaboratoriesComplex

26-Jun-2023 - 29-Jul-2022

Completed a 4-week hands-on internship in the design and optimization of precision laboratory equipment, including laboratory ovens and thermostatic dry baths. Gained practical experience with temperature sensing, microcontroller-based PID control, and thermal regulation systems. Worked with relays, MOSFET drivers, signal conditioning circuits, and user-interface modules. Performed PCB-level testing and diagnostics, demonstrating strong understanding of embedded closed-loop systems.

FINAL YEAR PROJECT

Olive Yield Prediction using Computer Vision and Edge computing

An AI-based system for automated olive yield estimation using computer vision and deep learning. The project employs a lightweight U-Net image segmentation model trained on a custom, manually annotated dataset to accurately detect olives under natural orchard conditions. Model performance was evaluated using Dice Score and mAP metrics, demonstrating improved robustness over traditional object detection approaches in complex scenes. The optimized model was deployed on an NVIDIA Jetson Nano for real- time inference from a live camera feed, enabling low-latency, edge-based agricultural monitoring.

TECHNICAL EXPERTISE

Syed Shaheer Raza Naqvi

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate at NUST with a multidisciplinary skill set spanning embedded systems, digital design, and machine learning. Experienced in developing real-time computer vision applications, including a sign language recognition system using LSTM models and MediaPipe. Strong background in C++/Python, hardware-software integration, and engineering simulation tools, complemented by industrial exposure at Pakistan Airports Authority (CNS).

EDUCATION

BE Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 2.57 (2026)

INTERNSHIP EXPERIENCE

Pakistan AirportsAuthority

03-Jul-2025 - 17-Aug-2025

I completed a six-week internship at the Communication, Navigation, and Surveillance (CNS) Department of Pakistan Airports Authority (PAA) at Multan International Airport. During this internship, I gained hands-on exposure to the operation, monitoring, and basic maintenance of critical aviation CNS systems, including air-ground communication systems, navigation aids, surveillance and monitoring equipment, and supporting IT and power infrastructure. I also developed an understanding of system redundancy, fault monitoring, regulatory compliance, and the role of CNS systems in ensuring safe, reliable, and efficient air traffic management.

FINAL YEAR PROJECT

SignLink: Bridging Communication Through Vision and AI

Developed a real-time sign language recognition system using a React Native mobile app and a Flask-based server. MediaPipe for feature extraction and trained an LSTM model on custom gesture dataset for gesture-to-text conversion. Integrated

TECHNICAL EXPERTISE

Expertises in Embedded Systems, Machine Learning and Computer Vision

I possess strong technical expertise in electrical testing, troubleshooting, and circuit design, with hands-on experience in embedded systems development. I am proficient in C++ and Python programming and have extensive experience working with microcontrollers and FPGAs, including hardware description using V ...

Ameen Ahmed

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PROFESSIONAL PROFILE

I am currently working as a Research Assistant in CARE Pvt. My responsibilities include designing architecture for RISC ISAs. I have also worked with Embedded Linux on the Intel DE1-SoC Board.

EDUCATION

Bachelor of Electrical Engineering
SEECS , Islamabad , 3.75 (2028)

Bachelor of Electrical Engineering
SEECS , Islamabad , 3.75 (2028)

INTERNSHIP EXPERIENCE

SEECS E SDACLab

17-Jun-2024 - 30-Aug-2024

Worked with Embedded Linux on the DE1-SoC Board under the supervision of Dr. Usman Zabit. Mainly worked on using the PS to program and use peripherals and device drivers.

FINAL YEAR PROJECT

Ultra Low Power RISCV

This project presents the design and implementation of a Low Power RISC-V processor that leverages three key power optimization techniques: clock gating, power gating, and Dynamic Voltage and Frequency Scaling (DVFS). The RISC-V instruction set architecture (ISA) was chosen for its open-source nature, modularity, and suitability for research-driven customization.

TECHNICAL EXPERTISE

C/C++

Proficient

Digital System Design

Skilled in Vivado.

Linux

Experience with Ubuntu

Fateha Kamran

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PROFESSIONAL PROFILE

I am an Electrical Engineering student currently in my eighth semester, with a strong foundation in programming, embedded systems, and electronics. I combine analytical thinking with creativity to develop solutions that are both practical and innovative, with a focus on automation, IoT, and computer vision. I am self-reliant, possess strong critical thinking and communication skills, and excel in time management and collaborative projects. Adaptable and driven, I am eager to gain hands-on experience to deepen my understanding of real-world engineering applications and emerging technologies.

EDUCATION

Electrical Engineering

SEECS , Islamabad , 3.59 (2026)

INTERNSHIP EXPERIENCE

Pakistan RailwayCarriageFactory

26-Aug-2024 - 07-Sep-2024

Gained exposure to power shop and TL shop. Observed quality control procedures and industrial safety practices within a large-scale manufacturing environment.

Pakistan RedCrescentSociety:

02-Aug-2024 - 16-Aug-2024

Contributed to community outreach programs focused on health awareness and promoting humanitarian values in local communities.

DroNext Pvt.Ltd.GraduateResearchComplex,SEECSNUST:

01-Jun-2025 - 11-Jul-2025

Implemented the computer vision module of a vision-guided drone using YOLO-based object detection for autonomous tracking.

Heavy IndustriesTaxila:

14-Jul-2025 - 22-Aug-2025

Gained exposure to advanced defense manufacturing processes and engineering practices.

FINAL YEAR PROJECT

TAAK: Vision-Guided Laser Tracking System for Autonomous Drone Missions

This project proposes the development of an innovative autonomous drone-based tracking system capable of precisely following user-designated objects from a predefined distance. The system integrates a sophisticated image processing pipeline for robust object detection and identification, coupled with a novel 2D laser tracking module. The inherent limitations of a 2D laser system for full 3D tracking are ingeniously overcome by leveraging the drone's yaw movement to compensate for the third axis, e**ff**ectively creating a pseudo-3D tracking capability. The drone will employ advanced navigation algorithms to maintain a constant stando**ff** distance from the target while continuously adjusting its position and orientation to keep the laser focused. Users will have the flexibility to assign the target object, allowing for diverse applications ranging from surveillance and monitoring to automated inspection and dynamic object pursuit. This system aims to o**ff**er a cost-e**ff**ective, highly maneuverable, and versatile solution for autonomous object tracking, significantly enhancing capabilities in scenarios requiring precise and sustained aerial observation. Future work will focus on optimizing real-time processing, improving tracking robustness in challenging environments, and exploring potential applications in various industrial and security contexts

TECHNICAL EXPERTISE

Programming

C/C++,Python,Verilog, Assembly

Embedded Systems & Microcontrollers:
STM32, ATmega, ESP32; IoT & real-time control

Computer Vision & AI
OpenCV,YOLOv8,objectdetection & tracking, gesture recognition

Simulation & Circuit Design
MATLAB,Simulink,Proteus,PSPICE,Multisim, Quartus

Hardware & Electronics:
Circuitdesign,analog/digitalelectronics, sensors

Software & Design Tools:
LabVIEW,ArduinoIDE,AutoCAD,Blynk, Adobe Photoshop, Canva

Software & Design Tools:
LabVIEW,ArduinoIDE,AutoCAD,Blynk, Adobe Photoshop, Canva

Project Management & Communication:
Technical documentation, teamwork, leadership, presentations

Ali Ahsan

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PROFESSIONAL PROFILE

Passionate Electrical Engineer with a strong foundation in hardware design, embedded systems, and combined with growing expertise in Artificial Intelligence, Machine Learning, Deep Learning, and Computer Vision. Highly motivated to apply interdisciplinary skills in Verilog, embedded programming, and data-driven algorithms to design intelligent, e**ffi**cient, and scalable engineering systems. Seeking opportunities to bridge hardware and AI-driven solutions while contributing to innovation in next-generation electronic and intelligent technologies.

EDUCATION

BEE (Bachelor of Electrical Engineering)

SEECS (School of Electrical Engineering and Computer Science) , Islamabad , 3.50 (4)

INTERNSHIP EXPERIENCE

Xcelerium

03-Nov-2025 - 19-Jan-2026

Project Title: Custom RISC-V Embedded Linux Distribution Role: Systems Engineer / Embedded Software Developer Description: Built a minimal Linux OS from source using Buildroot targeting RISC-V 64-bit architecture. Configured and optimized Linux Kernel v6.x, stripping unnecessary subsystems to reduce boot time and memory footprint. Developed a custom root filesystem integrating BusyBox and user-space applications. Emulated and tested the OS image with QEMU, validating boot flows and hardware interfaces. Key Skills: Linux Kernel configuration, Buildroot, RISC-V, BusyBox, QEMU, embedded OS optimization.

SEECS

10-Jun-2025 - 26-Aug-2025

Project Title: Design of Drone Control System using Reinforcement Learning Role: Embedded Engineer & Model Trainer Description: Developed a reinforcement learning–based drone control system by training high-fidelity 6-DoF quadrotor models in Unity ML-Agents. Deployed the learned control policy on an Arduino Mega controller, enabling real-world flight execution. Implemented Wi-Fi–based short-range communication and integrated onboard sensors: IMU (gyroscope) for attitude stabilization and barometric sensor for altitude estimation. Optimized reward functions and control parameters to achieve stable take-o**ff**, hovering, and landing. Evaluated system performance against classical nonlinear control methods, demonstrating improved robustness and adaptability to disturbances. Key Skills: Reinforcement learning, Unity ML-Agents, embedded control, Arduino integration, sensor fusion, control system optimization, 6-DoF drone modeling.

FINAL YEAR PROJECT

Baymax: Your Personal Health Companion

Role: Embedded Systems & AI Developer Description: Designed and developed a personal health monitoring robot capable of analyzing patient health using LLMs and custom-trained models deployed on-edge with Jetson Orin Nano. Implemented rPPG-based heart rate detection via camera and analyzed voice-based health data via microphone for disease-related signals. Integrated temperature sensor for body temperature monitoring and touchscreen display on the torso for interactive user interface. Integrated camera and speaker interfaces for real-time interaction, speech communication, and friendly UX. Packaged the system inside a 3D- printed humanoid robot body for user-friendly design. Enabled automatic health report generation and anomaly alerts, sending notifications to doctors via email for critical conditions. Optimized edge deployment of AI/LLM models, ensuring real-time performance without relying on cloud computing. Key Skills: Embedded AI, Edge Computing, rPPG, LLMs, Jetson Orin Nano, sensor fusion, computer vision, speech processing, temperature sensing, 3D-printing, healthcare applications.

TECHNICAL EXPERTISE

Embedded Systems & Firmware:

Linux Kernelcustomization,Buildroot,RISC-V embedded OS, driver development, firmware debugging, sensor integration, host-side trace analysis, Arduino, Jetson Orin Nano.

AI / ML / DL / Computer Vision:

Practical Experience:Edge AIdeployment on embedded devices (Jetson Orin Nano), rPPG-based health monitoring, reinforcement learning for drone control, computer vision, speech/audio analysis, LLM integration. Model Development & Techniques: Model creation, feature extraction, CNNs, reinforcement learning, ...

Digital Design & Chip Design:

RTLdesign,FPGA/ASICdevelopment,Verilog & SystemVerilog, 5-stage RISC-V processor implementation, logic synthesis, timing analysis, digital circuit design.

Programming & Software:

Python,C++,MATLAB,Verilog/SystemVerilog, AutoCAD, Fusion 360, ANSYS Motor-CAD.

Simulation & Modeling Tools

UnityML-Agents,MATLAB/Simulink,Proteus, PSPICE, NI LabVIEW, ROS, Gazebo.

Muhammad Dawood Arslan

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PROFESSIONAL PROFILE

A fledgling Electrical engineer with an interest in chip design and 3D printing/modeling.Most of my professional experience leans towards chip deign and hardware oriented roles, however i have plenty of experience with software based projects as well.

EDUCATION

BEE

SEECS , islamabad , 2.6 (2026)

INTERNSHIP EXPERIENCE

Nust ChipDesignCenter(NCDC)

18-Feb-2025 - 22-May-2026

Completed a 6-month training period during which concepts such as C programming, Digital logic design and Computer Architecture were covered. Some of the highlight projects were the Huffman encoder/decoder made using C and the 5-stage pipelined RISC-V processor. Exams and evaluations were held at the end of each module. Currently working on my FYP under them.

ESDAC Lab(Seecs)

17-Jun-2024 - 30-Aug-2024

Remotely worked on understanding a non-uniform laser measuring algorithm and then worked on porting it from Matlab to C for real time applications. Also worked with the DE1-SOC to understand how to use and implement embedded Linux on it.

Code for Pakistan (paid volunteer)

01-Oct-2024 - 01-Jan-2025

Consulted regarding hardware implementation of an electronic voting machine (EVM). Aided in recommending and interfacing required hardware with the EVM, a raspberry pi 4 was used.

FINAL YEAR PROJECT

ASIC design of AES Rijndael

implementing AES- 128 with support for 128,192 and 256 bit keys. This project will support an AXI4-Lite and Avalon interface. The project will encompass the entire chip design pipeline from RTL -> UVM -> GDSII.

TECHNICAL EXPERTISE

Verilog/System verilog

-Designed a 5-stage pipelined RISC-V processor -Designed SPI support for the RISC-V processor -Implemented and designed an AES 128/192/256 processor -implemented and designed an AXI4 Lite slave interface for the AES processor -various minor projects involving Verilog/system Verilog for semester labs/proje ...

3D modeling/printing

-debugging and assembling my personal Creality Ender 3 Pro 3D printer. -Experience with AutoCAD and FreeCAD. -Experience with Cura. -Designed and printed a hand prosthetic prototype from scratch

Arduino/ESP32/ATmega16A

-Used FreeRTOS on an ESP32 in order to better understand RTOS concepts. -implemented a basic noise display system using a dot matrix display and a mic. -worked with ESP32CAM for use in image processing. -created a soil health monitoring system using a temperature and humidity sensory by burning code onto a ...

C/C++/Python

-implemented a Hu**ff**man encoder/decoder in C. -gesture recognition system in order to control laptops volume implemented in C/C++ and python to compare di**ffi**culty. -created a game using raylib in C. -Partially created my own library to run MATLAB functions such as cubic spline interpolation. -minor project ...

Matlab

-Understood and documented a proprietary algorithm for non-uniform laser measurements. -implemented basic image processing techniques to better understand the e**ff**ect on a pixel-to-pixel basis. -implemented an algorithm for FM and AM modulation of a signal. -minor projects pertaining to labs and basic concepts ...

DE1-SOC (fpga)

Experience with debugging and maintaining my own personal DE1-SOC which has been used in both simulating Digital logic and using embedded linux on it.

Ali Taimoor Khalid

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PROFESSIONAL PROFILE

Final Year Electrical Engineering student skilled in digital & embedded systems, PCB design, and machine learning fundamentals. Experienced in hardware/software integration, system-level problem solving, CAD/CAM, and CNC machining with Autodesk Powershape & Powermill, plus basic reverse engineering using 3D scanning. Open to entry-level roles in embedded systems, machine learning, mechatronics, automation, or applied engineering.

EDUCATION

Electrical Engineering

School of Electrical Engineering and Computer Science (SEECS) , Islamabad , 2.6 (4)

INTERNSHIP EXPERIENCE

Pioneer PowerGeneration(Rawalpindi)

01-Jun-2025 - 31-Jul-2025

Electrical work of different sites of Pakistan Tobacco Company (PTC) Field work on Cummins KTA 50 generators for Oil and Gas Development Company Limited (OGDCL)

FINAL YEAR PROJECT

Digital Twin Of UAV

A Digital Twin of a UAV is a real time virtual replica of a drone with bidirectional control. Data from live flights is used to update the virtual model in real time and optimized control decisions can be given to the physical UAV using the virtual twin. The system enables real time monitoring, performance optimization, and intelligent UAV operations.

TECHNICAL EXPERTISE

Digital and Embedded System Design

Digital System Design (Combinational and sequential logic) Embedded System Design

Electronics and Design

PCB design (Schematic and layout) Analog and digital electronics fundamentals Power electronics basics

Machine Learning

Machine learning fundamentals. Supervised and unsupervised learning basics. Feature extraction and data preprocessing. Model evaluation and validation concepts.

Computation and Analysis

MATLAB for simulation, analysis and modelling. Signal processing basics. Algorithmic problem solving.

Core Electrical Engineering

Signals and Systems. Linear Control System. System modelling and analysis. Feedback and stability concepts.

Additional Skills

Autodesk PowerShape (3D modeling and part design). Autodesk PowerMill (toolpath generation and optimization). CNC Machining

(3-Axis and 4-Axis). Reverse engineering using 3D scanners (point cloud to CAD). Design for Manufacturability (DFM).

Fatima Tariq

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PROFESSIONAL PROFILE

Objective:

Motivated Electrical Engineering undergraduate with strong expertise in computer architecture, VLSI design, embedded systems, and AI hardware acceleration, seeking industry roles to develop high-performance, energy-efficient in-memory computing and machine learning hardware solutions.

Professional Summary:

Detail-oriented Electrical Engineering student with hands-on experience in in-memory computing (IMC) architectures and AI accelerators, including RTL design and preparation for chip tape-out. Strong understanding of transformers, memory hierarchies (SRAM/DRAM), and hardware–software co-design for machine learning workloads. Proven ability to analyze research papers, translate theory into microarchitectural insights, and communicate complex technical concepts clearly in presentations and reports. Actively engaged in academic research projects and innovation-driven competitions, with a strong interest in energy-efficient and scalable computing systems.

EDUCATION

EE

SEECS , Faisalabad , 3.55 (2022)

INTERNSHIP EXPERIENCE

SoC Lab

18-Jun-2025 - 22-Aug-2026

During my internship at the SOC Lab under the supervision of Professor Iman, I was assigned tasks focused on strengthening my foundation in Computer Architecture, gaining hands-on experience with Cadence EDA tools through lab sessions, and developing an understanding of the RTL-to-GDSII design flow. This journey enhanced both my theoretical knowledge and practical skills in VLSI design, while also giving me exposure to industry-standard tools and methodologies.

FINAL YEAR PROJECT

Impact-SoC

The rapid growth of AI and data-intensive applications exposes the memory wall of von Neumann architectures, where excessive data movement between compute and memory degrades performance and energy efficiency. In-Memory Computing (IMC) addresses this limitation by performing arithmetic directly within memory arrays. Building upon a prior SRAM-based In-Memory Computing Unit (IMCU) integrated with a RISC-V SoC, the IMPACT SoC advances this work through architectural optimization, thorough RTL verification, and chip-ready physical design. The proposed system integrates an enhanced in-memory vector processing engine with a RISC-V core, an optimized DMA subsystem, and improved accumulation structures to achieve higher throughput, lower latency, and efficient parallel computation. The final outcome is a synthesizable, verified, and physically realizable in-memory accelerator, demonstrating the potential of IMC for energy-efficient AI and edge computing applications.

TECHNICAL EXPERTISE

Computer Architecture

RISC-V pipeline design, processor datapath & control, memory hierarchy fundamentals

VLSI Design & CAD Tools
RTL-to-GDSIIflow,hands-onexperience with Cadence EDA tools

Programming & Simulation
Coding(HDL / general-purpose),MATLAB for analysis and modeling

Hira Zahid

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PROFESSIONAL PROFILE

Electrical Engineering student at **NUST SEECS** with strong interest in power systems, smart grids, and embedded systems. Hands- on experience in electrical laboratories through an internship at **Fauji Foundation University**, where I developed practical skills in circuit design, assembly, testing, and debugging. Currently working on a Final Year Project focused on **smart energy metering and intelligent load management** using embedded systems and real-time monitoring. Motivated to apply theoretical knowledge to real- world electrical and energy management problems.

EDUCATION

EE

SEECS , Islamabad , 2.61 (2026)

INTERNSHIP EXPERIENCE

Foundation UniversityofIslamabad

01-Jul-2024 - 15-Aug-2024

Engaged in advanced electronic equipment, enhanced competence in electronic system design and technical troubleshooting. I have demonstrated marked abilities in technical execution, analytical reasoning, collaborative work, e**ff**ective communication and application of engineering knowledge.

FINAL YEAR PROJECT

Smart Energy Meter with Intelligent Load Management and Adaptive Tariff Control

This Final Year Project focuses on the design and implementation of a smart energy meter integrated with an intelligent load management system to improve power utilization and reduce the impact of load shedding. The system enables real-time monitoring of electrical loads using current and voltage sensors, with measured data processed by an ESP32 microcontroller for intelligent decision-making. Adaptive cost functions are dynamically updated based on grid conditions and utility-defined power supply priorities to promote automated partial load shedding instead of complete shutdowns. Loads are managed according to an optimal priority sequence and consumer-selected tari**ff** plans, ensuring that critical loads remain operational during power shortages. The proposed solution supports demand-side management without relying on costly and ine**ffi**cient battery storage systems. A mobile application/dashboard is also incorporated to allow real-time monitoring and control of connected loads, with optional integration of local renewable energy sources. Overall, the project aims to enhance energy e**ffi**ciency, prevent complete blackouts, and contribute toward the development of smarter and more resilient power distribution systems.

TECHNICAL EXPERTISE

Technical Expertise in Electrical Engineering & Smart Energy Systems

Electrical circuit design, assembly, testing, and debugging Electrical measurements using multimeters, oscilloscopes, and power supplies Smart energy metering and real-time power monitoring Intelligent and priority-based load management techniques Embedded systems development using ESP32 microcontroller ...

Muddassir Sadiq

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PROFESSIONAL PROFILE

Keen to learn and grow as a wireless communications researcher with strong expertise in deep learning–enabled next-generation networks, including 6G, ISAC, CR-NOMA, MIMO, and intelligent reflecting surfaces. Experienced in applying deep reinforcement learning to resource management, scheduling, and security-aware optimization, with hands-on research contributions published in leading IEEE journals. Demonstrated ability to conduct analytical modeling, simulations, and system-level performance evaluation for IoT, HAPS, and RIS-assisted networks. Motivated to contribute to cutting-edge research and collaborative teams addressing latency, security, and efficiency challenges in future wireless communication systems.

EDUCATION

BE Electrical Engineering

School of Electrical Engineering and Computer Science , 3.7 (2026)

INTERNSHIP EXPERIENCE

Information Processing and Transmission (IPT) Lab

01-Mar-2025 - 23-Jan-2026

Conducting research on next-generation wireless network architectures through analytical modeling and simulations. Actively exploring deep reinforcement learning techniques for AI-native network optimization, with multiple works submitted to top-tier wireless communication journals.

Adept TechSolutions

30-Apr-2025 - 31-Jul-2025

Developed and evaluated AI-driven solutions for wireless communication applications. Applied machine learning models to optimize system performance and collaborated with multidisciplinary teams to integrate AI modules into practical communication workflows.

Water andPowerDevelopmentAuthority(WAPDA)

01-Jul-2023 - 31-Aug-2023

Gained hands-on exposure to power generation, transmission systems, and national grid operations. Assisted in testing electrical equipment and observed grid stability and safety practices.

FINAL YEAR PROJECT

Age-Aware Deep Reinforcement Learning for Resource Allocation in 6G- Enabled IoT networks

The emergence of 6G networks is expected to revolutionize the Internet of Things (IoT) landscape by enabling ultra-reliable, low-latency, and intelligent connectivity for massive device deployments. As real-time IoT applications—such as industrial automation, autonomous systems, and remote monitoring—demand timely and energy-**effi**cient data delivery, conventional resource allocation strategies fall short in meeting the stringent performance requirements. In this work, we propose an intelligent, age-aware scheduling framework powered by deep reinforcement learning (DRL) to enhance the freshness of information and optimize resource allocation
in 6G- enabled IoT networks. Our approach integrates key enablers such as cognitive radio and non-orthogonal multiple access (CR- NOMA), along with realistic considerations like energy harvesting, queue dynamics, and interference constraints. By leveraging advanced DRL algorithms, we demonstrate significant improvements in system performance with respect to Age of Information (AoI), energy sustainability, and throughput. This research highlights the potential of AI-driven decision-making to unlock scalable, context- aware communication in future-generation IoT infrastructures.

TECHNICAL EXPERTISE

Technical Skills

Languages: Python, C/C++, Java, MATLAB, HTML/CSS, Assembly APIs and Libraries: Pandas, Numpy, Scikit-learn, Pytorch, Tensorflow, OpenCV Developer Tools: Git, Jupyter notebook, VS Code, Cursor

Soft Skills

Analytical Thinking & Problem Solving Time Management & Organization Interpersonal Communication & Team Collaboration Emotional Intelligence Adaptability & Cognitive Flexibility

Noor Fatima Masud

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PROFESSIONAL PROFILE

A final year Electrical Engineering student from SEECS, NUST. With interest in signal processing, embedded systems and ML&AI and necessary technical skills in these fields, I would like to broaden my area of expertise even more by working in the industry in any of these fields.

EDUCATION

Bachelors in Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 2.84 (2026)

INTERNSHIP EXPERIENCE

MachVis Lab,NUST

01-Jun-2024 - 31-Aug-2024

Project about detecting driver drowsiness in remote and far-flung areas using ML and DL as well as transfer learning techniques in a research lab.

Nokia

07-Jul-2025 - 15-Aug-2025

Internship in telecom industry. Learnt about basic networking and telecom concepts. Introduction to GSM,LTE,2G,3G,4G etc. Concepts like cloud and RAN as well

FINAL YEAR PROJECT

Displacement Sensing using a Laser Feedback Sensor

The original work that we continue demonstrated a displacement sensor using laser self-mixing (optical feedback interferometry, OFI) treated as a non- uniform event-based sampling (NUS) system, achieving sub-lambda/2 resolution for moderate feedback(C>1).

TECHNICAL EXPERTISE

Experience with MATLAB,C++,Python, FPGA, STM devices as well as microprocessors, electronic devices and ROS.

Over the course of my degree I have worked with multiple devices in different sub fields and streams and I have a good beginner's technical knowledge in different programming languages, as well as hardware and electronic devices.

Muhammad Abdullah

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PROFESSIONAL PROFILE

I am a Full Stack Developer with hands-on experience in building end-to-end web applications and a strong foundation in modern frontend and backend technologies. I am currently learning AI/ML with a clear goal of specializing in Generative AI application development. I have initial experience working with GenAI during my final year project, where I integrated AI-driven features into a full-stack system. I am actively expanding my expertise to become proficient in designing, developing, and deploying intelligent, scalable AI-powered applications.

EDUCATION

BE Electrical Engineering

SEECS , Islamabad , 2.57 (2026)

INTERNSHIP EXPERIENCE

Inlights

01-Jan-2026 - 30-Jun-2026

I completed my internship as a Web Development Intern at Inlights Solutions, where I worked on designing and developing responsive web interfaces using HTML, CSS, JavaScript, and React. I contributed to backend development using Node.js and Next.js, performed API integrations for dynamic applications, and worked with PostgreSQL and MongoDB for data management using Prisma ORM. During my internship, I also explored and applied Generative AI concepts in practical projects while collaborating closely with the development team, demonstrating strong problem-solving skills, professionalism, and a proactive approach to learning.

FINAL YEAR PROJECT

AI based social media assistant for content generation and automated publishing

This project focuses on developing an AI-powered social media assistant that automates the entire content creation and publishing workflow. The system allows users to generate platform-specific social media posts, including captions, hashtags, and AI-generated images, through simple natural language inputs. It integrates Generative AI models for content and image generation, provides a user dashboard for post management, and enables automated scheduling and publishing using official social media APIs. The project is built using a full-stack architecture with Next.js, PostgreSQL, secure authentication, and backend automation, aiming to save time, improve consistency, and simplify social media management for individuals and businesses.

TECHNICAL EXPERTISE

I have following technical expertise

Frontend Development: HTML, CSS, JavaScript, React.js, Next.js (App Router), Tailwind CSS, Responsive UI Design Backend Development: Node.js, Next.js API Routes, RESTful APIs, Server-side Rendering, Authentication & Authorization Databases & ORM: PostgreSQL, MongoDB, Prisma ORM, Database Modeling, Re ...

Afnan Khan

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PROFESSIONAL PROFILE

Motivated electrical and computer engineering graduate with strong hands-on experience in embedded systems, IoT-based smart energy metering, and power system monitoring. Proficient in designing and implementing ESP32-based solutions integrating voltage and current sensing, power factor analysis, energy billing, and MQTT-based communication for real-time grid and load management. Experienced in applying data-driven and machine learning concepts to power demand analysis and peak-hour prediction for smart grid readiness. Demonstrates solid problem-solving skills, practical hardware–software integration expertise, and a strong interest in intelligent energy systems, automation, and scalable industrial solutions. Seeking opportunities to contribute to innovative engineering projects in energy or smart infrastructure domains.

EDUCATION

EE
SEECS , Islamabad , 3.3 (2026)

INTERNSHIP EXPERIENCE

Pakistan OrdnanceFactories(POF)
30-Jun-2025 - 23-Aug-2025

Completed a technical internship at Pakistan Ordnance Factories, gaining practical exposure to industrial electrical and electronic systems. Assisted in understanding power distribution, control systems, and instrumentation used in large-scale manufacturing environments. Observed preventive maintenance practices, safety standards, and quality control procedures, and developed insight into real-world engineering workflows, documentation, and compliance within a defense-grade industrial setup.

FINAL YEAR PROJECT

Smart Load Management for Optimally Improved Power Economy

This project targeted to implement a smart energy meter incorporating smart load management system. Implementation includes design of adaptive cost functions from utility to encourage automated partial load shedding instead of full load shedding. The project focuses on developing a smart energy meter capable of real-time monitoring of consumer loads. Using current and voltage sensors, the system measures power consumption and communicates the data to a microcontroller (ESP32) for intelligent decision-making. Based on grid conditions to update cost functions in real time based on power supply priority routines, the smart meter will automatically adjust loads with optimal priority order as well as by selected tari**ff** plan by consumer thereby keeping critical loads active. This ensures e**ffi**cient utilization of available power, prevents complete blackouts, and supports demand-side management without relying of expensive and ine**ffi**cient battery storage systems. The system also features a mobile application/dashboard for real-time monitoring and control of loads with or without local renewable energy generation.

TECHNICAL EXPERTISE

System Design & Engineering Skills

Hardware–software integration Modular firmware design and testing Problem analysis, debugging, and optimization

Muhammad Ishaq

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PROFESSIONAL PROFILE

Full-Stack MERN and Next.js Developer with 2.5+ years of professional experience in designing, developing, and maintaining
large-scale, mission-critical web applications. Played a key role in the development of the **DIRECT Portal (Development, Innovation, and Research for Evolving Cutting-edge Technologies)**, a national-level platform supporting research and innovation initiatives. Worked with the **Ministry of Science and Technology, Government of Pakistan (irada.pk)**,

contributing tosecure and
scalable digital solutio ns.
international logistics management system, focusing on performance, reliability, and user-centric design.

Alongside full-stack development, experienced in **data analytics and machine learning**, including working with **ICON NUST** on data analysis projects. Completed multiple **machine learning and computer vision projects** as part of elective coursework, applying industry-standard tools and modern technologies. A highly motivated and enthusiastic professional with a strong commitment to continuous learning, teamwork, and delivering impactful solutions.
Additionally, worked **remotely with a Canadian logistics company, Maple Logistics Trading**, on the development of an

EDUCATION

BEE

School of electrical engineering and computer science , Islamabad , 2.33 (2026)

INTERNSHIP EXPERIENCE

Logixsy

15-Jun-2023 - 28-Jul-2023

Logixsy is a software company located in I-10, Islamabad, where I worked as a Next.js Developer, building APIs and frontend components while collaborating closely with senior developers.

DG PROJECT NUST

14-Aug-2023 - 15-Mar-2024

Worked with DRD NUST on the development of a national defense portal named DIRECT (Development, Innovation, and Research for Evolving Cutting-edge Technologies), designed to serve as a bridge between academia and industry. Contributed to both development and system implementation under the supervision of DG Project Major General Saeed and Group Captain Engineer Muhammad Saqaib. The project was formally approved by the Rector NUST and tested by ICT NUST, meeting institutional and technical standards.

indigenous researchanddevelopmentagency

09-Mar-2024 - 08-Aug-2025

Indigenous Research and Development Agency (IRADA) Worked as a Senior Developer, leading the development of the IRADA official website and the Pakistan Mineral Trade Portal. In addition to core development responsibilities, contributed to the proposal design and development of a mineral identification application aimed at supporting and enhancing the Pakistan Mineral Trade Portal. Collaborated with cross-functional teams to deliver scalable, secure, and user-focused digital solutions aligned with national objectives.

NUST Innovation & Commercialization Office (ICON)

12-Dec-2025 - 05-Feb-2026

Worked as a Data Analyst, responsible for analyzing and visualizing institutional data from different schools of NUST. Performed data cleaning, exploratory data analysis, and created meaningful visualizations to support insights and data-driven decision-making.

FINAL YEAR PROJECT

Drop assisted in crop disease detection, phenotyping and smart spraying

Ourfypfocuses on the development of a drop-assisted smartagriculturesystem formungbean crop that integrates crop disease detection, phenotyping, and intelligent spraying. The proposed system utilizes advanced image processing and computer vision techniques to analyze crop health at the leaf and canopy level. High-resolution images of mungbean plants are captured using drop- assisted sensing, which enhances image quality by reducing noise and improving feature visibility. These images are then processed
to detect common mungbean diseases at an early stage by identifying visual symptoms such as color changes, spots, and texture variations. In addition to disease detection, the system performs crop phenotyping, including the measurement of plant growth parameters such as leaf area, plant height, and biomass estimation. This phenotypic data helps in assessing crop vigor and overall health. Based on the detected disease severity and phenotyping results, a smart spraying mechanism is proposed that applies pesticides or nutrients only to a**ff**ected areas. This targeted spraying approach reduces chemical usage, minimizes environmental impact, and improves yield e**ffi**ciency. The overall objective of this project is to support precision agriculture by providing an automated, accurate, and resource-efficient solution for mungbean crop monitoring and management.

TECHNICAL EXPERTISE

Machine learning and Deep learning

Strongfoundationinmachine learning and deeplearning concepts, including supervised and unsupervised learning, neural networks, and model evaluation. Experienced in building, training, and optimizing models using Python and popular libraries such as TensorFlow, and scikit-learn. Skilled in data preprocessi ...

Next.js & MERN Stack

Proficientinfull-stackwebdevelopment using the MERN stack (MongoDB, Express.js, React.js, Node.js) and Next.js. Experienced in building scalable, SEO-friendly, and high-performance web applications with REST APIs, authentication, server-side rendering, and modern frontend architectures. Comfortable workin ...

Data Analytics

Experienced inanalyzing, cleaning, and visualizing data to extract actionable insights. Proficient in MS o**ffi**ce, Python, pandas, NumPy, and data visualization tools to identify trends, patterns, and correlations. Strong understanding of data-driven decision making, statistical analysis, and reporting for bus ...

Muhammad Zohaib Mustafa

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PROFESSIONAL PROFILE

Final-year undergraduate Electrical Engineering student at NUST with strong foundations in RTL design, computer architecture, embedded systems, and digital hardware design. Hands-on experience in RISC-V processor design, AMBA protocol implementation, FPGA-based RTL development, and embedded system prototyping through internships and academic projects. Seeking opportunities to apply digital design, embedded systems, and hardware verification skills in research-oriented or industry roles.

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering & Computer Sciences , Islamabad (2026)

INTERNSHIP EXPERIENCE

NUST Chip Design Center (NCDC)

15-Jun-2025 - 25-Sep-2025

Worked on C programming, RISC-V assembly, digital logic design, and computer architecture through structured projects. Designed and simulated a 32-bit RISC-V processor (single-cycle and pipelined) with hazard detection and forwarding mechanisms. Designed, implemented, and tested an AXI-to-APB protocol bridge enabling communication between AXI-based and APB-based modules. Performed RTL design, simulation, and verification using industry-standard EDA tools.

FINAL YEAR PROJECT

Optimization of Kyber (Post-Quantum Cryptography Algorithm)

Final Year Bachelor's Project focusing on post-quantum cryptography, specifically the NIST-approved Kyber algorithm. Analyzing the existing Kyber architecture to identify performance bottlenecks and optimization opportunities. Applying algorithmic and hardware-level optimization techniques to improve computational e**ffi**ciency and throughput. Implementing the optimized Kyber design on an FPGA platform to evaluate speed, latency, and hardware resource utilization. Contributing toward the development of secure and quantum-resistant cryptographic solutions for future systems.

TECHNICAL EXPERTISE

RTL & Digital Design

RTL Design, Verilog HDL, SystemVerilog, Digital Logic Design, FSMs, Computer Architecture, RISC-V Processor Design, Pipeline Architecture, Hazard Detection & Forwarding, AMBA AXI & APB Protocols

Embedded Systems

Embedded C, GPIO & Peripheral Interfacing, UART, SPI, I2C, Sensor Interfacing, Hardware Prototyping Microcontrollers: Arduino Uno, ATmega328P, ATmega16A, STM32, 9S12

Control Systems

PID Control, Automatic Voltage Regulation, Buck Converters, System Modeling & Simulation

Programming Languages

C, C++, Embedded C, Python, Verilog, SystemVerilog, Assembly Language, MATLAB

Development Tools & Platforms

Vivado, Intel Quartus Prime, ModelSim, Venus RISC-V Simulator, Arduino IDE, Atmel Studio, STM32CubeIDE, MATLAB/Simulink, Proteus, NI Multisim, PSpice, Git & GitHub, VS Code, Jupyter Notebook

Muhammad Abdullah

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at NUST with strong expertise in RISC-V architecture, embedded systems, and machine learning–based applications. Hands-on experience in RISC-V assembly, computer architecture, FPGA design, and SystemVerilog, along with practical exposure to machine learning and computer vision for intelligent systems. Proven ability to integrate hardware and software through academic projects and chip design training. Seeking opportunities to contribute to cutting-edge embedded, AI, and hardware-accelerated computing solutions.

EDUCATION

Bachelor of Electrical Engineering

School of Electrical Engineering and Computer Science , Islamabad , 3.24 (2026)

INTERNSHIP EXPERIENCE

NCDC, Islamabad

19-Feb-2025 - 10-Jun-2025

Trainee -Worked on chip design, C language, DLD concepts, RiscV Assembly and System Verilog

NUST Chip Design Centre

10-Jun-2025 - 29-Aug-2025

- Contributed to a RISC-V Vector Extension (RVV)–based SoC template design, focusing on processor architecture, vector execution flow, and hardware software interaction. - Developed and analyzed RISC-V assembly programs to validate architectural behavior and instruction-level execution. - Applied Digital Logic Design and Computer Architecture concepts to implement and verify RTL modules using SystemVerilog, supporting SoC integration and functional correctness.

FINAL YEAR PROJECT

Design and Verification of RISC-V Vector Processor IP

Designing and verifying a RISC-V Vector Processor IP based on the RISC-V Vector Extension (RVV). Implementing vector execution units and control logic using SystemVerilog, with functional verification through simulation and testbenches to ensure correctness and compliance with the RISC-V specification.

TECHNICAL EXPERTISE

Machine Learning & Computer Vision Projects

Academic & Certified Projects - Developed ML-based systems using Python and TensorFlow for intelligent control and automation tasks. - Implemented computer vision pipelines for object detection and tracking in embedded applications. - Integrated ML/CV models with hardware systems for real-time decision-m ...

Embedded Systems & FPGA Projects

Academic Projects - Implemented SPI protocol on FPGA using Verilog/SystemVerilog and verified functionality via simulation. - Designed embedded systems using microcontrollers (Arduino, ATmega) for automation and control applications. - Integrated sensors and control algorithms for real-time system respon ...

Chip Design & Computer Architecture Trainee

NUST Chip Design Center | Feb–Aug 2025 - Worked on RISC-V assembly, digital logic design, and computer architecture concepts. - Contributed to a RISC-V Vector Extension–based SoC template design. - Implemented and verified RTL modules using SystemVerilog. - Gained hands-on experience with processor data ...

RISC-V Vector Processor IP – Final Year Project

NUST | 2025–2026 - Designed and implemented a RISC-V Vector Processor IP based on the RISC-V Vector Extension (RVV). - Developed vector execution units, control logic, and datapath using SystemVerilog. - Performed functional verification using simulation-based testbenches to validate vector instructions. ...

Abeer Fiaz Hussain

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PROFESSIONAL PROFILE

Electrical Engineering Graduate | Biomedical Modeling, Machine Learning & Embedded Systems

Passionate about transforming research insights into innovative, real-world solutions.

With a strong foundation in *biomedical modeling, machine learning*, and *embedded systems*, I am a motivated and versatile engineering graduate passionate about transforming research insights into practical, cutting-edge solutions. I thrive on developing innovative projects that deliver tangible results and am eager to contribute technical expertise, drive meaningful impact, and grow professionally in dynamic, multidisciplinary environments.

EDUCATION

Bachelors of Electrical Engineering

National University of Science and Technology , Islamabad , 3.2 (2026)

INTERNSHIP EXPERIENCE

MiNE Lab

15-Jun-2025 - 15-Aug-2025

During my research-based internship, I worked on a non-invasive melanoma detection project using bioelectrical impedance analysis. The work involved developing a multilayer electrical model of human skin (stratum corneum, viable skin, and subcutaneous adipose tissue) using parameters extracted from peer-reviewed biomedical literature. COMSOL Multiphysics was used to simulate impedance responses of healthy and melanoma-affected tissue under surface electrode excitation. This experience developed my skills in biomedical modeling, impedance-based tissue analysis, simulation-driven research, and scientific documentation. I gained practical exposure to literature-based parameterization, result interpretation, and technical reporting within a research environment.

FINAL YEAR PROJECT

Skin Impedance Based Melanoma Detection

This project investigates a non-invasive method for melanoma detection using the electrical impedance properties of human skin. Melanoma causes changes in the structural and electrical characteristics of skin tissue, which can be reflected in measurable impedance variations. The skin is modeled as a multilayer structure consisting of the stratum corneum, viable skin (epidermis and dermis), adipose tissue and then muscle, with layer properties taken from published literature. Simulation-based analysis is used to compare impedance responses of healthy and melanoma-affected skin under surface electrode excitation. The study aims to evaluate the feasibility of skin impedance measurements as a low-cost screening approach for early melanoma detection.

TECHNICAL EXPERTISE

Research Intern – Skin-Impedance Melanoma Detection

Developed a multilayer human skin model and performed simulations in COMSOL Multiphysics to analyze impedance differences between healthy and melanoma-affected tissue. Applied bioelectrical impedance analysis, electrode-based measurements, data interpretation, and technical reporting.

Face-Detection Attendance System (Machine Learning)

Implemented an automated attendance system using face detection, including masked faces. Applied machine learning algorithms, data preprocessing, model training, and real-time application integration.

Movie Management System
Developedarobustobject-orientedapplication for movie record management, applying OOP principles, data structures, and CRUD operations.

Line-Following Robot
Builtanautonomousline-following robot using sensors and microcontrollers, developing skills in embedded systems, sensor interfacing, and algorithmic control.

UPS Design Using Transformers
Designedandbuiltatransformer-basedUPS system, gaining hands-on experience in circuit design, power electronics, and system testing.

Umer Farooq

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PROFESSIONAL PROFILE

Final-year Electrical Engineering student at the National University of Sciences and Technology (NUST), SEECS, with a strong academic foundation and a focused interest in chip design and computer architecture. Currently completing a Final Year Project in collaboration with the Nust Chip Design Centre (NCDC), gaining hands-on exposure to processor design, hardware architecture, and digital system development. Possess six months of industry-relevant experience at NCDC, including three months as a trainee followed by three months as a project intern, contributing to real-world research and development tasks in digital and VLSI systems. Demonstrated ability to work

in structured engineering environments, adapt quickly to complex technical challenges, and apply theoretical knowledge to practical implementations. Highly motivated to pursue a career in semiconductor design, processor architecture, and advanced digital systems, with a strong commitment to continuous learning and innovation in cutting-edge technologies.

EDUCATION

Electrical Engineering

SEECS Nust , Islamabad , 3.23 (2026)

INTERNSHIP EXPERIENCE

Nust ChipDesignCentre

18-Feb-2025 - 29-Aug-2025

Completed a six-month internship at NCDC, with the first three months as a trainee and the following three months as a project intern, during which we worked on a RISC-V RV32I processor

FINAL YEAR PROJECT

Design of a RISC-V based Symmetric Multi-processor Architecture

The project involves design, implementation and verification of a RISC-V based Symmetric multiprocessor (SMP) architecture. As processor’s frequency can’t be scaled beyond a certain limit without compromising on power consumption, multiprocessors is a promising solution for improving performance without compromising power consumption. Objectives: • Design a RISC-V based SMP architecture and simulating it in gem5 simulator for performance analysis • Implement the design in RTL and perform design verification in UVM • Physical design of the SMP architecture (RTL to GDS-II)

TECHNICAL EXPERTISE

RISC-V Processor Architecture & VLSI Design

Hands-on experience in the design, implementation, and verification of a RISC-V–based Symmetric Multiprocessor (SMP) architecture. Skilled in architectural modeling and performance evaluation using the gem5 simulator, with a focus on scalability and power-performance trade-offs. Proficient in RTL design and f ...

Hasnat Ahmed Gill

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PROFESSIONAL PROFILE

Electrical Engineering undergraduate with expertise in FPGA-based design and Verilog RTL. Research includes secure hardware design for cryptographic and post-quantum systems, RISC-V processors, computer architecture techniques for performance optimization and floating-point architecture. Skilled in algorithm-to-hardware mapping, MATLAB/Simulink modeling, and performance optimization for cryptographic and DSP applications.

EDUCATION

No education information provided.

INTERNSHIP EXPERIENCE

ESDAC ResearchLaboratoryNUST

17-Jun-2024 - 30-Aug-2024

Developed and deployed embedded software on Intel DE1-SoC board running an embedded Linux environment. I Implemented hardware–software co-design workflows for ARM–FPGA integration and then optimized Linux device drivers and peripheral interfacing for high-performance embedded applications. After that conducted cross-compilation and debugging using GCC toolchain and on-board JTAG/UART interfaces and contributed to research in real-time embedded systems and FPGA-based prototyping for industrial use cases.

System onChipLab

31-Aug-2024 - 30-Sep-2024

I have developed and implemented processor designs in Verilog to strengthen my understanding of computer architecture. My work includes designing and simulating digital systems with optimized multiplier architectures, such as Dadda and Wallace tree multipliers. I have also implemented digital encoding and signal processing modules on FPGA platforms for real-time hardware validation, gaining hands-on experience with FPGA design workflows, RTL development, simulation, synthesis, and digital logic optimization.

System onChipLab

23-Jun-2025 - 28-Jan-2026

I conducted research on secure hardware design for lightweight cryptography, focusing on the ASCON algorithm. I designed a hardware accelerator architecture for ASCON using Verilog RTL and implemented it on FPGA platforms. My work included developing key and nonce generation modules using LFSR-based randomness, as well as implementing the initialization and permutation rounds of the ASCON cipher on the DE1-SoC board. I also analyzed performance trade-o**ff**s in terms of area, throughput, and latency to evaluate and optimize the hardware cryptographic design.

FINAL YEAR PROJECT

No project information available.

TECHNICAL EXPERTISE

NUST SCHOOL OF ELECTRICAL ENGINEERING AND COMPUTER SCIENCE (SEECS)

NUST H-12
ISLAMABAD
seecs.nust.edu.pk