Ahsan Ali | Electrical/Electronics Engineer

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Education

Politecnico di Torino	**Torino, Italy**
MSc Electronics Engineering 24.4/30	*Oct 2023 - Present*
Habib University	**Karachi, Pakistan**
BSc in Electrical Engineering with Minor in Computer Science 3.77/4	*Aug 2018 - June 2022*

Work Experience

Electrical and Computer Engineering Dept, Habib University	**Karachi, Pakistan**
- *Research Assistant*	*June 2022 - Sep 2023*

Design, execution and improvement of lab courses of Power Electronics, Controls, Instrumentation, Micro-controllers and Embedded Systems, and assisting faculty with research and organizing conferences, workshops and lectures along with thesis projects

- *Embedded System Developer*	*June 2021 - Sep 2021*

Apprenticeship for nationally funded project. Hardware design, firmware development, deployment, and testing of IoT enabled low-cost water flow-metering system on ESP32 platform

Skills and Certification

Softwares Experience: MATLAB, Simulink, LabVIEW, LTspice, OrCAD PSpice, PCB Allegro/Presto, KiCAD, Cadence AWR/Axiem, Quartus Prime, ModelSim, Eclipse, NIOS-2, PSSE Xplore, Proteus, Cisco PT, Multsim, GX Developer, Wireshark, and Adobe Suite

Programming Languages: Python, C/C++, Embedded C, freeRTOS, Assembly, VHDL, Verilog, PLC Ladder, and TeX

IDE and Editors: Arduino IDE, Atmel Studio, Kiel uVision, Code Composer Studio, Espressif and VS Code

Hardware Experience: STM32 Nucelo, ESP32 boards, Arduino, FPGAs, ARM microcontrollers, DSPs, Mitsubishi PLC, CNCs, SDRs, Lathe machines, Quanser and DAQ Modules, Oscilloscopes, Keysight VNA, Spectrum Analyzer, PSUs, DMMs, Function Generators, and LabVolt Trainers

Management Tools: Office Suite, Excel, Word, LibreOffice, PowerPoint, Visio, PyTorch, Collab, and Mendeley

Certifications: IELTS 7.5 C1 Band, ETS GRE 302/340, PEC Registered Engineer

Others: IoT Applications, Technical Documentation, Datasheet Analysis, User Guides/Manuals, Scientific Reporting, Research and Development

Academic Projects

- **Hardware PCB Design for Smart ID System**: OrCAD Schematics, Allegro, Presto, and KiCAD-based PCB design with 5C pattern classification, Politecnico di Torino, Feb 2025
- **Design, Fabrication and Testing of Low-Pass Filter with AWR, AXIEM and Keysight VNA**: Equal Ripple 0.5dB LPF using T and Pi Networks, tested and simulated with AWR and Axiem to fabricate PCB circuit, analyzed with Keysight VNA, Politecnico di Torino, June 2024
- **Bidirectional DC-DC Converter Controlled via FPGA-in-Loop for EV Applications**: Simulink-based Rapid prototyping for PI Controller using HIL technique using FPGA to capture high dynamic response in transient and steady state behavior of power converter, Habib University, May 2022
- **Pressure Measurement System and Bubbler Setup**: Arduino-based DAQ, signal sensing, and processing to measure atmospheric pressure, Habib University, May 2021

- **DC-AC Volt Ohm Meter**: With USB Interfacing, Habib University, March 2021
- **Inverted Pendulum: Two Wheeled Self-Balancing Robot**: Mathematical Modelling, Digital PID Controller Design and Response Study of the system, Habib University, Dec 2020
- **Line Following Autonomous Robot**: Atmega328P and C++ based autonomous robot for navigation, perception, and action tasks integrated with sensors, actuators, and controllers, Habib University, Dec 2020
- **Fight Club Game**: video game using C++ and open-source SDL2.0, Habib University, June 2020
- **Rubik's Untangled**: Python3 with Tkinter library to implement Rubik's Cube Solver, Habib University, May 2019
- **FPGA Digital Trainer Board**: FPGA-based digital board with logical gates, I/O ports, segment displays, LCD, flip flops, and MPU 6050, Habib University, Dec 2019

Research and Publications

- **A. Ali** et al.,"Rapid Prototyping of Bidirectional DC-DC Converter Control using FPGA for Electric Vehicle Charging Applications," 2022 IEEE 13th International Symposium on Power Electronics for Distributed Generation Systems (PEDG), Kiel, Germany, 2022
- J. Ahmed Memon, A. Rehman, **A. Ali**, S. Shah and H. F. Khan, "Design and Implementation of Smart Flowmeter for Urban Water Metering," IECON 2022 – 48th Annual Conference of the IEEE Industrial Electronics Society, Brussels, Belgium, 2022
- **A. Ali** et al., "Hardware-in-Loop-enabled Controller Design for Isolated Boost Converter using Ziegler-Nichols Method for Electric Vehicle Applications," IECON 2023- 49th Annual Conference of the IEEE Industrial Electronics Society, Singapore, 2023
- M. A. Khan, M. H. Tariq, **A. Ali**, Y. A. Bakhtiar and T. Kamal, "Design and Implementation of Smart Inertial Profilometer System for Road Quality Assessment," IECON 2023- 49th Annual Conference of the IEEE Industrial Electronics Society, Singapore, 2023
- **A. Ali** et al., "Rapid Prototyping of Efficient FPGA-Based High-Frequency Synchronous DC-DC Buck Converter Control for Electric Vehicle Auxiliary Power Module," 2024 IEEE Workshop on Control and Modeling for Power Electronics (COMPEL), Lahore, Pakistan, 2024
- **A. Ali** et al., "Effects of Parasitic Elements in High Frequency GaN-based DC-DC Converters for Electric Vehicle Applications," 2023 25th International Multitopic Conference (INMIC), Lahore, Pakistan, 2023
- **A. Ali** et al., "FPGA-Enabled Rapid Prototyping of Isolated Bidirectional Full-Bridge DC-DC Converter Control for Electric Vehicle Applications," 2024 Horizons of Information Technology and Engineering (HITE), Lahore, Pakistan, 2024

Honors and Awards

- Best Undergraduate Research Award, Habib University, 2022
- High Academic Achievement Scholarship, Habib University, 2021 and 2022
- President's List Honor and Dean's List Honor, Habib University, Fall 2021 and Spring 2021
- IEEE IECON IES-SYPA 3M Video Winner, 2022
- Talent Outreach Program Scholarship, Habib University, 2018-2022
- DPEC Competition (1st Place) and Scientific Methods Research Poster Presentation (1st Place), Habib University, Fall 2019