MUHAMMAD HUZEFA FAROOQ, M.Eng.

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PROFESSIONAL SUMMARY

Graduate controls and mechatronics engineer with experience in automation, embedded systems, and building services. Comfortable with PLC and DDC programming, HMI development, sensor integration, and PCB design. Strong background in MATLAB based modeling and prototype development, with awards for innovative projects in robotics and surgical instrumentation. Brings practical experience from both industry and research and is ready to contribute to multidisciplinary engineering teams.

CORE SKILLS

- **Programming and Modeling:** C++, Python, MATLAB, Arduino
- **Automation and Control:** PLC (Ladder Logic) and DDC (Block Style) programming, HMI development, Tridium Niagara
- **Hardware and PCB:** Schematic design, PCB layout and testing, Proteus, basic Altium exposure, DAQ systems
- **CAD and Simulation:** SolidWorks, AutoCAD, basic Ansys and COMSOL exposure for analysis and validation
- **Instrumentation:** Sensor selection and calibration, I/O mapping, data acquisition and basic signal processing
- **Professional Skills:** Technical documentation, teamwork, leadership, time management, client communication

EDUCATION

M.Eng. Electrical and Computer Engineering May 2024 to Aug 2025
University of Windsor, Ontario, Canada

B.Eng. Mechatronics Engineering 2019 to 2023
National University of Sciences and Technology, Islamabad, Pakistan

PROFESSIONAL EXPERIENCE

Front Store Supervisor (Part-time) Jul 2024 – Present
Shoppers Drug Mart, Windsor

- Lead daily store operations and support a team of staff members in a fast-paced retail environment.
- Manage cash reconciliation, report preparation, and coordination with pharmacy and post office counters.
- Resolve customer issues and coordinate tasks to ensure smooth service during peak hours.
- Strengthen communication, leadership, and problem-solving skills that transfer directly into engineering project work.

Controls Engineer, HVAC and BAS Sep 2023 to Mar 2024
Blue Sky Automation, Lahore

- Developed control logic for air handling units and zone control using Tridium Niagara and DDC controllers.
- Configured graphics and HMI views for monitoring, alarms, and setpoint adjustment for building operators.
- Integrated field devices and third party systems through BACnet and Modbus and supported network level troubleshooting.
- Assisted with commissioning, point to point checks, and preparation of operation documents and basic standard procedures.

Undergraduate Researcher, Micro Nano Robotic Lab Sep 2022 to Aug 2023
National University of Sciences and Technology

- Designed and tested capacitive force sensors for use in robotic minimally invasive surgery tools.
- Developed PCB based data acquisition and a wireless feedback system with recorded error less than 8% in force readings.
- Designed the surgical tool to seamlessly integrate the custom data acquisition system and capacitive force sensor.
- Contributed to proposal writing and presentations that helped the team secure Ignite innovation funding.

Maintenance Intern Sep 2021 to Oct 2021
Atlas Honda, Sheikhupura

- Visited and studied multiple production facilities including the casting plant, engine plant, heat treatment area, fuel tank welding line, engine assembly hall, paint shop, waste heat recovery system, and frame assembly line to understand their processes and control requirements.

- Worked on the design of a cooling conveyor control system using a PLC, HMI interface, temperature sensor, and a variable frequency drive to improve line stability and system responsiveness.

ACADEMIC PROJECTS

Force Sensing Surgical Instrument for Robotic Surgery - Capstone Project

- Designed a laparoscopic grasper concept with integrated capacitive force and angle sensing for robotic surgery research.
- Developed PCB and DAQ electronics using ESP based hardware and sensor interface ICs for real time data streaming.
- Built a wearable haptic feedback band that provided tactile cues based on measured normal and shear forces.

Autonomous Fruit Plucking Robot- Team Lead

- Led the team responsible for designing and developing the robot for a national robotics competition.
- Designed the mechanical fruit plucking system including linkages, motion components, and actuation elements for reliable operation.
- Built and tested H bridge motor driver circuits and carried out required power and load calculations.
- Supervised system integration, testing, and troubleshooting which contributed to securing first runner up at NERC.

Single Active Bridge Converter Simulation

- Modeled a single active bridge converter in MATLAB and Simulink for applications in energy storage and EV charging systems.
- Implemented phase shift control and analyzed converter behaviour under different load conditions and current modes.

CERTIFICATIONS AND AWARDS

- **UR5 Collaborative Robot Workshop**, National Centre of Robotics and Automation, NUST
- **Honour Roll Recipient** in the Master of Engineering program at the University of Windsor
- **Ignite Grant Recipient** for innovative sensor technology
- **First runner up** at National Engineering Robotics Contest'22 for autonomous fruit plucking robot
- **High Achiever Award** at NUST for academic performance in top five percent of the class