MUAWWIZ ALI YOUSUF

Islamabad, Pakistan +92-315-0523269 engr.mayr@gmail.com mayrandhawa.github.io/
linkedin.com/in/Muawwiz-Ali-Yousuf

EDUCATION

University of Engineering and Technology Lahore **Expected, May 2025**
BSc. Mechatronics and Control Engineering *CGPA 3.72/4.00*

Jinnah Education System Taxila Cantt **August 2021**
FSc Pre-Engineering (FBISE) *Grade A1*

RESEARCH INTEREST

- Robotics & Automation
- Human-Robot Interaction
- Smart Manufacturing

WORK EXPERIENCE

Human Centered Robotics Lab (NCRA), UET Lahore **July 2024 - August 2024**
Mechatronics Intern *Lahore, Pakistan*

- Conducted research on SLAM (Simultaneous Localization and Mapping) navigation algorithms for autonomous mobile robots (AMRs).
- Integrated and configured multiple sensors (LiDAR and depth camera) with Jetson Nano controller using a Robot Operating System (ROS).
- Developed conceptual designs of an autonomous mobile robot (AMR) for healthcare and industrial applications, emphasizing cost-effective solutions through iterative design sketches.

Precision Manufaturing Pvt Ltd. **January 2024 - February 2024**
Design Trainee *Lahore, Pakistan*

- Designed and reverse engineered mechanical parts of military projects using SolidWorks.
- Overseen production and manufacturing processes in CNC workshop.

RADWI Electronics Pvt Ltd. **June 2023 - August 2023**
Embedded Systems Engineer Intern *Islamabad, Pakistan*

- Developed optimized ESP32 firmware for RFID-based smart lock integration and efficient data storage.
- Implemented UDP and MQTT protocols for efficient IoT communication.
- Debugged and tested prototypes, ensuring seamless embedded system performance.

Designmen Consulting Engineers Pvt Ltd. **August 2022**
HVAC Design & FLS Systems Intern *Islamabad, Pakistan*

- Gained hands-on experience in HVAC design, Fire & Life Safety (FLS) Systems, and AutoCAD drawings with site visits.
- Implemented cost-effective solutions, resulting in a reduction in project expenses.
- Coordinated project tasks, ensuring adherence to engineering standards and regulations.

RELATED PROJECTS

Autonomous Mobile Robot for Lab-to-Lab Sample Shifting | *Final Project, Robotics, ROS, SLAM*

- Developed an autonomous material-handling robot with LiDAR and depth cameras for real-time navigation and obstacle avoidance.
- Implemented SLAM in ROS for precise localization and dynamic path planning.
- Designed chassis and suspension, conducting FEA to support an 80-100 kg payload.
- Developed a mobile app and touchscreen interface for real-time monitoring and control.

Design & Analysis of Amber Lucid One Robot | *Robotics, SolidWorks, MATLAB & Simulink*

- Designed a detailed CAD model of the Amber Lucid One Robot (7-DOF) in SolidWorks.
- Performed static stress analysis to validate structural integrity under operational loads.
- Developed a MATLAB routine for seamless SolidWorks-to-Simulink Multibody import.
- Conducted dynamic simulations, including trajectory generation, using the Robotics System Toolbox.
- Analyzed position, velocity, and torque profiles to optimize motion and kinematics.

SMART Parking Lot Control System Using OpenPLC | *Automation, PLC Programming*

- Designed and implemented a SMART parking control system using OpenPLC with ladder logic.
- Integrated Arduino Mega for cost-effective PLC system simulation.

Ball Balancing on a Plate | *PID Control, MATLAB & Simulink*

- Designed and implemented a 3DOF 3RPS parallel manipulator for a ball balancing system.
- Developed and tuned PID controllers on Arduino for real-time motor control, ensuring stability and trajectory tracking.

Modeling & Simulation of Regenerative Braking System | *System Modeling, MATLAB & Simulink*

- Modeled a regenerative braking system for EVs, optimizing energy recovery and efficiency.
- Simulated dynamic behaviour in MATLAB/Simulink, analyzing performance across voltage, resistance, and gear ratios.

Portable Ventilator Using AMBU Bag | *Embedded System, Programming*

- Developed a Herringbone Rack-and-Pinion mechanism driven by a stepper motor and controlled via a TIVA Launchpad to compress the AMBU bag.
- Controlled the key ventilation parameters, i.e., tidal volume, respiratory rate, and inhale/exhale ratio.

Salah Pose Analysis Using Mediapipe and OpenCV | *Python*

- Developed a Python-based real-time Salah pose detection and tracking system using Mediapipe.
- Designed a tool to assist individuals and instructors with posture correction through real-time feedback.

ADDITIONAL PROJECTS

Ball Balancing on a Beam | *PID Control, MATLAB & Simulink*

Design and Simulation of Conveyor Belt System | *SolidWorks*

Autonomous Robot Navigation Using Genetic Algorithm | *C Language*

IoT Based Button (Switch Bot) | *Embedded System, TIVA Controller*

Creative Cardboard Ice Cream Cart walking Robot | *Toy, Product Design, Prototyping*

Automatic Pick and Place System | *Automation, Electro-Pneumatic*

IoT Based Security Alarm System | *Signal Conditioning*

Streamlined Audio Filtration and Analysis | *Signal Processing, MATLAB*

SKILLS

Programming
Robot Operating System (ROS) | Python | C Language | Arduino IDE | MATLAB | PLC Languages

Simulation
MATLAB & Simulink | ANSYS Workbench (Basic level) | Festo FluidSIM Hydraulic & Pneumatic

PCB Design
Proteus Professional

CAD Modelling
SolidWorks | AutoCAD | Mastercam

Other Software
Microsoft Office 365

CERTIFICATIONS & COURSES

SOLIDWORKS: Design for Mechatronics | *LinkedIn Learning* *Link*
AUTOCAD Training | *DigiSkills Training Program* *Link*
Python For Beginners Course In-Depth | *Udemy* *Link*
Safety in the Utility Industry | *University at Buffalo, The State University of New York - Coursera* *Link*
Fundamentals of Lean | *LeanScape* *Link*
Lean Thinking Business Course | *LeanScape* *Link*
Problem Solving Using Computational Thinking | *University of Michigan - Coursera* *Link*
Project Management Foundations | *LinkedIn Learning - NASBA* *Link*
Optimizing Your Work with Microsoft 365 | *LinkedIn Learning* *Link*

HONOURS & AWARDS

- Awarded the FEB & GIF Educational Grant of PKR 80,000 annually (2021–2025).
- Received a merit-based laptop under the PMYLS program (2023).
- Secured a PKR 40,000 merit scholarship for the highest GPA in the second semester (2022).
- Honoured with the UET 100 Years of Academic Excellence coin for an A+ in Computer Programming Course (2022).
- Achieved 1st position for a Popsicle Truss Bridge design bearing 130 lbs (2022).
- Won 1st position in Mechanical 2D/Isometric Drawing using AutoCAD in TechnoWar (2022).
- Achieved 10th position in Pakistan at the International Bebras Informatics Contest (IBIC), earning a Three-Star Performance Badge (2019).

EXTRACURRICULAR ACTIVITIES

Entrepreneurship In Engineering (Webinar) | *Mechatronics Club, UET Lahore*

Report Writing: Space Journalism | *World Space Week, Institute of Space Technology (SUPARCO)*

Excellent Reading Skills - English | *Jinnah Education System (JES)*

Artist of the Year | *Jinnah Education System (JES)*

Gymnast - Annual Sports | *Jinnah Education System (JES)*

PUBLICATIONS

Muawwiz Ali Yousuf, Mohammad Saad Yaseen, Muhammad Rafay, & Dr. Ali Raza. (2025). *Autonomous Mobile Robot for Lab-to-Lab Sample Shifting*. Undergraduate Thesis, University of Engineering and Technology Lahore. (under progress)

LANGUAGE PROFICIENCY

- English - Fluent
- Urdu - Native

REFERENCES

Dr. Ali Raza
Chairman, Associate Professor at Department of Mechatronics & Control Engineering, Main Campus UET Lahore, Pakistan
aliraza@uet.edu.pk +92-331-4030312

Dr. Muhammad Ahsan
Associate Professor at Department of Mechatronics & Control Engineering, Main Campus UET Lahore, Pakistan
m.ahsan@uet.edu.pk