

Frais Asghar

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SUMMARY:

Driven Mechanical Engineering student with a strong foundation in robotics, simulation, and intelligent systems. Experienced in designing and implementing real-time control systems, hybrid energy solutions, and data-driven models using tools like Arduino, Python, and ANSYS. Committed to solving complex engineering problems through a blend of mechanical design, programming, and analytical thinking.

EDUCATION

National University of Sciences & Technology (NUST)
Bachelor of Engineering in Mechanical Engineering (4th Semester)

Islamabad, Sept. 2024 - Present

City College of Science & Commerce
F.Sc. Pre-Engineering (Percentage: 87.67)

Multan, 2022-2024

Ansari Science High School
Matriculation (Percentage: 98.45)

Multan, 2020-2022

PROJECTS

Self-Balancing Robot with PID Control:

• April 2026

- Built a 2WD robotic system utilizing an IMU sensor and ultrasonic sensors for obstacle avoidance.
- Engineered and validated PID control loop to achieve autonomous upright stability and real-time balance.
- Simulated the dynamic stability of the robot to optimize response time and minimize oscillatory behavior.
- Tools and Technologies:** C++, Arduino, PID Control, IMU Sensors, Robotics.

4WD High-Speed Arduino Robotic Vehicle:

• Feb. 2026

- Designed a 4WD high speed robotic platform capable of high traction and stable performance.
- Integrated an Arduino based control system for real time motor synchronization and power management.
- Optimized chassis geometry for weight distribution and structural integrity during high speed maneuvers.
- Tools and Technologies:** Arduino, Motor Drivers, Power Electronics, Mechanical Design, Embedded Systems.

Structural Analysis of Truss Systems:

• April 2025

- Performed structural analysis on complex truss configurations using both ANSYS and theoretical hand calculations.
- Evaluated nodal displacements, member stresses, and factors of safety under varying load conditions.
- Validated FEA results against analytical solutions to ensure high precision in mechanical design verification.
- Tools and Technologies:** ANSYS Mechanical, FEA, Applied Mechanics, Engineering Mathematics.

Personal Gym Trainer & Health Management System:

• May 2025

- Engineered a modular C++ application delivering personalized fitness and dietary recommendations.
- Implemented conditional logic to automate BMI & daily caloric calculations and weekly workout plans.
- Utilized switch-case structures, for-loops, and function design to ensure code reusability.
- Tools and Technologies:** C++, Object-Oriented Logic, Integrated Development Environment.

Machine Learning Stock Classification System:

• Dec. 2024

- Developed a machine learning pipeline using Python to classify and forecast stock patterns based on trading volume.
- Applied Decision Trees, KNN, and Linear Regression to evaluate and compare model performance.
- Conducted comprehensive Data using Seaborn and Matplotlib to visualize feature correlations and normal distributions.
- Tools and Technologies:** Python, Scikit-Learn, Pandas, NumPy, Matplotlib, Decision Tree Classifiers.

Mechanical Shaft and Support Component Design:

• Dec. 2024

- Engineered a mechanical shaft assembly with precise geometric tolerances and support features using CAD software.
- Applied mechanical design principles to ensure the assembly could withstand operational torque and rotational stresses.
- Generated detailed technical drawings for manufacturing, focusing on fit, finish, and assembly constraints.
- Tools and Technologies:** AutoCAD, Geometric Dimensioning and Tolerancing (GD&T), Manufacturing Engineering.

Relevant Coursework:

- Core Engineering:** Thermodynamics, Fluid Mechanics, Mechanics of Materials, Engineering Mechanics.
- Design & Materials:** Engineering Drawing, Material Engineering, Engineering Dynamics.
- Systems & Programming:** Computer Systems & Programming, Electrical & Electronics Engineering.
- Applied Mathematics:** Numerical Analysis, Complex Variables & Transforms, Linear Algebra & Differential Equations.

TOOLS & SKILLS:

Microcontrollers: ESP32, Arduino.

Programming Languages: C/C++, Python, MATLAB, Maplesoft.

Developer Tools: Git & GitHub, VS Code, Jupyter Notebook, Arduino IDE.

Tools & Simulations: SolidWorks, AutoCAD, ANSYS, CFD, OpenBom, EES, Primavera P6, Proteus 9.

Soft Skills: Project Management, Teamwork & Leadership, Complex Problem Solving, Technical Report Writing, Troubleshooting.