TAIMOUR ZAHID

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LinkedIn | Mechanical Design Portfolio | GitHub

EDUCATION

NATIONAL UNIVERSITY OF SCIENCES AND TECHNOLOGY Islamabad, PK
Bachelor of Science Expected June 2026
Major in Mechanical Engineering
Relevant Coursework: Computer Aided Design (CAD), Mechanics of Materials & Machines, Control Systems and Robotics, Computational Fluid Dynamics, Thermodynamics, Heat and Mass Transfer.

WORK EXPERIENCE

VISIONRD Islamabad, PK
Industrial Design Engineering Intern Jun 2025 – Sept 2025

- Led complete hardware design and integration of an AI-enabled wearable device for automated supervision in industrial assembly, from concept to deployment-ready prototype.
- Conducted finite element analysis (FEA) to evaluate mechanical durability and fracture resistance of stretchable components under repetitive deformation cycles.
- Secured contract with **Haval Automotive** by delivering a wearable device solution that reduced assembly time by 50%, significantly enhancing manufacturing efficiency.
- Collaborated with cross-functional software and manufacturing teams to deliver field-ready prototype under accelerated development timelines.

NATIONAL CENTRE OF ROBOTICS AND AUTOMATION (NCRA) Islamabad, PK
Design Engineering Intern Jul 2024 – Aug 2024

- Reverse-engineered complete field seeder machine through dimensional analysis and measurement, creating comprehensive SolidWorks CAD model from physical prototype.
- Redesigned joint geometry and optimized dynamic performance parameters for bionic hand prototype, improving grip functionality and motion range.
- Executed complete design-to-test cycle for bionic hand components, including SolidWorks modeling, 3D printing fabrication, performance evaluation, and iterative design optimization to achieve target mechanical specifications.

ONGOING RESEARCH WORK

DESIGN AND DEVELOPMENT OF VELOX BOT - A BIOMIMETIC AMPHIBIOUS ROBOT Islamabad, PK
Final Year Project (Ongoing) Expected April 2026

- Investigating biomimetic locomotion strategies to design an amphibious robot capable of seamless operation in both terrestrial and aquatic environments.
- Conducting CAD modeling, CFD, and FEA to optimize hydrodynamic performance and structural integrity across multiple design iterations.
- Developing a complex control architecture to enable autonomous adaptability, with targeted applications in search and rescue operations and exploration of unstructured environments.
- Research efforts directed toward academic publication and potential patent filing.

UNIVERSITY PROJECTS

EHPVC DESIGN AND SIMULATION *(Team Lead)* May 2025
Machine Design

- Placed first in the Electric Human Powered Vehicle Challenge (EHPVC) competition among 10 teams.
- Served as overall project lead and head of design, responsible for conceptualizing, designing, and developing the vehicle from scratch.
- Executed full 3D CAD modeling, performed CFD simulations for aerodynamic optimization, and conducted FEA to ensure structural integrity under load.
- Led the fabrication process, coordinating mechanical, electrical, and manufacturing teams to deliver a functional, competition-ready prototype.

HIGH-PRECISION WIND TUNNEL *(Awarded Best Project in the Batch)* May 2024
Fluid Mechanics

- Designed and fabricated custom wind tunnel prototype emphasizing precision drag and lift force measurement through pressure differential calculations and anemometer-based airflow estimation.
- Developed comprehensive testing apparatus enabling accurate aerodynamic force analysis and experimental validation of fluid mechanics principles.
- Achieved Best Project recognition for innovative mechanical design, large-scale fabrication expertise, and contribution to experimental fluid dynamics research.

STRESS & FAILURE ANALYSIS OF OCEANGATE TITAN SUBMERSIBLE Dec 2024
Mechanics of Materials

- Designed comprehensive 3D CAD model and performed advanced structural analysis of carbon fiber epoxy pressure hull under 4000m deep-sea pressure conditions.
- Conducted detailed analytical assessment of principal stresses and failure modes through manual application of von Mises, Tresca, and Tsai-Wu failure criteria, validating composite material performance under 4000m deep-sea pressure loading.
- Delivered critical engineering insights into real-world catastrophic failure, demonstrating expertise in high-pressure vessel design and composite material analysis.

AUTOMATED WIND TUNNEL CONTROL SYSTEM Dec 2024
Control Systems

- Designed and implemented fully automated control system using Arduino microcontroller for precise angular positioning and orientation adjustment of test objects during aerodynamic testing.
- Integrated servo motor control algorithms and sensor feedback loops to achieve accurate positioning repeatability for consistent experimental conditions.
- Developed automated data acquisition system enabling efficient collection of force measurements and streamlined aerodynamic performance analysis workflows.

RESEARCH COLLABORATION

CUSTOM PCB ENCLOSURE DESIGN FOR LOW-COST HOLTER MONITOR Islamabad, PK
Mechanical Design Engineer May 2025

- Designed custom 3D CAD enclosure for Low-Cost Holter monitor as part of interdisciplinary biomedical device research, ensuring secure PCB integration and manufacturing feasibility.
- Collaborated with electrical engineering researchers to optimize mechanical design for medical device standards and patient usability requirements.
- Delivered functional prototype achieving all design specifications on first iteration, contributing to ongoing biomedical device development research.

ACTIVITIES

ASME CEME STUDENT SECTION Islamabad, PK
Design Engineer Nov 2023 – Present

- Designed technically complex autonomous robot testing maze in SolidWorks, incorporating geometric challenges (sharp turns, bifurcations, layered intersections) and ROS integration for navigation algorithm benchmarking.
- Provided CAD and mechanical design support for robotics systems, including assembly modeling, tolerance analysis, and layout optimization to meet functional and manufacturing requirements.

ADDITIONAL

Technical Skills

- CAD & Design: SolidWorks (Advanced), AutoCAD, 3D Printing & Additive Manufacturing
- Analysis & Simulation: Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), ANSYS
- Programming & Control: MATLAB, Arduino Programming, Python

Certifications and Training

- McKinsey Forward Program, 2023
- Six Sigma Yellow Belt, 2023

Awards

- First Place - Electric Human Powered Vehicle Challenge (EHPVC), 2025
- NUST High Achiever Award, 2023