Muhammad Ahmed

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Objective: With a background in mechanical design and embedded programming, I am passionate about advancing autonomous systems. My goal is to make significant contributions to projects involving autonomous systems, building upon my work in environmental perception and dynamic systems. I am eager to collaborate with teams that prioritize continual learning and the deployment of cutting-edge robotics technologies, with the shared vision of innovating the future landscape of autonomous systems.

Education

Middle East Technical University — Ankara, Turkey
B.Sc. in Mechanical Engineering — *Sep 2020 – Jun 2024*
Specialization in Intelligent Systems — *Dean's Honor List*

Cedar College — Karachi, Pakistan
GCE A and O Levels; ***GPA: 4.0/4.0*** — *Sep 2018 – Jun 2020*

Work Experience

Hidroan — Ankara, Turkey
Robotics Engineering Intern — *Jun 2023 – Present*

- Researched, built, and integrated a Simultaneous Localization and Mapping (SLAM) system achieving 70% accuracy in mapping and localization.
- Developed packages for Sensor Fusion, enabling integration and synchronization of various sensors.
- Worked with a multitude of sensors including LIDAR, IMU, Depth Cameras, GPS, and others for comprehensive environment sensing.
- Expertly utilized ROS2, the Navigation Stack, and Google Cartographer for advanced mapping and navigation tasks.
- Authored and maintained packages and modules for sensor data management in C++ and Python.
- Configured and refined the simulation environment, enhancing the fidelity and effectiveness of testing protocols.
- Prepared and delivered insightful reports, aiding stakeholders in strategic decision-making processes.

WootTech Aerospace — Karachi, Pakistan
Mechanical Design Engineer Intern — *Jan 2023 – March 2023*

- Designed V-tail and Tandem Wing UAVs
- Extensively used Solidworks and Ansys for structural analysis; achieved a 60% reduction in material cost using Mechanical design Topology Techniques.
- Conducted research and developed innovative folding mechanisms for tube-launched UAVs, including FEA on critical components like springs.
- Focused on designing parts to minimize both weight and manufacturing costs, aligning with project budget and performance goals.
- Implemented Management of Change (MOC) principles to ensure smooth transition and adaptation to new processes and designs.
- Gained hands-on experience with rapid prototyping techniques, including laser cutting and 3D printing technologies.
- Compiled comprehensive reports for stakeholders, providing essential data to support strategic decision-making processes.

Gamak Makina Sanayi A.Ş — Istanbul, Turkey
Manufacturing Engineer Intern — *Aug 2022 – October 2022*

- Acquired extensive knowledge of the manufacturing process with CNC machines, applying statistical analysis to production data and achieving a 30% increase in overall efficiency.
- Designed parts to streamline manufacturing time, resulting in a significant 60% time reduction.
- Conducted Tangent Delta Tests to ensure the reliability of cable insulation.
- Mastered coil winding and forming processes, essential for the production of electrical components.
- Performed cost analysis, identifying enhancements leading to a 5% reduction in production expenses.
- Learned the intricacies of project reporting, enhancing transparency and stakeholder communication.

- Implemented the 5S methodology to optimize organization and efficiency in the production plant.

Integrated Dynamics Aerospace Karachi, Pakistan

Mechanical Design Engineer Intern *Jun 2022 – July 2022*

- Engineered Ground Control Stations for Tethered Drones, achieving a 60% reduction in assembly time through design optimization.
- Developed custom drone packaging solutions, selecting materials that cut costs by 30% without compromising product safety.
- Designed and executed Finite Element Method (FEM) analysis on Tandem Wing UAVs to validate structural integrity.
- Configured flight controls and established protocols for Ground Control Stations, ensuring seamless UAV operations.
- Drafted comprehensive Statements of Work and managed project timelines using Gantt charts for effective project tracking.
- Utilized laser cutting and advanced rapid prototyping techniques to accelerate development and testing phases.

Open Source Work

- Created a simulation for autonomous tracking and target following in a quad-wheeler, with the code on GitHub for community use and adaptation.
- Programmed a Pioneer P3-Dx robot simulation using the Advanced Potential Field Algorithm for goal-oriented navigation and obstacle avoidance, with source code on GitHub.

Awards & Achievements

Teknofest UAV Design Competition: Awarded by Teknofest for designing a Fixed Wing UAV and developing Flight Control Systems – July 2022.

Innovative Mechanical Design: Secured Third Position in European BEST Engineering Competition for designing a cost-effective Fire Rescue vehicle – April 2022.

Academic Excellence: Amongst the Top 10 Students in Pakistan to secure admission to Ghulam Ishaq Khan Institute – June 2020.

Skills

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

Microprocessor Programming: Arduino

Machine Learning: Deep Learning Libraries, Image Classification, Object Detection

Robotics Framework: ROS2

System Operation: Linux/Command Line

Version Control: GitHub

CAD & CAE Tools: Solidworks, NX Siemens, AutoCAD

Manufacturing Technologies: RDWorks, 3D Printing, CNC Machines, Laser Cutting

Engineering Analysis: Ansys Static Structural Analysis, GDT, FEA analysis

Languages: English (Full Professional Proficiency), Urdu/Hindi (Native), Turkish (A2 Level), German (A1 Level)

Certifications

Google Professional Data Analysis Certification: Developed strong analytical skills and expertise in data analysis tools and technologies. – Jun Nov 2021.

Machine Learning and its Applications - National University of Singapore: Gained comprehensive knowledge in machine learning algorithms and their real-world applications.– Oct 2022.

Volunteer Work

- Conducted educational workshops in Robotics and Programming for underprivileged youth within my community.
- Taught them Python and Arduino programming to solve real-life problems.
- Presented seminars focused on strategies for successful university examination preparation.