RAYYAN KHALID

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https://rayyankhalid7777.github.io/portfolio/

SUMMARY

Aspiring Mechanical Engineer with a solid foundation in design, manufacturing, and systems analysis, complemented by hands-on experience in advanced CAD modeling, CNC machining, and data science. Eager to apply analytical and creative skills in a dynamic engineering role to contribute to sustainable technological solutions.

EDUCATION

UNIVERSITY OF CALIFORNIA, SAN DIEGO Expected: June 2025
Bachelor of Science. in Mechanical Engineering, ***Specialization:*** Control & Robotics, ***Minor:*** Data Science

- GPA: 3.71 | Provost Honors | ASME

SKILLS

TECHNICAL: Design and Modeling, Mechanical Systems, Robotics, Signal Processing, Thermal Analysis, Microsoft 365
FABRICATION: CNC (Mill, Lathe) and Manual, soldering, Band Saw, 3D printing, Laser Cutting, Drill Press, Woodworking
SOFTWARE: Fusion 360, SolidWorks, AutoCAD, Ansys, MATLAB, Arduino, ROS2, Embedded Linux, Python, Kinovea
LANGUAGES: English (Fluent), Urdu (Native), Hindi (Conversational), Punjabi (Conversational), Arabic (Beginner)

WORK EXPERIENCE

MECHANICAL ENGINEER INTERN - FUSION SYSTEMS DESIGN Feb 2025 - Present
General Atomics San Diego, CA

- Currently leading the design, risk analysis, and iterative development of critical components for the "Sabot" Autoloader and Recovery System, aimed at optimizing the performance of inertial fusion energy target injectors.
- Utilizing 3D CAD and animation tools such as SolidWorks and Fusion360 to create detailed designs and visualizations.
- Conducting Finite Element Analysis (FEA) using Ansys to assess structural integrity and identify potential failure modes under cryogenic and vacuum conditions, ensuring robust system performance.
- Spearheading the integration of actuation and sensor systems to enhance precision and reliability of the "Sabot" Autoloader. Successfully implemented a stepper motor setup, utilizing Arduino Uno and related electronic components, to automate the precise positioning and movement of fusion targets through cryogenic dunking and inspection phases.

ENGINEERING INTERN June 2024 - Aug 2024
Roofline Group of Companies Lahore, Pakistan

- Enhanced product reliability by 25% using tensile testing machines and penetrometers, and decreased test execution times by 30% through proficient use of laboratory ovens and reverse flow viscometers.
- Assisted in the overhaul of critical equipment, including compressors and turbines, achieving a 20% improvement in equipment reliability and extending operational lifespans by over 30%.
- Instituted rigorous safety measures for handling high-temperature equipment and chemicals, reducing workplace incidents by 40% during the internship period.

PROJECTS

AUTONOMOUS CAR DEVELOPMENT

- Fabricated a 1/8-scale autonomous vehicle, focusing on robotics system integration for enhanced autonomous navigation.
- Successfully programmed and tested autonomous driving algorithms using GNSS and deep learning techniques.
- Enhanced obstacle detection precision by 25% through machine learning algorithms and computer vision techniques.
- Implemented ROS2 with LiDAR-based SLAM to create dynamic 3D mapping, improving navigation accuracy by 30%.

ROBOT DESIGN COMPETITION

- Spearheaded the development of a space-efficient robot for the MAE Smart Lockers Contest, guiding a team through the design, fabrication, and deployment phases, resulting in top recognition in a competitive university contest.
- Conceived and implemented a dual L-shaped hook mechanism for multi-object transportation, boosting efficiency by 40%.

RECTILINEAR POSITION CONTROL ANALYSIS

- Developed a Linear Time Invariant (LTI) model for a two-cart system, achieving a 95% match between the simulated output and observed performance, thereby validating the model's accuracy using MATLAB.
- Designed and implemented a PID controller that reduced system overshoot by over 30% and improved settling time by 25%, enhancing system responsiveness and stability.

EXTRACURRICULAR EXPERIENCE

FINANCE CHAIR Oct 2021 - Aug 2022
Pakistan Student Association @ UCSD San Diego, California

- Spearheaded budget management and funding strategies for the Pakistani Student Association, achieving a 10% increase in organizational funds through effective collaborations and fundraising initiatives.