RAYYAN KHALID

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

SUMMARY

Aspiring Mechanical Engineer with a solid foundation in mechanical design, prototyping, and fabrication. Skilled in CAD modeling, FEA and hands-on machining. Proven ability to lead projects from concept to test. Eager to apply analytical and creative skills in a dynamic engineering role to contribute to sustainable technological solutions with real-world impact.

EDUCATION

UNIVERSITY OF CALIFORNIA, SAN DIEGO Sept 2021 - June 2025
Bachelor of Science. in Mechanical Engineering, ***Specialization:*** Control & Robotics, ***Minor:*** Data Science
- GPA: 3.7 | Provost Honors | ASME

SKILLS

TECHNICAL: Design & Modeling, Mechanical Testing, Rapid Prototyping, DFM, Root Cause Analysis, Microsoft 365
FABRICATION: CNC & Manual Machining, Power tools, 3D printing, Laser Cutting, Water Jetting, Soldering, 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

TECHNICAL INTERN July 2025 - Present
Footprint Project New Orleans, LA
- Prototype, test, and troubleshoot solar-powered generators and install mobile microgrid systems for communities in need.
- Develop and implement a water filtration trailer to provide 1000 gallon/day clean water in off-grid and emergency settings.
- Design and build a non-invasive web-based energy monitoring system to track performance, location, and operational data across a fleet of 25+ deployed energy systems, improving operational oversight and maintenance efficiency.

MECHANICAL ENGINEER INTERN - FUSION SYSTEMS DESIGN (Capstone Project) Feb 2025 - June 2025
General Atomics San Diego, CA
- Designed, modeled and fabricated a 6-component autoloader system for fusion targets, achieving autonomous transfer and ejection of 4.5 mm IFE targets at a frequency of 0.25 Hz, meeting design specs for vacuum and cryogenic compatibility.
- Engineered a precision rotary disk system with integrated impeller vanes to achieve controlled singulation and axial transfer of fusion targets; optimized geometry for passive alignment, jamming mitigation, and downstream compatibility.
- Wired and programmed stepper motors and solenoid with Arduino Uno for synchronized actuation of rotary disk, impeller, and gates; reduced misalignment rate to <5% during final validation tests.
- Created technical documentation including timing diagrams, force calculations, and integration roadmap to support handoff for Phase 2 system development.

ENGINEERING INTERN June 2024 - Aug 2024
Roofline Group of Companies Lahore, Pakistan
- Improved membrane product reliability by 25% through tensile and penetration testing using UTM and penetrometer; boosted QC efficiency by 30% via streamlined use of lab ovens, electric furnaces, and reverse flow viscometers.
- Collaborated with a maintenance team to inspect and maintain key production systems (e.g., mixers, pumps, and extrusion lines), contributing to a 20% improvement in operational reliability and reducing equipment downtime.
- Conducted standardized material property tests including softening point (Ring & Ball), flash point, ash content, and kinematic viscosity to validate compliance with ASTM standards (ASTM D36, D92, D3174, D2170) for waterproofing membranes.

PROJECTS

RECTILINEAR POSITION CONTROL ANALYSIS Jan 2025 - Feb 2025
- 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 tuned a PID controller that reduced system overshoot by over 30% and improved settling time by 25%, enhancing control system responsiveness and stability.

AUTONOMOUS CAR DEVELOPMENT Sept 2024 - Dec 2024
- Built and integrated 1/8-scale autonomous vehicle using Jetson Nano, motor drivers, sensors, and microcontrollers.
- Developed and tested autonomous navigation stack using GNSS and convolutional neural networks for lane/obstacle detection.
- Boosted obstacle detection accuracy by 25% through computer vision optimization using OpenCV and CNN-based classifiers.
- Deployed ROS2-based LiDAR SLAM for real-time 3D mapping and localization, increasing navigation precision by 30%.

ROBOT DESIGN COMPETITION Jan 2024 - Mar 2024
- Led design and fabrication of a compact servo-driven robot for MAE Smart Lockers Contest, coordinating end-to-end development using CAD and rapid prototyping (3D printing, laser cutting) to achieve top-tier performance.
- Designed and deployed dual L-hook pickup system for transporting multiple items, increasing retrieval efficiency by 40%.