HEMAN

LinkedIn | Portfolio | Medium | Email: sainiheman.94@gmail.com | Phone: +1 (951) 548-4124

Summary

Robotics Engineer with expertise in **robotic system integration**, **motion planning**, and **AI-driven perception systems**. Experienced in designing, simulating, and implementing robotics applications for automation and innovative solutions. Passionate about transforming manufacturing and process operations with cutting-edge robotics technology.

Education

University of California, Riverside Sept 2023-Dec 2024

Master's in Robotics, Automation, and Mechatronics

Major: Robotics, Focus: Artificial Intelligence and Perception

Relevant Coursework: Advanced Computer vision, Trustworthy Artificial Intelligence, Fundamentals of Deep Learning

Maharshi Dayanand University, India Jul 2017-Jul 2021

Bachelor of Technology in Mechanical Engineering

Skills

Software Tools

- **Design and Simulation Tools:** Solidworks(CSWA), AutoCAD, Autodesk Fusion, Catia, Creo, Ansys.
- **Robotics Simulation:** Gazebo, Rviz, Moveit, SLAM, Point Cloud Library, Carla.

Operating System

- Linux, Windows, Raspberry Pi.

Soft Skills

- Project Management, Problem-Solving, Time Management

Programming and Software Tools

- **Languages:** Python, C/C++, HTML, CSS, Matlab.
- **Frameworks:** ROS1, ROS2, Arduino.
- **Development Tools:** Docker, Git, AWS, Jenkins.

Technical Skills

- **Machining:**Welding, Lathe Machine, Sheet Metal, CNC Machine, Rapid Prototyping.
- **Design analysis:** DFA, DFM, GD&T.

Experience

Orangewood Labs (YC-18) , India June 2024 - Aug 2024

Robotic Software Engineer-Intern (Remote)

- Utilized **PCL** for advanced **3D point cloud processing** and integrated **MoveIt!** for efficient motion planning and trajectory optimization, enabling precise environment mapping and improved robotic system performance.
- Developed **C++** automation scripts for the ROS-based AutoSpray Robot, enhancing on-the-go navigation and **motion planning** capabilities.

EFEV Charging Solutions Pvt Ltd., Sonipat, India Dec 2022 - Sept 2023

Design Engineer (Research and Development Department)

- Led three-wheeler **EV design** project, made vehicle matching to ISO 9001/14001 standards using **SolidWorks** and **CATIA** for **3D modeling**, ensuring compliance with vehicle standards and manufacturing quality.
- Managed **SAP ERP** for **BOM** to streamline procurement. Conducted **FEA** with **ANSYS** for structural integrity and cost-effective material selection in **NPD**.

Greenvolt Mobility LLP, Ahmedabad, India June 2021 - Nov 2021

Mechanical Engineer Intern (Research and Development Department)

- **Data Acquisition Device:** Designed a device for capturing driving scenarios on Indian roads, essential for training autonomous vehicle algorithms. Demonstrated skills in sensor integration and data acquisition.
- **EV Testing System:** Developed a testing system to evaluate motor, controller, and battery pack performance. Showcased expertise in system integration, testing, and performance evaluation.
- **Telescopic Suspension Design:** Contributed to the design of a **telescopic suspension** system for two-wheelers, focusing on **mechanical design**, **ergonomics**, and **vehicle dynamics**.

Projects

Teleoperation (Inprogress-University of California, Riverside *Guidance: Professor Mingyu cai*)

- **Led Robotics Lab:** Directed lab operations and coordinated a team to advance teleoperation research and development.
- **Enhanced Action Recognition & System Integration:** Developed MAML models using TSM features and RGB data for improved action recognition; implemented imitation learning on the Aloha v2 kit and integrated force sensors into CAD designs, boosting robot autonomy and functionality.

Sensor Development (University of California, Riverside *Guidance: Professor Jun sheng*)

- Conducting research to develop sensors for soft robots under Professor Jun Sheng, focusing on measuring resistance to length changes.

Depth-Based Object Localization and Manipulation with a Kinova Arm

- Developed an integrated system using **ROS, MoveIt!**, and **a Kinova Gen3 Lite** robotic arm with a **Robotiq 2F-140** gripper for real-time object detection via **Darknet ROS** and precise **3D localization** with point cloud processing. Implemented a two-step motion planning to pick-and-place operations. Github Link || Medium

Kinematic & Dynamics of Kinova_gen3 (*University of California, Riverside*)

- Designed and fabricated a 4-degree-of-freedom robotic arm using **SolidWorks** and **3D printing** for rapid prototyping. Implemented advanced kinematics algorithms in Python and **MATLAB** for precise motion control, integrated with Arduino and ROS for real-time interfacing. Github Link || Medium

Quadruped Robot (Inprogress-Class Project- *University of California, Riverside*)

- Designed and developed a 4-legged robot for dynamic movement using **SolidWorks**. Implemented **Gazebo** and **ROS** for simulation and control.

Real-time Driver Behavior Detection (Class Project- *University of California, Riverside*)

- Developed a real-time driver attentiveness detection system using **Python, OpenCV**, and **deep neural networks** for immediate safety interventions. Github Link
- Engineered algorithms for real-time data processing and computer vision analysis to enhance driver focus and safety.

Extracurricular Activities

- **Hackathon Champion:** 1st place at CipherSchools Hackathon, August 2020
- **Science Competition Winner:** 2nd place, Department of Environment of Science
- **Athletics:** 1st in 2017 & 3rd in 2019 Inter-College Badminton Championships