HEMAN

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Summary

Robotics Engineer specializing in AI and Perception with strong skills in software development, robotics simulation, and mechanical design. Passionate about advancing innovations in robotics.

Education

University of California, Riverside Sept 2023-Present

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, AutoCAD, Autodesk Fusion, Catia, Creo, Ansys, Sofa.
- **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++, Java, 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- Present

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**.

Moog Advance Systems Pvt. Ltd., Gurguram, India Mar 2022 - Nov 2022

Mechanical Design Engineer (Research and Development Department)

- Designed components for armored vehicles, steering assemblies, and military weapons, ensuring compliance with rigorous specifications. Created detailed production drawings using AutoCAD and SolidWorks.

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

Sensor Development (Inprogress-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

- Established and equipped a robotics laboratory under Professor Mingyu Cai's guidance to support advanced research in robotics and automation.

- 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.

Fabrication of FDM 3D Printer (Maharshi Dayanand University, India *Guidance: Dr. Deepak Chhabra*)

- Optimized thermoplastic filament production by blending materials with additives and nanofibers for enhanced mechanical properties, applying precise process parameters for efficiency.

Extracurricular Activities

Maharshi Dayanand University, Rohtak

- Secured 1st position in Hackathon organized by CipherSchools on 9th August 2020.
- Secured 2nd position in a science competition organized by the Department of Environment of Science.
- Secured 1st position in 2017 and 3rd position in 2019 in the inter-college badminton championships.