Venkata Sai Sricharan Kasturi

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EDUCATION

University of Maryland, College Park, Maryland. **January 2023 - Present**

Master of Engineering in Robotics | **CGPA – 3.6**

- Relevant Coursework: Perception for Autonomous Robots, Planning for Autonomous Robots, Controls for Robotics, Robot Modeling, Deep learning & Introduction to AI, Robot learning, Industrial AI, Autonomous Robotics.

Guru Nanak Institutions Technical Campus, Hyderabad, India **June 2018 - June 2022**

Bachelor of Technology in Mechanical Engineering | **CGPA – 3.5**

- Relevant Coursework: Engineering Mechanics, Instrumentation & Control Systems, Computer Aided Designing and Manufacturing, Kinematics and Dynamics of Machines, Operations Research, Fundamentals of Artificial Intelligence, Python Programming, Data Base Management, Industrial Management, Production Planning and Control, Industrial Robotics.

PROFESSIONAL EXPERIENCE

Design Intern – South Central Railway, India **April 2021 – July 2021**

- Design Intern at South Central Railway, focused on designing and analyzing engine parts, wheels, body structures, and brake systems using SolidWorks, Simulia, and Ansys. Contributed to improving railway component performance and efficiency through design innovation and analysis.

Perception Intern – XMACHINES **May 2022 – December 2022**

- Perception Intern at XMachines, focused on computer vision, machine learning, and AI for projects in agriculture, automation, solar management, and robotics. Utilized sensors and advanced techniques to enhance perception for AI-based systems, contributing to successful real-world applications.

TECHNICAL SKILLS and CERTIFICATIONS

- **Programming & Scripting languages:** C++, Python, Shell/Bash, MATLAB, HTML
- **Tools and Technologies:** SolidWorks, Ansys.
- **Frameworks:** Linux, ROS1, ROS2, Gazebo, Rviz, LabVIEW, Webots.
- **Libraries:** Pandas, NumPy, Matplotlib, OpenCV, Keras, TensorFlow, pyTorch
- **Certifications:** Aerial Robotics (Coursera-UPenn), A deep understanding of deep learning (Udemy)
- **Soft skills**: Product Management, Leadership skills, Communication Skills, Leadership, Motivated, Disciplined, and Adaptable.
- **Other Technical skills:** Hardware Debugging, System Diagnostics, Troubleshooting, End-to-End QA, Embedded Systems Debugging.

ACADEMIC PROJECTS

Autonomous Mobile Robot for Real-Time Obstacle Detection and Recognition

- Led a collaborative project to design and implement an autonomous 4-wheeled robot capable of real-time obstacle detection and recognition in indoor environments. Utilized the state-of-the-art YOLO (You Only Look Once) algorithm for precise object identification, integrating custom datasets using Roboflow with diverse indoor objects. The project involved the creation of a comprehensive dataset, model training and evaluation on cloud platforms, and hardware implementation using a Raspberry Pi camera and differential drive system for seamless navigation and obstacle avoidance. Achieved robust performance in real-time applications, showcasing advancements in robotics, surveillance, and autonomous systems.

Bearing Fault Diagnosis Using ML

- Optimized Utilized advanced machine learning techniques to enhance predictive maintenance strategies for rotary machinery. Diagnosed bearing faults, including roller, inner-race, and outer-race defects, by analyzing vibration data. Developed classification models—SVM, Random Forest, Self-Organizing Maps (SOM), and K-Nearest Neighbors (K-NN)—with a focus on feature extraction and selection. Achieved 100% classification accuracy through model optimization and 5-fold cross-validation. This project highlighted the potential of machine learning in automating fault detection and optimizing maintenance in industrial settings.

Development of an Autonomous Robot

- Designed and simulated a mobile manipulator robot, integrating mobility and manipulation to tackle complex industrial tasks in a simulated Mars environment. Developed an autonomous robot capable of navigating and performing operations like locating and transporting construction blocks, using a mobile platform with motors, wheels, a Raspberry Pi, camera, sonar sensors, and a servo gripper. Created control algorithms based on kinematic models, enabling autonomous navigation with path planning, object detection, and obstacle avoidance. Focused on optimizing task execution speed, sensor calibration, and intelligent motion control.

Mobile Manipulator Robot Design and Simulation Project

- Designed and simulated a highly functional mobile manipulator robot, integrating mobility and manipulation capabilities for complex industrial tasks. Tailored for industrial maintenance, the robot performed precise operations such as tightening bolts and inspecting machinery. Developed a robust mobility base with a four-wheel differential drive system and LIDAR sensors for accurate navigation. The manipulator arm featured a six-revolute joint design for 6-DoF configuration, enhancing flexibility, while an adaptable end-effector enabled diverse task execution. Integrated components using ROS and conducted simulation testing in Gazebo for design evaluation and iterative refinement of functionality, reliability, and efficiency.

ACHIEVEMENTS AND PARTICIPATIONS

- Runner up in the Inter College Robotics Competition (Pick and Place) called Robout-2k19.
- Finalist of Aliens Tech-Robo Competition (ATRC) and participated in various “Roboveda” competitions (Robo soccer, Robo Sumo, Tug of war, Drone) conducted by Sreenidhi University and Birla Institute of Technical Sciences
- Served as President of the Team Roboccon, demonstrating strong leadership.