Venkata Sai Sricharan Kasturi

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EDUCATION

University of Maryland, College Park, MD   January 2023 – December 2024
Master of Engineering in Robotics   GPA: 3.53/4.0
Guru Nanak Institutions Technical Campus, Hyderabad, India   July 2018 – July 2022
Bachelor of Technology in Mechanical Engineering   GPA: 8.35/10

SKILLS

Programming Languages: Python, C++, CUDA, Bash, HTML/CSS, MATLAB
Development & Platforms: Git, GitHub, Linux, Docker, CI/CD, Jupyter Notebook, Raspberry Pi, Arduino IDE
Robotics & Control: ROS1/ROS2 (MoveIt, RViz, Gazebo, URDF), SLAM, PID, Kalman Filtering, CARLA
Frameworks & Libraries: PyTorch, TensorFlow, Keras, OpenCV, scikit-learn, NumPy, pandas, Matplotlib, Eigen
CAD & Simulation: SolidWorks, MATLAB/Simulink, ANSYS, AutoCAD
Sensor & Embedded Systems: LIDAR, Depth Cameras, IMU, Encoders, Ultrasonic Sensors

WORK EXPERIENCE

Perception Intern   Hyderabad, India
XMachines   *May 2023 – December 2023*
- Collected and processed data from LIDAR, stereo cameras, and proximity sensors, increasing AI-based robot accuracy by 20% and reducing solar power plant inspection time by 30% through advanced computer vision and AI deployment.

PROJECTS

DQN-Based Autonomous Navigation System | **PyTorch, CNN, DQN, Reinforcement Learning, Gazebo, ROS2**
- Developed a DQN-based autonomous navigation framework in ROS2 and Gazebo, reducing collisions by 25% and improving navigation success by 20% using prioritized experience replay and dueling networks.
- Optimized trajectory planning with RGB and LIDAR inputs, achieving 90% success in 100+ simulations, while fine-tuning rewards to accelerate convergence by 15% and improve trajectory adherence by 10%.

Improved Bi-directional RRT* for Robot Path Planning | **TurtleBot3, Gazebo, Sensor Fusion, ROS2, Matplotlib**
- Engineered and optimized the Double-Tree RRT* algorithm, reducing computation time by 62%, path length by 35%, and achieving 30% faster convergence in ROS2 simulations for efficient path planning in complex environments.
- Integrated SLAM with LIDAR to generate occupancy grid maps at 95% accuracy, enabling precise localization and obstacle avoidance, achieving 98% navigation success on a TurtleBot3 and reducing path-planning failures by 40%.

Machine Vision-Based Obstacle Recognition Autonomous Navigation | **SLAM, YOLOv8, OpenCV, Embedded Control**
- Led a team to develop an autonomous differential-drive robot with real-time pick-and-place, achieving 92% detection accuracy using YOLOv8 and 98% odometry reliability with closed-loop control.
- Integrated multi-sensor fusion with SLAM, improving navigation precision by 30% and path-following accuracy by 92%, while optimizing Raspberry Pi multi-threading to cut execution time by 25% and keep sensor latency under 50 ms.

Mobile Manipulator Robot Design & Control | **ROS2, SolidWorks, UR10, LIDAR, URDF, Kinematics, Gazebo**
- Designed a 6-DOF mobile manipulator with a UR10 arm and differential drive, enhancing load stability by 20% and achieving 98% pick-and-place accuracy (± 1 mm) using Jacobian-based trajectory planning.
- Developed ROS2-based navigation with LIDAR fusion for real-time control (20 ms latency) in Gazebo, and improved end-effector performance with a vacuum gripper, boosting grasp reliability by 25% and motion stability by 30%.

LQR and LQG Controllers for Dual-Load Crane System | **MATLAB, System Modeling, Lyapunov Stability**
- Developed LQR and LQG controllers for a dual-suspended load crane in MATLAB, reducing oscillations by 30% and improving response time by 25% using Lyapunov stability analysis, ensuring robustness under 10% input disturbances.
- Conducted 100+ simulations on linear and nonlinear models, using Kalman filtering for 98% trajectory tracking under $\pm 15°$ displacements and 15% load variations, while designing state-space models with Euler–Lagrange dynamics for precise control under varying conditions.

ACTIVITIES

Robotics President   Hyderabad, India
Team Roboccon, Guru Nanak Institutions Technical Campus   *2020 – 2022*
- Runner-up in the Inter-College Robotics Competition "Robout-2k19" (Pick and Place) and finalist in Aliens Tech-Robo Competition (ATRC); participated in Roboveda events like Robo Soccer, Robo Sumo, and Drone competitions, while leading Team Roboccon as President, mentoring 50+ students in robotics projects.

CERTIFICATIONS

A Deep Understanding of Deep Learning – Udemy   *October 2024*
Aerial Robotics – Coursera/UPenn   *June 2023*