SUHAS NAGARAJ

- +1 (240) 351 4693
- www.suhasnagaraj.com
- suhas99@umd.edu

EDUCATION

Master of Engineering in Robotics [CGPA: 4.0 / 4.0] **Expected Graduation: May 2025**
University Of Maryland, College Park College Park, United States

Bachelor of Engineering in Mechanical Engineering [CGPA: 9.30 / 10] **August 2017 - July 2021**
Ramaiah Institute of Technology Bengaluru, India

PROFESSIONAL EXPERIENCE

Research Intern **May 2024 – August 2024**
Intelligent Inclusive Interaction Design (I3D) Lab, Indian Institute of Science (IISc) Bengaluru, India

- Conducted research under the guidance of Prof. Pradipta Biswas from the Department of Design and Manufacturing (DM) and the Robert Bosch Centre for Cyber Physical Systems (RBCCPS).
- Developed a novel SLAM algorithm integrating LIDAR sensors with 3D Gaussian Splatting and ROS2 for enhanced autonomous navigation and mapping.

Engineering Intern **October 2022 – March 2023**
DiFACTO Robotics and Automation Bengaluru, India

- Excelled in designing automation parts using SolidWorks and conducting industrial process simulations with FANUC RoboGuide.
- Gained proficiency in offline and online programming of industrial robots (ABB and FANUC).
- Developed skills in PLC programming and Devicenet interfacing to effectively control ABB and FANUC robot cells using Mitsubishi PLC.

Technical Consultant **August 2021 – March 2022**
U-Solar Clean Energy Solutions Pvt. Ltd. Bengaluru, India

- Managed clients and accelerated sales as part of the inaugural team of Technical Consultants; spearheaded market and policy research initiatives to boost brand visibility while devising strategies for business expansion.
- Contributed as a vital team member to a 25% increase in leads and projects in the pipeline.

SKILLS

- **Technical Expertise:** ROS1/ROS2, Industrial Robot Programming (ABB, FANUC), Control Systems, Path Planning, SLAM, Computer Vision, 3D Reconstruction, Machine Learning, Deep Learning, Natural Language Processing.
- **Programming Languages:** Python, C++, MATLAB, RAPID (ABB), KAREL (FANUC), PLC Programming.
- **Libraries/Frameworks:** TensorFlow, PyTorch, OpenCV, Open3D, NumPy, pandas, scikit-learn.
- **Industrial Robotics:** FANUC ROBOGUIDE, ABB Robot Studio, CimStation Robotics.
- **Design & Simulation Tools:** SolidWorks, AutoCAD, Fusion 360, CATIA, Simulink.
- **Hardware:** RMRC Anaconda, Turtlebot3, Tortoisebot, Tankbot, Fanuc R-2000iC/210L, ABB IRB 1600.
- **Others:** Docker, Linux, GitHub, MS Office.

PROJECTS [www.suhasnagaraj.com/projects]

- Obstacle avoidance and autonomous navigation of TurtleBot using Deep Q-Network (Deep Reinforcement Learning).
- Stop Sign detection, trial/waypoint following, dynamic obstacle avoidance on a real TurtleBot3 waffle.
- Maze navigation by reading aruco markers, object recognition using camera and spatial localization by tf transforms on Gazebo using TurtleBot (C++ and ROS2).
- Mapping of an unknown environment (SLAM) and autonomous navigation of TurtleBot on Gazebo (C++ and ROS2).
- Inverse Kinematics and Machine Tending Simulation of ABB IRB 1600 on Gazebo using ROS2.
- Implemented Dijkstra's, A*, Real Time RRT*, Bidirectional A* and Potential Field Algorithm for Robot Path Planning.
- Simulation of Feedback Linearization and Sliding mode control of Quadcopter using MATLAB Simulink
- Using RNN and LSTM models to forecast the future trends of Airline Passengers on PyTorch and comparing the accuracy.
- Camera Calibration; Depth and disparity estimation using stereo vision.
- Using Homography and Perspective transform for image stitching.
- LQR and LQG control of a dual pendulum suspended cart.

PUBLICATION

3D Reconstruction via Camera-Lidar (2D) Fusion for Mobile Robots: A Gaussian Splatting Approach
*Ajay Kumar Sandula, *Shriram Damodaran, *Suhas Nagaraj, Debasish Ghose and Pradipta Biswas*
Submitted to IEEE International Conference on Robotics and Automation (ICRA) 2025, under review.
** are equally contributing authors*