SUHAS NAGARAJ

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PROFESSIONAL SUMMARY

I am a dedicated and passionate Robotics Engineer currently pursuing a Master of Engineering in Robotics at the University of Maryland, College Park, where I have achieved a perfect CGPA of 4.0/4.0. With a solid foundation in Mechanical Engineering from Ramaiah Institute of Technology, I bring a commitment to excellence and continuous learning. As a proud member of the Phi Kappa Phi Honor Society, my primary interests lie in Robotics, Deep Learning, Computer Vision, and Natural Language Processing, areas in which I have both academic and practical experience. Currently, as a Research Intern at the Indian Institute of Science (IISc), I am actively integrating cutting-edge technologies in robotics and AI.

EDUCATION

University Of Maryland, College Park — **College Park, United States**

Master of Engineering – Robotics, Current CGPA: 4.0 / 4.0 — August 2023 – Present

Relevant courses: Control Systems, Robot Programming, Robot Modelling, Robot Learning (Deep Reinforcement Learning), Perception, Path Planning, Software Development*, Natural Language Processing*, Deep Learning Fundamentals*

Ramaiah Institute of Technology — **Bengaluru, India**

Bachelor of Engineering, Mechanical Engineering, CGPA: 9.30 / 10 — August 2017-July 2021

Relevant courses: Robotics, Vibrations, Control Systems, Linear Algebra, C Programming, Mechanics, Dynamics, CAD/CAM, Kinematics, Manufacturing, Machine Design, Operations Research, Finite Element Analysis, Non-Traditional Machining

PROFESSIONAL EXPERIENCE

Intelligent Inclusive Interaction Design (I3D) Lab, Indian Institute of Science (IISc) — **Bengaluru, India**

Research Intern — June 2024 – Present

- Working as Research Intern at I3D Lab under the guidance of Prof. Pradipta Biswas (Department of Design and Manufacturing and Robert Bosch Centre for Cyber Physical Systems)
- Integrated advanced sensors into autonomous systems.
- Implemented and modified state-of-the-art SLAM algorithms
- Participated in the Bengaluru Mobility Challenge Hackathon and developed a vehicle counting script using object tracking and optical flow.
- Conducted Gaussian splatting and 3D reconstruction for enhanced perception and mapping.
- Designed and prototyped sensor mounts, utilizing 3D printing technology for rapid iteration and testing.

DiFACTO Robotics and Automation — **Bengaluru, India**

Trainee / Engineering Intern — October 2022 – March 2023

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

U-Solar Clean Energy Solutions Pvt. Ltd. — **Bengaluru, India**

Technical Consultant — August 2021 – March 2022

- Administered as the Technical Consultant, managed clients and accelerated sales.
- Spearheaded market and policy research initiatives to stimulate brand visibility while devising strategies for expanding the business.

* Indicates ongoing coursework

SKILLS

Technical Expertise: Computer Vision, Path Planning, Machine Learning, Deep Learning and Neural Networks, SLAM, 3D Reconstruction, Software Development, Industrial Robot Programming, PLC programming, Control systems, Modelling, Design, Prototyping.
Programming Languages: Python, C++, MATLAB, RAPID (ABB), KAREL (FANUC), PLC Programming
Libraries: ROS2, ROS, NumPy, pandas, PyTorch, Tensorflow, OpenCV, Open3d, scikit-learn
Industrial Robotics: FANUC ROBOGUIDE, ABB Robot Studio, CimStation Robotics
Design and Simulation Tools: Simulink, SolidWorks, Fusion, AutoCAD, CATIA
Others: Docker, Linux, GitHub, MS Office

PROJECTS

- Edhitha Unmanned Aerial Systems: Selected to participate in AUVSI SUAS competition in Maryland, USA; Collaborated in creating advanced Unmanned Aerial Systems capable of autonomous tasks; Secured 10th rank internationally in the 2017-18 edition of the competition.
- Inverse Kinematics and Machine Tending Simulation of ABB IRB 1600 on Gazebo using ROS2
- Simulation of Feedback Linearization and Sliding mode control of Quadcopter using MATLAB Simulink
- LQR and LQG control of a dual pendulum suspended cart.
- 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)
- Using RNN and LSTM models to forecast the future trends of Airline Passengers on PyTorch and comparing the accuracy.
- Implemented Dijkstra's, A*, Bidirectional A*, Potential Field Algorithm for Path Planning
- Real Time RRT* Algorithm for real time path planning
- Object tracking in a video based on its color, fitting & plotting its trajectory using OpenCV.
- Camera Calibration; Depth and disparity estimation using stereo vision.
- Using Homography and Perspective transform for image stitching.
- Stop Sign detection, trial/waypoint following, dynamic obstacle avoidance on a real TurtleBot3 waffle.
- Obstacle avoidance and autonomous navigation of TurtleBot using Deep Q-Network (Deep Reinforcement Learning)
- Motion planning for Panda robot using Moveit and ROS2
