Bhavana Rao

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EDUCATION

University of Maryland – College Park — College Park, MD
Master of Engineering, Robotics, GPA: 4.0/4.0 — Expected May 2025
Relevant Coursework: Control Theory, Robot Modeling, Planning, Perception, Autonomous Robots

Ramaiah Institute of Technology — Bengaluru, India
Bachelor of Engineering, Electronics & Communication, GPA: 9.56/10 — Jul 2019 - Jul 2023

SKILLS

Programming: Python, C, C++, MATLAB, Arduino IDE, Raspberry Pi
Frameworks & Tools: ROS, Gazebo, OpenCV, NumPy, PyTorch, TensorFlow, Pandas, Keras, Git, LLM (Large Language Models), Generative AI, Scikit-learn
Engineering: SolidWorks, Fusion 360, PCB Design, LabVIEW, Cadence Virtuoso
Certifications: Structuring Machine Learning Projects by DeepLearning.AI (Coursera)

WORK EXPERIENCE

Maryland Robotics Center — College Park, MD
Research Assistant — Jan 2024 – Present
- Tracked fish trajectories using YOLOv8 and segmentation to analyze behavior patterns, significantly reducing manual analysis time by 50%.

Indian Institute of Science (IISc) — Bengaluru, India
Research Intern, Coordinated Robotics Lab — Sep 2022 – Mar 2023
- Reduced data transmission latency by 40% by implementing TCP/IP communication protocols for bidirectional communication between the central server and multiple 3pi+ robots.
- Optimized intersection management, increasing traffic flow efficiency by 20% utilizing reinforcement learning.

PROJECTS

Customer Review Classifier System for a Restaurant | Python, OpenAI LLM — Jun 2024
- Created a customer review classifier system using OpenAI's Large Language Models, achieving 95% accuracy in sentiment analysis and topic modeling, processing over 10,000 reviews to enhance customer feedback analysis and restaurant performance evaluation.

Implementation of MOD-RRT* | Python, Pygame — May 2024
- Implemented the multi-objective dynamic RRT* algorithm for a TurtleBot to navigate maps with static and dynamic obstacles with an execution time of 25s.

Realtime Semantic Segmentation| TensorFlow, Matplotlib, Pandas, NumPy — May 2024
- Focused on creating a real-time semantic segmentation for autonomous vehicles using FPN, UNET, and custom UNET models on the CamVid dataset, achieving 97% accuracy and 0.2 loss.

Autonomous Navigation and Perception Robot | Python, Raspberry Pi — May 2024
- Built a 4-wheeled robot with a gripper and integrated camera, IMU, ultrasonic sensor, and motor controller, achieving precise navigation of a 10x10 ft map with obstacles to pick and place 9 objects in a specific order.

Sliding Mode Control based on backstepping for UAV | MATLAB, SciPy, Python — Dec 2023
- Developed a sliding mode controller to improve trajectory tracking, optimized with BFGS Algorithm, reducing error to under 1%.

Design of LQR and LQG controller for an inverted dual-pendulum crane | MATLAB — Dec 2023
- Analyzed and controlled the dynamics of an inverted dual-pendulum crane, encompassing system definition, linearization, and the design of LQR and LQG controllers. Evaluated controllability and observability aspects, resulting in a 15% increase in system stability and a 20% decrease in response time.

PUBLICATIONS

- **Analysis of a zipliner robotic system to assist astronauts, International Astronautical Conference**, Paris, 2022.
- **An Overview of Determining Fish Population Using Image and Acoustic Approaches**, IEEE, 2022.
- **Computer Vision for Space Exploration**, International Journal of Engineering Research & Technology, 2020.