

Sai Rohit Murali

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EDUCATION

University of Illinois at Urbana-Champaign | Urbana-Champaign, IL

August 2024-May 2026

Master of Engineering in Autonomy and Robotics, GPA 3.70/4.0

Relevant Coursework: Autonomous Vehicle Systems, Safe Autonomy, Computer Vision, Machine Learning

Vellore Institute of Technology | Chennai, India

August 2019-June 2023

Bachelor of Technology in Mechanical Engineering, GPA 8.4/10.0

PROFESSIONAL EXPERIENCE

Rivian | Normal, IL | *Robotics Integration Intern*

May 2025-December 2025

- Built a FANUC robot communication gateway for **remote diagnostics**, with robot-side KAREL programs streaming controller state over TCP sockets to **asynchronous Python middleware** and authenticated HTTPS APIs
- Built an **OT-IT middleware** service enabling secure communication with production FANUC robots over **HTTP, FTP, and TCP**, retrieving robot programs, safety files, and backups while preserving factory-network isolation
- Developed **RoboAlert**, a production **fleet monitoring** service that queried FANUC controller alarms, detected critical servo/system faults, and alerted engineers to support **failure triage**
- Built automated validation tools for **FANUC robot programs** and **DCS safety configurations**, detecting program, weld-data, speed-limit, and restricted-zone errors and reducing validation time by **98%** across a **1,000+** robot fleet
- Architected and owned **8** production systems across **1,000+** FANUC robots for monitoring, validation, backup, integration

Capestart | Chennai, India | *Associate Machine Learning Engineer*

November 2023-May 2024

- Improved data extraction from **10K+** medical records with **LangChain**, **Kor**, and **GPT-4**, increasing accuracy from **71%** to **85%**
- Designed a summarization pipeline for medical articles with **RAG**, **GPT-4**, **LlamaIndex**, and **FAISS**, achieving **84.14%** accuracy

TEACHING & RESEARCH EXPERIENCE

CS588 – Autonomous Vehicle Systems | Champaign, IL | *Graduate Course Assistant*

January 2026-Present

- Mentoring **60+** graduate students across the AV stack: state estimation (**Kalman filtering**, **GNSS/GPS/IMU/LiDAR fusion**, **probabilistic localization**), perception (**BEV**, **CenterPoint**, **Faster R-CNN**), and multi-sensor calibration

Parasol Lab | Champaign, IL | *Graduate Research Assistant*

January 2026-Present

- Built a **closed-loop ROS2** manipulation stack on a physical **UR5** robot, integrating RGB-D sensing, Contact-GraspNet, SAM3, ZMQ middleware, coordinate transforms, and robot execution for grasping in unstructured scenes
- Researching scalable multi-robot TAMP algorithms with **Prof. Nancy Amato**, focusing on distributed large-scale planning

University of Winnipeg | Winnipeg, MB | *Mitacs Globalink Research Intern*

May 2022-September 2022

- Built bulk download server for plant datasets with **C++/wxWidgets GUI**, integrating EAGL-I data into Dryad repository
- Analyzed power laws to predict model accuracy without full training; presented at the **17th Annual Randy Kobes Symposium**

PROJECT EXPERIENCE (SELECTED)

Autonomous Drone Racing | *UIUC*

[\(GITHUB\)](#)

- Designed and tuned a **real-time** autonomous flight controller combining **MPC**, **dual-PID control**, cubic-spline trajectory generation, and geometric path tracking, achieving **98.39%** gate passage across **4+** environments
- Deployed a **30–50 Hz** onboard depth-based perception and tracking pipeline under real-time compute constraints, maintaining **0.05 m** tracking accuracy through **online recalibration**

Autonomous Vehicle Simulation Development | *UIUC*

[\(GITHUB\)](#)

- Built a **Gazebo simulation** of an autonomous vehicle using **URDF vehicle and sensor models**, enabling testing of autonomy software in configurable virtual environments
- Built a **YAML-driven** parameterization layer for **Gazebo** enabling declarative environment-map configuration with schema-driven obstacle and agent behaviors across **4+** environments for edge-case AV testing

Monocular Ego-Motion & Pose Estimation | *UIUC*

[\(GITHUB\)](#)

- Modeled ego-vehicle **3D motion** by fusing optical flow (Farneback), monocular depth (Depth Anything), and **YOLOv8** road segmentation to disentangle ego-motion from dynamic agents across a **6-camera nuScenes** sensor suite

TECHNICAL SKILLS

Languages: C++, C, Python, Embedded C, Bash, MATLAB, SQL

Robotics & Autonomy: ROS1/ROS2, ZMQ, MPC, PID Control, Sensor Fusion, Motion Planning, IMU, GNSS, Kalman Filtering

Simulation: CARLA, AirSim, Gazebo, Isaac Sim, RViz, Omniverse

Perception & AI: OpenCV, Open3D, SLAM, YOLOv8, SAM3, Optical Flow, Segmentation, Object Detection, PyTorch, TensorFlow

Tools & Systems: Docker, CMake, Bazel, Linux, FastAPI, Git, Terraform, AWS, LangGraph, Networking Protocols