Sai Rohit Murali

Champaign, IL | 919-867-8041 | srm17@illinois.edu | rohitmurali18.github.io | linkedin.com/in/sai-rohit-murali

EDUCATION

University of Illinois at Urbana-Champaign | Urbana-Champaign, IL   August 2024-May 2026
Master of Engineering in Autonomy and Robotics, GPA 3.66/4.0
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 Intern*   May 2025-December 2025
- Deployed **8** production automation systems for **1000+** Fanuc robot fleet using **Docker, AWS, and Terraform**, eliminating manual workflows and enabling centralized cloud control
- Reduced validation time by **98%** with automated OLP validators and DCS safety analyzers, preventing production faults
- Deployed OT-cloud platform (n8n, Ollama, Slack bots), cutting robot operations from **20 min** to **seconds** for all factory staff
- Optimized fleet backup system via job aggregation redesign, achieving **96%** cost reduction (**$14K/year**) with full coverage
- Architected a **foundation model-powered** multimodal inference platform (**AWS Bedrock, Claude 3.5**) unifying telemetry, compliance, and documents into a context-aware AI decision support system for **1000+ robots**

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 building **end-to-end AV stacks** spanning multi-sensor calibration, LiDAR mapping, perception/tracking, motion planning, and BEV forecasting

Parasol Lab | Champaign, IL | *Graduate Research Assistant*   January 2026-Present
- Researching scalable multi-robot TAMP algorithms with **Prof. Nancy Amato**, focusing on distributed large-scale planning
- Developed **vision-based RGB-D** pipeline to enable keypoint-free TAMP across unstructured, real-world environments

University of Winnipeg | Winnipeg, MB | *Mitacs Globalink Research Intern*   May 2022-September 2022
- Built bulk download server for plant datasets with **wxWidgets GUI**, integrating EAGL-I data into Dryad public 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)*
- Engineered a real-time autonomous drone racing system integrating an **OpenCV + depth-masking** perception pipeline with **pinhole camera localization** and adaptive in-flight gate recalibration to eliminate **positional drift**
- Designed a **hybrid MPC + dual-PID controller** with cubic spline planning and **30–50 Hz** sensor fusion, achieving **98.39%** gate passage and **0.05 m** position error across **4+** simulated environments

Autonomous Vehicle Simulation Development | *UIUC*   *(GITHUB)*
- Designed a **YAML-driven scenario** abstraction framework in Gazebo enabling declarative, **reproducible** simulation of static obstacles and dynamic social agents with configurable waypoint-based behavioral control
- Built a modular agent spawning and trajectory system to systematically **stress-test perception and tracking pipelines** under occlusion, multi-agent interaction, and dense-traffic edge cases

Vision Language Model for Autonomous Vehicles | *UIUC*   *(GITHUB)*
- Built a zero-shot monocular ego-motion estimation pipeline fusing optical flow (**Farneback**), **YOLOv8** road segmentation, and Depth Anything to reconstruct **3D vehicle motion** in world coordinates across a **6-camera nuScenes** sensor suite
- Integrated **SpatialBot** (3B VLM) with **SAM2** video segmentation and **Lucas-Kanade optical flow** to enable zero-shot spatial reasoning and dynamic object tracking across multi-camera sequential frames for autonomous driving perception

TECHNICAL SKILLS

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

Robotics & Autonomy: ROS1/ROS2, MPC, PID Control, Sensor Fusion, Motion Planning, Inverse Kinematics, Kalman Filtering

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

Perception & AI: OpenCV, Open3D, SLAM, YOLOv8, SAM2, Optical Flow, Segmentation, Object Detection, PyTorch, TensorFlow

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