

Sai Rohit Muralikrishnan

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EDUCATION

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

August 2024-December 2025

Masters in Autonomy and Robotics

Relevant Coursework: Principles of Safe Autonomy, Computer Vision, Robotics

Vellore Institute of Technology | Chennai, India

August 2019-June 2023

Bachelor of Technology in Mechanical Engineering

Affiliations and Certifications: IEEE Automation, VITEACH, Machine Learning at Atom Robotics; CSWA Certified

PROFESSIONAL EXPERIENCE

CapeStart | Chennai, India | Associate Software Engineer

November 2023-May 2024

- Utilized **LangChain**, **Kor**, and **GPT-4-32k LLM** model to optimize data collection elements for medical research articles in a GenAI-based systematic literature review tool, increasing accuracy from **71%** to **85%**.
- Designed a pipeline for generating single-article summaries of case reports and case series medical research articles using **RAG** and **GPT-4 turbo LLM model**, implemented with **LlamaIndex** and **FAISS index**, achieving an accuracy of **84.14%**.
- Collaborated with a research team to analyze medical research articles and summaries, identifying patterns and creating a prompt template to standardize single-article summary generation.

MMForgings | Chennai, India | Robotics Intern

August 2023-October 2023

- Engineered and deployed a machine vision system with FANUC robots for high-accuracy (**98%**) surface defect detection using **Canny Edge**, **Blob**, and **Contour Detection** algorithms.
- Programmed a FANUC robot (165–201 kg payload) using teach pendant programming to execute precise waypoint-based pick-and-place motions, controlling object pick-up using digital output signals.

RESEARCH EXPERIENCE

University of Winnipeg | Winnipeg, Canada | Mitacs Globalink Research Intern

May 2022-September 2022

- Optimized server portal for simultaneous plant dataset downloads by structuring data into organized folders, enhancing the GUI with **wxWidgets** for better user interaction; annotated and incorporated **EAGL-I** plant data into the **Dryad** dataset.
- Conducted power law analysis to estimate model accuracy without full dataset training; presented findings at the 17th Annual Randy Kobes Undergraduate Poster Symposium.

Vellore Institute of Technology | Chennai, India | Summer Research Intern

June 2021-August 2021

- Developed a lane detection system using **Hough transform**, **OpenCV**, and **Arduino** for speed calculation, achieving **96.3%** accuracy on straight roads and **90.4%** on curves. Embedded a voice assistant for real-time notifications and lane-keeping.
- Engineered speed sensor modules and an automatic alerting system to adjust vehicle speed based on lane conditions, enhancing safety and efficiency. Presented this system at **i-PACT'21**.[\[LINK\]](#)

PROJECT EXPERIENCE

Vision Language Model for Autonomous Vehicles | UIUC

October 2024-December 2024

- Architected a multi-camera pipeline integrating **SpatialBot** for scene understanding and depth estimation, enabling vehicle detection, motion direction analysis, and spatial reasoning in autonomous driving scenarios.
- Achieved efficient object tracking and ego-vehicle motion estimation by combining **YOLOv8**, **SAM2**, and optical flow, ensuring robust performance across diverse driving scenarios.[\[GITHUB\]](#)

Autonomous Drone Racing | UIUC

October 2024-December 2024

- Designed and implemented a hybrid control architecture in **AirSim**, integrating **MPC** for x-y planar motion and cascaded **PID** controllers for z-axis stabilization, achieving **98.39%** gate navigation accuracy across four diverse maps.
- Utilized **NanoSam** with a **keypoint** detector to identify and correct misaligned gates, achieving a positional prediction error of **0.05m** and dynamically recalibrating paths using spline interpolation for precise navigation.[\[GITHUB\]](#)

SketchUR3 | UIUC

November 2024-December 2024

- Orchestrated a robotic image reproduction pipeline with **OpenCV** for **contour detection** and **keypoint extraction**, integrated with **kinematics** in **ROS**, enabling precise trajectory planning and high-fidelity drawings on physical surfaces. [\[GITHUB\]](#)

Biomechanical Posture Enhancement System | Vellore Institute of Technology

November 2022-May 2023

- Developed a wearable assistive device for cervical impairments, integrating **NI-9236** and **MPU6050** sensors to optimize neck strain reduction, enhance real-time posture monitoring, and provide personalized rehabilitation support. [\[LINK\]](#)

SKILLS

Python, PyTorch, TensorFlow, C++, Git, Azure, OpenCV, Langchain, Llamaindex, Gazebo, ROS, Keras, Reinforcement learning

ACHIEVEMENTS

Outstanding Presentation Award at Riact'23, Finalist at Techgium'22, Awarded Mitacs Globalink Research Fellowship.