

Sahasrajit Anantharamakrishnan

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Full-Stack Robotics Engineer with expertise in hardware design, perception, planning, and control. Specializing in motion planning, classical, and learning-based control of mobile robots, manipulators, and legged systems. Skilled in C++, Python, CUDA, and ROS, with experience in GPU acceleration, real-time perception, and system integration.

EDUCATION

Northeastern University, Boston, MA

Master of Science in Robotics

May 2024

GPA: 3.939/4.000

Anna University, Chennai, India

Bachelor of Engineering in Electronics and Communication Engineering

May 2022

GPA: 8.66/10.00

SKILLS

Languages / Libraries	Python, C++, Drake, CUDA, C, PyTorch, JAX, Tensorflow, MATLAB & Simulink, OMPL
Software and Tools	ROS, Ubuntu Linux, Git, CMake, Docker, Gazebo, Nvidia Isaac Sim, PyBullet, MuJoCo, MQTT, Fusion 360, Blender, CI/CD, Automated Testing, gRPC, Protobuf
Proficient Concepts	Motion planning & Control, Trajectory Optimization, Kinematics & Dynamics Modeling, Deep Learning, Reinforcement Learning, Machine Learning, Computer Vision, State estimation/SLAM

WORK EXPERIENCE

Robotics and Intelligent Vehicles Research Laboratory (RIVeR), Boston, MA

June 2024 - Present

Robotics Research Assistant, **Project:** Stochastic Model Predictive Control for bipedal loco-manipulation

- Improved robustness against uncertainties in terrain and payload of Bipedal robot by adding soft-constraints to Model Predictive Control (MPC)
- Created novel simulation environments in NVIDIA Isaac Sim and PyBullet, for simulating, and testing the humanoid robot
- Improved the constraints and the dynamics model to guarantee stability

Northeastern Autonomy and Intelligence Laboratory (NAIL), Boston, MA

January 2023 - May 2024

Robotics Research Assistant, **Project:** High-Speed Off-Road Autonomy Robot

[Lab Link](#)

- Set up the lab from scratch, showcasing full-stack expertise in hardware, perception, planning, and control

Motion Planning and Control:

- Optimized the trajectory of AVs using a custom Model Predictive Path Integral (MPPI) algorithm, a costmap-based planner
- Formulated a custom cost function for the robot to account for kinematics & dynamic constraints, and terrain traversability
- Optimized algorithm runtime using GPU programming with CUDA C++ and JAX by 1000x

Perception:

- Fine-tuned, using PyTorch, a Vision Transformer AI model on a custom dataset to semantically segment rough terrain
- Increased training ease by 38% using SLURM and Docker to train, and run inference on GPU server cluster
- Created a custom data pipeline for 50,000 RGB images that included data collection, logging, storage and training
- Monitored model training progress and performance using TensorBoard and Weights and Biases (WandB)

Hardware:

- Fabricated a custom mobile robot using Fusion 360 to be used in high-speed off-road environments
- Engineered a custom electrical and network system of the robot to ensure safety and reliability

Rigbetal Labs LLP, Pune, India

August 2021 - November 2021

Robotics Engineer Intern

- Formulated a novel algorithm, Road Anomaly Detection System (RADS), in C++ to detect road anomalies
- Reduced cost by 90%, by generating a 3D Point cloud from a series of moving 2D Laser scans
- Developed a custom multi-agent path planning and mapping framework in AWS Robomaker and Gazebo
- Tested and Deployed the code using a custom CI/CD pipeline to ensure safe and reliable code

PUBLICATIONS

- [1] A. Trivedi, **S. Anantharamakrishnan**, S. Bazzi, and T. Padir. "Chance Constrained Convex-MPC for biPedal lOcomanipulation (C3PO)". [In Progress]. Mar. 2025.

PROJECTS

Implementing Batch Informed Trees (BIT*) Motion planning Algorithm for Robot Arms

March 2023 - April 2023

Paper: [Batch Informed Trees \(BIT*\): Informed asymptotically optimal anytime search](#)

[Project Link](#)

- Increased run-time efficiency of the algorithm by using hash-maps, parallelization and caching
- Engineered intuitive visualization and analysis tools to validate the algorithm
- Tested and validated the algorithm against baselines algorithms such as RRT, RRT*, FMT*, and RRT Connect