RAJ HARSHIT SRIRANGAM

srirangam.r@northeastern.edu ◇ Boston, MA ◇ (857) 421-9972 ◇ LinkedIn ◇ Portfolio

EDUCATION

Northeastern University, Boston, MA **Sep 2024 - Dec 2026**
Master of Science in Robotics with Concentration in Mechanical Engineering GPA: 4.00
Relevant Coursework: Robot Mechanics and Control, Robotics Sensing and Navigation, Mobile Robotics, Control Systems

National Institute of Technology Calicut, Kozhikode, India **Aug 2018 - Jun 2022**
Bachelor of Technology in Production Engineering GPA: 3.46
Thesis: Development of human safe, compliant end-effector for Nasopharyngeal swab testing
Relevant Coursework: Introduction to Robotics, Control Systems Engineering, Mechatronics and Automation

SKILLS

Languages	Python, Matlab, Bash, C++, Julia
Software	ROS, Linux, Git, Gazebo, Moveit, OpenCV, Solidworks, Ansys, Docker, numpy, Tensorflow, AWS, cvxpy, Isaac Lab, GTSAM
Hardware	Arduino, Nvidia Jetson, Raspberry Pi, Pneumatics, GPS, IMUs, Depth Cameras, LiDAR

EXPERIENCE

Silicon Synapse Lab, Northeastern University **Jan 2024 - Present**
Graduate Researcher

- Developed a multi-modal PRM algorithm for path planning for Husky Carbon, a quadrupedal robot capable of walking and aerial locomotion, leveraging Simscape Multibody to develop a simulation environment for validation
- Training Husky Carbon in Nvidia IsaacLab to generate multi-modal gaits using reinforcement learning policies (PPO, SAC) to traverse challenging environments using its legs and thrusters

Deloitte USI, Hyderabad, India **Jun 2022 - Aug 2024**
Analyst/Site Reliability Engineer

- Developed an automated monitoring, issue detection and resolution system for McDonald's Automated Drive-thru technology using NewRelic, PagerDuty and Rundeck resulting in a 98% uptime across over 100 stores
- Built proactive monitoring systems for AWS Infrastructure, Vehicle detection, Drive-thru AI and IoT smart kitchen with over 200 alert conditions and 23 resolution scripts, reducing issue resolution time by 80% and automating over 90% of incidents
- Automated monitoring report generation, analysis and release deployments saving over 150 hours/week of manual effort

PROJECTS

Metric-Semantic SLAM using Spot, Field Robotics Lab, Northeastern University **Dec 2024 – Present**

- Captured data from 5 stereo cameras, LiDAR, and odometry during indoor operation of Spot and generated detailed 3D point clouds using RTAB-Map and ROS
- Developing a pipeline for object-level metric-semantic SLAM based on SlideSLAM to identify and localize multiple objects in dynamic settings using Spot

Autonomous Swab Sampling Robot, NIT Calicut **Aug 2021 – May 2022**

- Implemented a control circuit for a Mitsubishi RV-M1 to perform nasal swab tests using ROS and Moveit on a Nvidia Jetson achieving a repeatability of ± 1.5 mm
- Designed and fabricated a 3 jaw compliant gripper with force feedback to detect when the swab hits the nasal walls and safely channel the swab through the nasal cavity using impedance control
- Trained an object detection model with a custom-made dataset with over 30,000 images from 47 people using yolov5 and ran it on an Xbox Kinect to detect the position of nostrils with an mAP of 86.9%

Additional Projects:
Arrow Throwing Robot, Obstacle-aware Manipulation, Acrobot Swing up control, Motion Planning using GCS

PATENTS

- An Autonomous Swab Sampling Robotic System and Method of Operating the Same - Application No.202441084732 A
- A Compliant Robotic End-Effector with Force Multiplication Mechanism for Efficient Object Manipulation - Application No.202441048455 A