Gaurav Kothamachu Harish

(+1) 857-339-9090 ◇ kothamachuharish.g@northeastern.edu ◇ linkedin.com/in/gauravkh ◇ gauravkh.co.in

EDUCATION

Northeastern University, Boston, MA - Master of Science in Robotics (Graduating: Apr 2026) GPA: 4.0/4.0
Courses: Deep Learning, Reinforcement Learning, Artificial Intelligence for Human-Computer Interaction, Mobile Robotics
Teaching Assistant for graduate-level Reinforcement Learning course with 109 students

Manipal Institute of Technology, India - Bachelor of Technology: Electronics & Communication GPA: 9.24/10
Courses: Computer Vision, Microcontrollers, Linux & Shell Scripting, Signal Processing

SKILLS

Programming: Python, C++, MATLAB, PWSH, Embedded C, Java, SQL, Shell Scripting
Technologies: Pytorch, Scikit-learn, Docker, Pandas, MoveIt2, openCV, Spring Boot, GTSAM, Gazebo
Tools: ROS1, ROS2, MuJoCo, MoveIt2, Cartographer, Rviz, Git, Jenkins, Kubernetes, OpenShift
Hardware: Sensor Fusion, Nvidia Jetson TX2, STM32, Atmega, Raspberry Pi, Arduino, Turtlebot

PROJECTS

Multi-Agent Trajectory Optimization Project

- Implemented a modular Bayesian optimization framework in Python for generating min snap trajectories considering dynamic feasibility, synchronized waypoints and obstacle avoidance for multiple drones
- Adapted single-drone multi-fidelity approach to a multi-drone approach, optimizing performance 98% dynamic feasibility

Advanced Elevation and Terrain Mapping for Navigation - Silicon Synapse Lab

- Engineered a scalable robotic navigation framework by integrating ANYbotics elevation mapping with TerraSense FPGA-accelerated terrain classification on ROS2 utilizing ANYbotics grid_map for its multi-layered data storage and efficient map re-positioning, and reducing incidents of robots getting stuck in unsuitable terrain by 49% compared to TerraSense
- Optimized the TerraSense neural network by implementing knowledge distillation techniques and parameter auto-tuning, reducing model size by 40% while maintaining classification performance, allowing deployment across robots

Electronics & AI Lead - Mars Rover Manipal

- Led a diverse cross-disciplinary team of 9 students in the URC 2020, achieving 7th place among 93 global teams
- Utilized RANSAC for ground plane extraction from a 3D LiDAR point cloud for obstacle detection and developed an autonomous navigation system on ROS for a Martian environment, fusing IMU and GPS via an extended Kalman filter
- Redesigned an embedded C program for rover wheel arm control and to communicate with the sensors and peripherals connected to STM32/Atmega, incorporating a hill assist feature and fail-safes for rover protection
- Negotiated sponsorship agreements with industry leaders SICK and Mouser, securing resources worth $6,000 for the team

Path Planning Using Reinforcement Learning

- Optimized DDPG algorithm for Path optimization on a 7-DoF Franka Emika Panda Robot manipulator, implementing prioritized experience replay and hyperparameter tuning using Whale Optimization, achieving 35% faster convergence
- Benchmarked against PPO, demonstrating DDPG's 25% better sample efficiency in Meta-World drawer-open tasks

WORK EXPERIENCE

Software Development Engineer II - Amadeus Software Labs Pvt Ltd, Bangalore, India Jan 2021 - Aug 2024

- Pioneered development of 50+ features for the Air Canada website (Java/MSSQL), with a focus on modular code and 100% test coverage resulting in zero production rollbacks
- Developed a patent-pending REST API technique reducing payload size by 62%, improving mobile load times by 1.8s
- Undertook initiatives to enhance Air Canada website's security and performance by fixing a zero-day gift card exploit, preventing million-dollar revenue loss, and resolving 4x CPU usage spikes, ensuring no downtime for 5M+ users

Control Systems Research Intern - Perma-Liner Industries Pte. Ltd June 2019 - August 2019

- Designed autonomous navigation protocols with RtabMap SLAM on ROS, creating highly detailed maps of tunnel/pipe environments to detect cracks and anomaly detection and achieving 95% localization accuracy
- Programmed STM32F103 microcontroller and Grove I2C motor drivers for precise motor control with high-speed encoders