Gaurav Kothamachu Harish

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EDUCATION

Northeastern University *September 2024 - Expected April 2026*
Master of Science in Robotics (Computer Science Concentration) 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: Assisted with projects and assignments

Manipal Institute of Technology, Manipal, India *July 2017 - July 2021*
Bachelor of Technology: Electronics & Communication Engineering GPA: 9.24/10
Courses: Computer Vision, Microcontrollers, Linux & Shell Scripting, Signal Processing Minor

PROJECTS

Northeastern University
Path Planning Using Reinforcement Learning and Neural Radiance Fields *September 2024 - December 2024*
- Implemented a DDPG algorithm in PyTorch, TorchRL that achieved 2x faster convergence by implementing Prioritized Experience Replay, a custom Dense Reward Structure and optimizing hyper-parameters using Whale Optimization Algorithm
- Engineered a data generation pipeline and a multi-view encoder architecture using PyTorch for semantic-aware Neural Radiance Fields (NeRF), processing RGB, semantic, and depth images for enhanced environmental mapping

Northeastern University
Multi-Agent Trajectory Optimization Project *September 2024 - December 2024*
- Implemented a modular Bayesian optimization framework in Python generating minimum snap trajectories for multiple drones
- Adapted single-drone multi-fidelity approach to a multi-drone approach, optimizing performance 98% dynamic feasibility

Mars Rover Manipal Faculty advisor: Prof.Navaneeth Krishna Vernekar
Electronics & AI Lead *May 2018 - August 2020*
- Negotiated sponsorship agreements with industry leaders SICK and Mouser, securing resources worth $6,000 for team projects
- Implemented obstacle avoidance and autonomous traversal for a open martian environment on ROS using a 3D SICK LiDAR, GPS and IMU sensors with no velocity or torque control
- Redesigned an integrated program for rover's wheel & arm control and to communicate with the sensors and peripherals connected to STM32 and Atmega for manual control and inverse kinematics
- Primary Operator for the team in URC 2019 teleoperating the rover and achieving 1st place among Asian teams, 8th worldwide

WORK EXPERIENCE

Amadeus Software Labs Pvt Ltd
SDE II, SDE I, SDE Intern *January 2021 - August 2024*
- Engineered an AI-powered chatbot using Azure AI Search and GPT-3.5 Turbo, trained on unstructured website data to deliver personalized error resolution suggestions based on user context, resulting in a 10% improvement in website conversion rates.
- Engineered an analytics solution leveraging Splunk and machine learning to alert on user behavior trends in Airline websites
- Developed 50+ eCommerce features for Air Canada using Angular and Java, delivering 4 major cutovers
- Containerized Spring Boot app and deployed on Azure cloud via OpenShift, auto-scaling reducing costs by 35%

Perma-Liner Industries Pte. Ltd
Control Systems Research Intern *June 2019 - August 2019*
- Engineered a robust mapping and localization system using Extended Kalman Filter (EKF) that fused IMU data with RGBD camera features, achieving 95% positioning accuracy in GPS-denied tunnel environments

ACHIEVEMENTS

- Pioneered 2 concepts currently under consideration for IP filing: A system to streamline family seat selection in air travel, and A method to optimize REST call data size, improving load times in low-bandwidth scenarios
- Recognized as a "Risk Taker" and "High Flyer" in the organization; received the prestigious "Torch Bearer" award twice in 3 years,the highest honor in the airlines unit of Amadeus Software Labs

SKILLS

Languages: Python, C++, Java, HTML, CSS, Typescript, Helm, SQL, MATLAB, Shell scripting, PWSH
Frameworks: LangChain, PyTorch, Scikit-learn, TensorFlow, Gazebo, MoveIt2, openCV, GTSAM, Spring Boot, Docker, AutoCAD, Bootstrap, Angular, Openshift, Podman, OpenCore
Other Technologies: Robotics Operating System, MuJoCo, Azure AI Search, Splunk, Dynatrace, Postman, Jenkins, Argos
Hardware: Nvidia Jetson TX2, STM32, Atmega, Raspberry Pi, Arduino