# Gaurav Kothamachu Harish

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Available May 2025 – December 2025

## Education

**Northeastern University, Boston, MA** - Master of Science in Computer Science (Graduating April 2026) **GPA: 4.0**
- Courses: Deep Learning, Reinforcement Learning, AI for Human-Computer Interaction
- Teaching Assistant for graduate-level Reinforcement Learning course

**Manipal Institute of Technology, India** - Bachelor of Technology: Electronics & Communication **GPA: 3.69**
- Courses: Computer Vision, Microcontrollers, Linux & Shell Scripting, Signal Processing Minor

## Skills

**Programming** Python, Java, Shell Scripting, MATLAB, PWSH, SQL, Docker, Typescript, HTML/CSS
**Technologies** Pytorch, Scikit-learn, TensorFlow, Langchain, LangGraph, Pandas, NumPy
**Tools** Ollama, OpenAI APIs, Azure AI Search, Splunk, MLOps, Dynatrace, Openshift, Git, Github, Kubernetes

## Projects

**Debate Training with LLMs and Multi-Agent Interaction Structures** gauravkh.co.in
- Constructed a multi-agent debate framework leveraging two distinct LLMs to simulate opposing arguments, utilizing LangGraph to construct a debating workflow that facilitates opposing argument enhancement via iterative feedback
- Incorporated human-in-the-loop with human preference through LLM-as-a-judge comparing BERTScore with OpenDebateEvidence knowledge base to build 40k golden samples

**Path Planning Using Reinforcement Learning and Neural Radiance Fields** github.com/khgaurav/RL_DDPG_Nerf
- Optimized DDPG algorithm for performing Path Planning on a 7-DoF Franka Emika Panda Robot manipulator, implementing prioritized experience replay and hyperparameters tuning using Whale Optimization, achieving 35% faster convergence
- Benchmarked against PPO, demonstrating DDPG's 25% better sample efficiency in Meta-World drawer-open tasks
- Shortened episode length by 33% by integrating NeRF-generated volumetric state space representation

**Monocular Depth Estimation**
- Designed a deep learning pipeline leveraging CNN and Transformer architectures to predict depth maps from single RGB images, achieving a 22% reduction in RMSE on NYU Depth v2 and KITTI datasets
- Optimized models for real-time deployment on edge devices by reducing computational complexity through input partitioning and lightweight architecture design

## Experience

**Software Development Engineer II,** Amadeus Software Labs Pvt Ltd - Bangalore, India Jan 2021 - Aug 2024
- Implemented an LLM powered chatbot using RAG and GPT-3.5 Turbo, trained on unstructured documentation to deliver personalized error resolution suggestions based on user context, resulting in a 10% increase in website conversion rates
- Engineered an analytics solution leveraging Splunk and machine learning to alert user behavior trends in Airline websites
- Developed a patent-pending REST API technique reducing payload size by 62%, improving mobile load times by 1.8s
- Migrated monolithic Spring Boot application to OpenShift on Azure, reducing cloud costs by 35% through autoscaling and scheduled deployment through Jenkins and secured changes using secrets and ConfigMaps
- 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
- Spearheaded development of 50+ features for the Air Canada website (Angular/Java/MSSQL), with a focus on modular code and 100% test coverage resulting in zero production rollbacks

**Electronics & AI Lead**, Mars Rover Manipal - youtu.be/V22SHOJQx4I Jan 2018 – Aug 2020
- Spearheaded a team of 9 students in the URC competition 2020, achieving 7th place out of 93 international teams
- Secured $6,000 in resources through sponsorship negotiations with SICK and Mouser, enhancing team capabilities
- Utilized RANSAC for ground plane extraction from LiDAR point cloud for obstacle detection and developed an autonomous navigation system using Python, filtering data from IMU and RTK GPS using an extended Kalman filter
- Redesigned an integrated C++ program for rover's wheel & arm control and to communicate with the sensors