Hemanth Sai Madadapu

+1 508-558-9914 | madadapu.h@northeastern.edu | linkedin.com/in/hemanth1403 | github.com/hemanth1403

Achievements

- **Commercially Licensed Patent** — AI-based Autonomous Farm Rover patent (No. 202341038965) licensed to **Hexaind Technologies for INR 500,000**, demonstrating market-ready innovation in agricultural robotics
- **5 Patents Filed** — Lead inventor on autonomous systems including **FOD detection, ADAS, and IoT vehicle safety systems** with Indian Patent Office
- **Defense Contract** — Led production deployment of edge AI system for **Indian Air Force Academy achieving 93% precision** in real-world conditions
- **International Publication** — Published research on IoT and ML-based robotics at **IEEE ICCCI 2024**, India

Education

- **Northeastern University** Boston, MA
  Master of Science in Artificial Intelligence; GPA: 3.4 *Jan. 2025 – May 2027*
  - Relevant Coursework: **Machine Learning Operations, Deep Learning, Machine Learning, Programming design paradigm, Natural Language Processing, Foundation of Artificial Intelligence, Algorithms**
- **IIIT Hyderabad** Hyderabad, India
  AI/ML Training Program - Certificate of Proficiency *Aug. 2023 – Apr. 2024*
  - Completed intensive 12-month program implementing **14 ML algorithms including SVMs, neural networks, deep learning architectures**
  - Built and deployed production ML pipelines with focus on **gradient descent optimization, probabilistic models, and transfer learning**

Work Experience

- **Indian Air Force Academy** Jan. 2024 – Dec. 2024
  Project Lead - AI/ML Engineering — Python, YOLOv8, NVIDIA Jetson, Edge AI, TensorRT *Hyderabad, India*
  - Designed and deployed real-time FOD detection system using **NVIDIA Jetson Xavier NX achieving 93% precision, 88.2% recall at 21 FPS** on edge hardware
  - Optimized YOLOv8 architecture through **hyperparameter tuning and TensorRT quantization**, **reducing false positives by 35% and inference latency by 40%**
  - Integrated autonomous EV platform with e-con cameras and developed **sensor fusion pipeline** for stable detection across varying environmental conditions
- **Scalenet** Mar. 2023 – Jun. 2023
  Machine Learning Intern — Python, AWS S3, MongoDB, Docker, Data Pipeline *Remote, USA*
  - Architected scalable data pipeline processing **10,000+ images using AWS S3 and MongoDB**, **reducing retrieval latency by 60%**
  - Implemented automated augmentation pipeline **increasing training dataset by 3x** while maintaining data quality through validation checks
- **H-Bots Robotics** Mar. 2022 – Jun. 2022
  Robotics Engineering Intern — Python, OpenCV, ROS, Raspberry Pi, Computer Vision *Hyderabad, India*
  - Developed real-time facial recognition system using **OpenCV and SVM**, achieving **15% accuracy improvement and 25% faster processing**
  - Integrated servo motors and IoT sensors with Raspberry Pi for autonomous human-robot interaction handling **30+ simultaneous detections**

Major Projects

- **Autonomous Agricultural Surveillance Robot** — CNN, Transfer Learning, ROS, Line Tracking, Cluster Mapping
  - Built autonomous navigation system using **line tracking algorithm and cluster-based field mapping** for complete farm coverage
  - Deployed dual-camera system (static + mechanical arm) with **CNN-based disease detection achieving 89% accuracy** across 5 crop types
  - Implemented predictive analytics for yield forecasting and integrated with agricultural test centers via GitHub API
- **Advanced Driver Assistance System (ADAS)** — GitHub — YOLOv8, OpenCV, TensorFlow, Edge AI
  - Engineered **6-component ADAS including drowsiness detection (92% accuracy), lane tracking, and collision warning** on edge hardware
  - Developed real-time object detection and **traffic density estimation using optical flow** for adaptive cruise control

Patents & Publications

- **Patents Filed (Indian Patent Office)**
  - **(Patent No. 202341038965 A)** Crop Monitoring with AI-based Autonomous Farm Rover - **Licensed to Hexaind Technologies**
  - **(Application No. 202341076488 A)** Driver Assistance System with Multi-Modal Sensing
  - **(Application No. 202341067751 A)** IoT-based Intelligent Vehicle Safety System
  - **(Application No. 202341067757 B)** IoT-Sensor-based Plant Disease Diagnosis
  - **(Application No. 202341067754 A)** Prediction of Birds and Analysis of Endangered Bird Species
- **Published Research**
  - J. Vijay Gopal, T.S. Subashini, **M. Hemanth Sai**, V. Abhinaya, M. Sai Krishna, S. Nagapreethi. *"Hello Humans! Welcome to RoboVerse: An IoT Based Interactive Robot"*. IEEE 13th International Conference on Computer Communication and Informatics (ICCCI), Coimbatore, India, Jan 29-31, 2024.

Technical Skills

Languages: Python, C++, SQL, JavaScript, TypeScript, Git/GitHub
Edge AI & Robotics: NVIDIA Jetson Xavier NX, TensorRT, ONNX, CUDA, ROS, Raspberry Pi, Arduino, Sensor Fusion
ML/AI Frameworks: PyTorch, TensorFlow, YOLOv8, Hugging Face, Transfer Learning, CNNs, SVMs, LLMs, Prompt Engineering
Computer Vision: Object Detection, Semantic Segmentation, Instance Segmentation, Image Classification, Real-time Processing
Cloud & MLOps: AWS (EC2, S3, SageMaker), Docker, Kubernetes, MongoDB, REST APIs, CI/CD, Model Optimization

Certifications

AWS Cloud Practitioner | **Python for ML (Great Learning)** | **AI-ML Training (IIIT)** | **SAE India AI-ML Level 1**