Sai Krishna Reddy Mareddy

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Education

University of North Carolina at Charlotte — Charlotte, NC

M.S. in Computer Engineering | GPA: 3.87/4.0 — *2023 – 2025*

- **Thesis:** Learning Deception and Counter-Deception Strategies in Adversarial Settings. Focused on advanced reinforcement learning techniques—including actor-critic methods and policy gradient frameworks—to design multi-agent strategies resilient to deceptive adversarial tactics.

JNTUH College of Engineering — Hyderabad, India

B.Tech in Electronics and Communication Engineering | GPA: 8.3/10.0 — *2019 – 2023*

Industrial Experience

Lowe's Companies

Machine Learning Researcher — *May 2024 – Dec 2024*

- Developed scalable MLOps pipelines for model deployment and monitoring.
- Researched multi-camera tracking and customer behavior analysis with potential applications in dynamic policy adaptation in retail environments.
- Explored innovative methods combining vision-based analytics with reinforcement learning concepts to enhance decision-making.

Honeywell

Embedded Software Engineer — *Feb 2023 – July 2023*

- Engineered an AI-powered robotic arm using Jetson Nano, featuring real-time gesture recognition and control strategies that incorporate reinforcement learning insights.
- Implemented a CNN-based text-to-speech system, improving clarity and naturalness.
- Automated system testing with Python scripts, reducing manual intervention by 67%.

The Sparks Foundation

Data Science Intern — *July 2020 – Aug 2022*

- Developed ensemble models (Random Forest, XGBoost) for fraud detection with data analytics techniques.
- Engineered ETL pipelines for effective data cleaning and ingestion from multi-source environments.

Academic Research Experience

Controls Optimization Autonomy and Robotics Lab — Charlotte, NC

Research Assistant — *Dec 2024 – Present*

- Developed advanced reinforcement learning models in adversarial settings, specifically addressing deceptive behavior among agents.
- Designed multi-agent RL simulations with dynamic obstacles and environmental uncertainties to evaluate emergent strategies.
- Integrated risk-sensitive exploration and actor-critic approaches to enhance policy robustness against deception.

University of North Carolina at Charlotte — Charlotte, NC

Research Assistant — *Jan 2024 – May 2024*

- Investigated multi-camera object tracking and activity analysis; incorporated reinforcement learning insights to refine model decision boundaries.
- Integrated models such as CLIP, Transformers, and LLMs for robust re-identification and tracking.
- Enhanced tracking accuracy using state-aware and spatio-temporal Re-ID models.

SPIRE Laboratory

Research Intern — *May 2022 – Dec 2022*

- Developed deep learning models for audio feature extraction and speaker classification.
- Processed large-scale audio datasets for real-time surveys and classification tasks.

Technical Skills

Languages: Python, C++, SQL, Scala, Rust, Bash, RISC-V
ML & RL Frameworks: PyTorch, TensorFlow, Keras, Scikit-learn, OpenAI Gym, Stable Baselines3
MLOps/Cloud: Docker, Kubeflow, MLflow, AWS SageMaker, DVC, Kubernetes, Airflow
Big Data: Spark, Hadoop, Kafka, Snowflake
Tools: OpenCV, FAISS, NumPy, Pandas, Grafana, PostgreSQL
Embedded Systems: MSP430, UART, I2C, RISC-V, RTOS, Linux Kernel

Awards & Certifications

Silver Medal - NeurIPS 2024 - Lux AI Season 3
Winner - BTL StarTech Challenge 2023
Verizon Merit Scholarship - IIT Madras
Top 0.1% Telangana State Merit Scholarship
MLOps Specialization (DeepLearning.AI), Advanced Python (CutShort), Python Data Structures (UMich)

Publications

"Estimating Vehicle Speed on Roadways Using RNNs and Transformers: A Video-based Approach" **[Link]**
"Wireless Charging Through Wi-Fi Router," IRJMETS, Nov 2022 **[Link]**
"Big Data Intrusion Detection Using Random Forest," IRJMETS, Nov 2022 **[Link]**

Projects

Learning Deception in Adversarial Multi-Agent RL (Thesis Work)

· Developed and analyzed RL agents using actor-critic and policy gradient methods to simulate deception and counter-deception strategies in competitive environments.

Vehicle Speed Estimation Using RNNs and Transformers GitHub

· Estimated vehicle speeds from videos with LSTM and Transformer-based temporal models. *(Python, PyTorch, OpenCV)*

Vision-Language Models for Customer Behavior Analysis

· Analyzed customer behavior using CLIP and Transformer-based multi-camera models for improved re-identification. *(CLIP, Transformers, Re-ID)*

Brain Tumor Classification using CNN GitHub

· Classified MRI scans using convolutional neural networks to aid in early detection. *(CNN, PyTorch, Medical Imaging)*

Age Prediction from Voice Data GitHub

· Predicted speaker age groups through feature extraction from audio data. *(Audio Processing, MFCCs, ML Models)*

Two-Player Tic-Tac-Toe on MSP430

· Implemented an embedded Tic-Tac-Toe game using MSP430 with LEDs, LCD, and buzzer support. *(MSP430, Embedded C, UART, I2C)*

Automation of Cockpit Testing Using Jetson Nano Project Details

· Developed a robotic tester leveraging CNN-based gesture detection for enhanced cockpit testing. *(Jetson Nano, CNN, Grafana)*

Multi-Core Processor Simulation with Cache Coherence

· Simulated a 4-core processor utilizing the MESI protocol and directory-based coherence strategies. *(C++, RISC-V)*

Facial Emotion Based Song Recommendation System Project Details

· Designed a system suggesting songs based on emotion recognition from facial expressions via CNN. *(FER-2013, CNN, Computer Vision)*