

RAJDEEP MUKHERJEE

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Education

University of Michigan

B.S.E. in Computer Science with focus on Intelligent Systems and Minor in Mathematics

Ann Arbor, MI

May 2026

Coursework: Machine Learning, Intro to Artificial Intelligence, Data Structures & Algorithms, Web Systems, Intro to C Programming and Unix, Object-oriented Programming, Computer Organization, Discrete Mathematics, Multivariable Calculus, Linear Algebra, Human-Robot Systems, Applied Probability and Statistics, Reinforcement Learning

Oakland University

B.S. Computer Science with specialization in Artificial Intelligence (Honors College) | School of Engineering and Computer Science

Rochester, MI

April 2024

GPA: 3.92

Skills

Languages: Python, C, C++, Java, HTML, CSS, SQL, SQLite, JavaScript, MATLAB, TypeScript

Technologies: TensorFlow, PyTorch, AWS, Flask, Hugging Face, JMAVSim, PX4 Autopilot, Unreal Engine, NVIDIA Omniverse, Human-Robot Interaction, Git, REST APIs, React, DOM, CUDA

Expertise: Deep Neural Networks (CNNs, RNNs, LSTMs), Reinforcement Learning, Computer Vision, NLP, ML Optimization, System Design

Professional Experience

Amazon Web Services (AWS)

May 2025 – August 2025

Software Development Engineering Intern (AI/ML)

Seattle, WA

- Shipped a production agentic LLM system that auto-generates configuration files with a simple user prompt 24x faster, boosting efficiency by 95.8% at 99%+ accuracy and engineered a modular, extensible architecture to be reused across adjacent projects.
- Built a multi-LLM inference harness to benchmark foundation models across accuracy, latency, and cost.
- Created a comprehensive synthetic dataset modeling real-world ambiguities and long-tail edge cases; used for both training and eval.
- Fine-tuned foundation models on synthetic and curated data to maximize exact-match performance and robustness with instruction tuning.

Research Experience

Oakland University

September 2023 – April 2024

Research Assistant

Rochester, MI

- Team Lead: Led research on [Aero-LLM](#), a distributed framework for secure UAV communication and intelligent decision-making. Co-authored the paper published at ICCCN: IEEE's 33rd International Conference on Computer Communications and Networks in July 2024.
- Designed and implemented the architecture of Aero-LLM, collected data using software-in-the-loop (SITL) and hardware-in-the-loop (HITL) environments.
- Fine-tuned several OPT/Llama2 LLMs using both SFT and RLHF achieving optimized model performance and enhanced decision-making capabilities for UAV communication systems.
- Conducted extensive experiments achieving high accuracy (> 82%), precision, recall, and F1 scores with minimal error rates.

Research Assistant

May 2023 – August 2023

- Researched and developed [Net-GPT](#): A LLM-Empowered Man-in-the-Middle Chatbot for Unmanned Aerial Vehicle and co-authored the paper published at EdgeSP: The Fifth ACM/IEEE Workshop on Security and Privacy in Edge Computing in December 2023.
- Designed and implemented attacks that enable Net-GPT to hijack benign UAVs and gain control over the communication session between UAVs and Ground Control Stations (GCS).
- Conducted extensive experiments to fine-tune LLMs, including Llama-2-7B and Llama-2-13B, showcasing the impressive predictive accuracy of 95.3% and 94.1%, respectively. Explored the trade-off between dataset quantity and the number of fine-tuning epochs.
- Evaluated the generative accuracy of Net-GPT and analyzed generative errors for different LLMs. Explored the cost-efficiency of data size and fine-tuning epochs. Results demonstrated the potential of LLMs in producing accurate network packets and simulating UAV-GCS communications.

Research Assistant

January 2023 – April 2023

- Researched and constructed a [Heterogeneous Generative Dataset for UASes](#) and co-authored the paper published by IEEE International Conference on Mobility, Operations, Services and Technologies (MOST) in May, 2023.

Projects

VTI Aero (Python | PJTL at MCity | UAVs)

January 2025 – April 2025

- Engineered a real-time, GPS-independent localization system by integrating advanced sensor fusion algorithms and on-board processing capabilities, enabling autonomous drone navigation and precise pose estimation without external positioning systems.
- Developed an AI-driven voice command interface leveraging speech-to-text technologies and machine learning models to interpret and execute complex spoken instructions, enhancing user interaction and operational flexibility of the drone.

Retrospect AI (Python | PJTL at MCity | Safety Assurance for Autonomous Vehicles)

August 2024 – December 2024

- Developed a trajectory emulator in Python utilizing spline interpolation and parameterized paths, enabling real-time simulation of vehicle motion with acceleration and jerk constraints, processing 1000+ trajectory points per run with millisecond precision.
- Engineered a data processing pipeline that parsed and analyzed 5000+ data points from CSV input, generating six key motion analysis graphs (trajectory, velocity, acceleration, and jerk) to optimize vehicle trajectory planning and system performance evaluation.

Stock Trading and Analysis (C++ | Binary Heap | Pairing Heap | Priority Queues | Sorted Vector | Unordered List)

September 2024 – October 2024

- Engineered a high-throughput stock order matching engine utilizing custom priority queues and optimized algorithms, enabling real-time processing and execution of millions of buy/sell orders with sub-millisecond latency.
- Developed an advanced median price analytics module using dual-heap structures, providing real-time market insights and enhancing strategic trade decision-making in dynamic trading environments.