Ritam Mukherjee

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EDUCATION

The Ohio State University Expected – May 2026

Master of Science – Computer Science and Engineering | Coursework: Algorithms, Neural Networks, AI, Natural Language Processing

Kalinga Institute of Industrial Technology July 2020 – July 2024

Bachelor of Technology – Computer Science and Engineering (GPA - 3.7/4) | Coursework: DSA, Design and Analysis of Algorithms, Cloud Computing, DBMS

WORK EXPERIENCE

MICROSOFT Bangalore, India

Software Engineer Intern | Python, Azure Machine Learning, Langchain, Generative AI, Git May 2023 – July 2023

Worked on optimizing the deployment of Langchain based Gen-AI applications in AzureML, improving integration and scalability.

- Converted LangChain Retrieval QA chains into MLFlow models for seamless deployment in Azure ML.
- Ensured proper load/store of the retriever in the MLFlow model structure when converting MLFlow models
- Enhanced AI workflows with tracing, logging, and memory management in Azure ML.

Use Case: Streamlined the deployment of RAG-based Gen-AI applications via AzureML UI.

TheDeltaCube.ai Remote, India

Junior Data Scientist | Python, Generative AI, Prompt Engineering, Retrieval Augmented Generation Feb 2024 – May 2024

Developed and optimized AI-based modules for document processing, improving scalability, efficiency, and accuracy in handling large datasets.

- Developed AI-based modules for document summarization, question answering, and translation.
- Optimized application scalability from processing 5-10 pages to 400-500 pages, enabling efficient operations on large datasets
- Implemented Retrieval Augmented Generation(RAG) and advanced chunking, reducing token overflow issues and improving LLM accuracy.
- Revamped application code with modular functions and robust exception handling, reducing debugging time and enhancing scalability.

Use Case: Enhancing AI-driven document processing for multilingual documents for Indian newspaper agencies.

RESEARCH EXPERIENCE

Disease detection from AO-OCT Retinal Scans | Python, PyTorch OSU | Oct 2025 – Present

Working on computational methods to analyze high-resolution retinal images, focusing on segmentation and quantification of microscopic structures and aiming to support early diagnosis and monitoring of retinal diseases such as AMD and diabetic retinopathy.

TEACHING EXPERIENCE

Teaching Assistant – Full Stack Application Development OSU | Aug 2025 – Present

Helped students to create and deploy web apps and APIs including JavaScript/TypeScript Primers, React, .NET, C#

PROJECTS

Comparing Small LLM's Q/A capabilities when fine-tuned on domain-specific Q/A v/s Full Context | Python, PyTorch, HuggingFace Transformers, LoRA OSU | Mar – Apr 2025

- Fine-tuned Qwen 0.5B using LoRA on the QASPER NLP dataset, comparing performance with and without full document context.
- Designed and executed LLM-based evaluation using DeepSeek-R1 for blind answer quality assessment

Multimodal System for Bird Classification | Torchvision, TorchAudio, Numpy, Pandas OSU | Oct – Dec 2024

Developed a robust multimodal classification system that combines visual and auditory data for bird species identification.

- Leveraged ResNet18-based encoders to extract features from image inputs and audio inputs (converted to Mel-Spectrograms).
- Designed a features fusion mechanism to integrate the extracted representations, enabling the system to capitalize on complementary strengths of both modalities for improved accuracy and robustness.

Abelian Sandpile Simulation | Java, Cellular Automata IISER, Kolkata | Jul – Aug 2021

Simulated the Abelian Sandpile Model in Java using rule-based cellular automata, modeling sand-grain distribution and avalanche propagation with a dynamic N×N matrix, including robust cascading-avalanche logic to prevent infinite loops and study self-organized criticality and power-law behavior.

SKILLS

Programming: Java, Python, C, C++, HTML, CSS, JavaScript, React, .NET, C#, Linux Shell Scripting
Cloud and Databases: Oracle SQL, SQLite, CosmosDB | Azure, AWS
Frameworks and Libraries: Flask, PyTorch, HuggingFace Transformers Langchain, OpenCV, Streamlit, Bootstrap,
DataScience and Machine Learning: Azure Machine Learning, Ohio Supercomputer Center, Google Colab
Tools & Technologies: GitHub, Bitbucket, Postman, Linux

COURSES

Winter School on Deep Learning 2024 | Indian Statistical Institute, Kolkata January 2024 – March 2024

Overview - Completed an advanced AI bootcamp, featuring lectures including faculty from Princeton, CMU, MIT, and OpenAI.
Coursework - Matrix Calculus, Linear Algebra, PyTorch, Gradient Based Optimization Techniques, ANNs, CNNs, GNNs, Transformers, GANs, Diffusion, LLMs, Deep Reinforcement Learning, Topological Deep Learning, Prompt Engineering.

LEADERSHIP

HackOHI/O | Mentor **October 2024**

HackOHI/O is The Ohio State University's largest annual hackathon. In its 2024 edition, featuring challenges from Intel, Honda, and American Electric Power, I guided participating teams in brainstorming, designing, and implementing innovative solutions, while providing technical advice and project development support.