Riju Mukherjee

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Overview

Full-stack **AI/ML Engineer** with 4+ years of industry experience building scalable **Generative AI, Forecasting, and Recommendation Systems**. Skilled in designing and deploying **end-to-end AI solution**s, from research and development to **productionization**, with a proven record of **leading teams, publishing open-source tools, and turning research into impact**. I bring together expertise and interest in A**rtificial Intelligence, Data Science,** S**oftware Engineering, Neuroscience, Reinforcement Learning, and Robotics**. Exploring opportunities to leverage my expertise and drive innovation in AI, while continuously learning and making a meaningful impact.

Experience

Founding AI Engineer

EchoMarket | USA | Aug 2025 - Present

- Designed and implemented the **core AI architecture** powering EchoMarket — a content marketing platform for brands and creators.
- Developed **Generative AI agentic workflows** using **LangChain and LangGraph**, enabling automated content evaluation across key parameters such as **accuracy, relevancy, and creativity.**
- Built a **Retrieval-Augmented Generation (RAG)** pipeline with **MongoDB-based vector storage**, **semantic chunking, and web search integration** for real-time fact retrieval.
- Engineered **multi-modal content analysis**, generating **textual representations of images and videos** to enhance understanding and scoring by AI agents.
- Architected and **Dockerized backend microservices**, deploying to **DigitalOcean App Platform** with managed databases, scalable containers, and asynchronous API orchestration.
- Collaborated with the founding team to define **AI-driven business logic** and make **system-wide engineering decisions**, covering infrastructure, data pipelines, and model deployment.

Research and Development Intern — AI/ML

Philips | Netherlands | Aug 2024 – Feb 2025

- Designed and developed **Energy Monitoring Tool (EMT)** to measure real-time energy consumption of ML pipeline code, enabling sustainable AI benchmarking.
- Implemented **process-level energy profiling** with hardware-level granularity across **CPU (RAPL)** and **Nvidia GPU** devices.
- Enhanced system performance and usability by **optimizing core logic,** integrating **TensorBoard visualization**, and an **interactive dashboard** for live analytics.
- **Open-sourced EMT** as part of Philips' **Sustainable AI Initiative,** advancing transparency and efficiency in energy-aware machine learning research.

Senior Data Scientist / AI Engineer

UST Global - Capital Group | India | Mar 2022 – Aug 2023

- Developed a **Multi-Time Series Forecasting System** using a transformer-based **Temporal Fusion Transformer** (TFT) model.
- Built a **large-scale** forecasting system handling **1.5M+ individual time series, 150M+ data points.**
- Engineered an **optimized Spark + TensorFlow**-based feature engineering workflow, optimized for **multi-node, multi-GPU** parallelism to achieve major speedups in model training.
- **Led end-to-end delivery,** from literature review to **scalable model architecture, evaluation,** and **deployment**.
- Provided **technical leadership** across two cross-functional data science teams and **mentored five junior data scientists**.
- Conducted **30+ interviews** for data science roles, helping define hiring standards and team structure across AI initiatives.

Data Scientist / AI Engineer

UST Global - Capital Group | India | Dec 2020 – Mar 2022

- Implemented an omnichannel **Graph Recommendation System,** achieving better offline accuracy than the baseline models.
- **Designed and built** the project architecture from scratch, training **Graph Neural Networks** and **Graph Convolutional models** such as *HeteroSage*
- Proposed and implemented a new recommendation **accuracy calculation method** – **Mean Average Intersection (MAI)**
- Experimented with **Explainable-AI (XAI)** methods for link prediction in GNNs using **Graph Attention Networks (GATs)** to increase the **interpretability.**
- **Productionized** a scalable recommender system serving over **300 products and 300K+ users.**
- Contributed features to **open-source** libraries, including **DGL**, improving model efficiency and reproducibility.

AI-ML Systems Engineer

Tata Consultancy Services - Albert Heijn | India | Jun 2019 – Dec 2020

- Developed a **time series forecasting system to** predict **store-level transactions** for Albert Heijn, the Dutch retail chain.
- Developed the ***New Store*** solution to forecast customer footfall for **cold-start stores**, solving the zero-history prediction challenge.
- Implemented a **new algorithm to cluster time-series data** to identify **reference stores** with similar demand patterns.
- Built a **COVID-19 recovery forecasting module** to handle stores reopening after long closures, achieving **70% higher accuracy** over baseline models.
- Migrated code base from **R and Python to PySpark** in **Azure Databricks,** enabling scalable, distributed training and faster data processing.

Machine Learning Engineer Intern

Tata Consultancy Services | India | Jan 2019 – Apr 2019

- Worked on Time Series forecasting using Statistical methods- **ARIMA, SARIMAX, LSTMs**
- Implemented CNNs using **Tensorflow, Keras,** and a **custom-trained YOLO-v3 model** for object detection.
- Learned about **GANs** and implemented **Cycle GAN.**
- Learned **Reinforcement Learning** and **Deep-Q Learning.**

Education

Maastricht University | Maastricht, Netherlands | Sep 2023 – Aug 2025

Department of Advanced Computing Sciences

***MSc. Artificial Intelligence (AI)*|** GPA – 7.9/10

Master's Thesis: "Can Robots Go Grocery Shopping? Brain-Inspired World Models for Universal Reinforcement Learning."

Relevant Coursework: Advanced Machine Learning, Advanced Natural Language Processing, Reinforcement Learning, Autonomous Robotics System, Multi-Agent System, Explainable AI, Intelligent Search and Games

Heritage Institute of Technology| Kolkata, India | Aug 2015 – Jun 2019

Maulana Abul Kalam Azad University of Technology, Kolkata, India

***B Tech. Electronics and Communication Engineering*|** GPA – 8.8 /10

Undergraduate Project: Designed a **32 KB SRAM** for a product development project (research towards productisation) under the prestigious India Chip Program (Make in India Initiative) in collaboration with eCOE (Electronic Centre of Excellence, supported by ESSCI, Skill India).

Skills

Languages: Python, PySpark, C++, SQL

Deep Learning Frameworks: Pytorch, Pytorch-Lightning, Tensorflow, Pytorch-forecasting, Pytorch-Geometric, DGL, Nixtla

Gen-AI: LLMs, Prompt Engineering, COT, RAG, AI-Agents, LangChain, LangGraph, Temporal Fusion Transformers(TFT), Attention

Machine Learning: Time-Series Forecasting, Recommendation Systems, Linear Regression, Hierarchical Clustering, Reinforcement Learning, Natural Language Processing (NLP), Graph Neural Networks (GNNs), Scikit-learn, XGBoost, ARIMA, SARIMAX, LSTMS, CNN, YOLO, GANS, RASA, MLOps, WandB, Explainable AI, LIME, SHAP

Cloud and tools: MongoDB, MySQL, AzureDB, Azure Databricks, AWS-S3, DigitalOcean, Git, Devops, CI-CD, Linux