DEBARSHI CHAKRABORTY

MSc in Big Data Analytics
RKMVERI, Belur Math, West Bengal, India

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PROJECTS

- **Real Time (T+0) Trade Settlement for the US Market**
  Agentic AI| LLM | DLT [Link] *June 2025 - Ongoing*
  - Designed a permissioned blockchain system using Hyperledger Besu and IBFT-2 consensus for atomic delivery-versus-payment (DvP) settlement of tokenized securities and cash.
  - Integrated Agentic AI for real-time trade validation, liquidity checks, and exception handling.
  - Utilized large language models (LLMs) for compliance reporting and anomaly detection.
  - Incorporated a **human-in-the-loop mechanism** to inspect and override suspicious or anomalous activities flagged by AI agents.
  - Designed and ran Monte Carlo simulations comparing T+0 with T+1 models, demonstrating a 91.7% reduction in counterparty risk exposure.
  - Planned stress testing to simulate 10,000+ trades per day under peak-load conditions to evaluate system performance and scalability.
- **Deep Learning based Document Summarization and Question Answering**
  Deep Learning | NLP | DistilBERT [Link] *Jan 2025 - May 2025*
  - Implemented a GRU-based Seq2Seq model with attention for document summarization.
  - Fine-tuned DistilBERT for extractive question answering on benchmark datasets.
  - Evaluated using ROUGE, BLEU, BERTScore, and Exact Match metrics.
  - Deployed the application using Streamlit for an interactive user interface.
- **Distributed Inference for Large Language Models**
  Distributed Computing| C++ | Python [Link] *Jan 2025 - May 2025*
  - Set up a distributed computing cluster to deploy LLMs such as DeepSeek R1 Distill and LLaMA 3.2B Instruct, achieving a 2–4× increase in tokens/sec throughput.
  - Conducted an extensive literature review on LLM inference strategies including tensor, model, and data parallelism.
  - Analyzed GitHub repositories of distributed LLM systems; documented architecture, scaling behavior, and memory layout.
- **Mood-Based Music Recommendation System**
  Scikit-learn | Pandas | Matplotlib[Link] *Sep 2024 - Nov 2024*
  - Built a classification model using Spotify data to categorize songs into 7 mood categories with 92% accuracy.
  - Developed a content-based recommendation engine using cosine similarity.
  - Resolved class imbalance with SMOTE and improved accuracy using ensemble methods.

COURSEWORK

- Machine Learning
- Deep Learning & NLP
- Distributed Computing & Graph Databases
- Computer Vision
- Data Structures & Algorithms
- Probability & Stochastic Processes
- Finance & Econometrics
- Time Series Analysis
- Reinforcement Learning

ACHIEVEMENTS/CERTIFICATIONS

- Research paper titled *"Real Time Trade Settlement for the US Market"* accepted at the **3rd World Conference on Communication & Computing (IEEE WCONF)** and will be published in the proceedings.
- Qualified for IIT JAM 2024(Mathematics) conducted by IIT Madras
- Optimization Theory and Algorithms, NPTEL

EXPERIENCE

Summer Research Intern

Indian Institute of Technology, Guwahati

May 2025 - July 2025 | Guwahati, India

- Collaborated with PhD researchers to design algorithms for the **Popular Matching Problem** in subcubic graphs and graphs with maximum degree 7.
- Developed and analyzed **greedy-based algorithms** to determine the existence of popular matchings under bounded-degree constraints.
- Implemented prototype solutions in `Python`, and conducted theoretical performance evaluations.
- Gained hands-on experience in graph theory, complexity analysis, and algorithm design in a research setting.

EDUCATION

- **Ramakrishna Mission Vivekananda Educational and Research Institute, Howrah**
  MSc in Big Data Analytics
  2024 – Present CGPA: 7.00
- **Ramakrishna Mission Vivekananda Centenary College**
  BSc(H) in Mathematics
  2021 – 2024 CGPA: 7.63

TECHNICAL SKILLS

- **Programming Languages**: Python, Java, R
- **Libraries & Frameworks**: NumPy, Pandas, Matplotlib, Seaborn, Scikit-learn, PyTorch, OpenCV, Neo4j, LangChain, LangGraph
- **Tools & Platforms**: Git, GitHub, Docker, VS Code, Jupyter Notebooks, Windows, Linux (Ubuntu)

VOLUNTEERING

- **Placement Volunteer, RKMVERI**
  – Assisted the Placement Cell for the Batch of 2024-26
- **Perceptron Volunteer, RKMVERI**
  – Assisted in managing and organizing events at the University's Annual Tech Fest, **Perceptron 2025**