

# AYAN BANERJEE

M.Sc. in Big Data Analytics

Ramakrishna Mission Vivekananda Educational and Research Institute, Belur Math, West Bengal, India

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Portfolio

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## PROJECTS

- **Movie Recommendation System:** Jan.'25 - Apr.'25, RKMVERI
  - Recommending movies based on collaborative filtering using Graph Neural Networks (GNN).
  - Implemented and evaluated multiple GNN architectures including GCN, GAT, and LightGCN for user-item interaction modeling.
  - Achieved improved recommendation accuracy over traditional Matrix Factorization-based models by leveraging graph structures.**Faculty:** Mr. Champak Dutta
- **Music Segmentation:** Jan.'25 - Apr.'25, RKMVERI
  - Extracted drums, vocals, bass, and others from stereo music tracks using Deep Learning trained on the MUSDB18 dataset.
  - Designed and compared classical signal processing methods (Frequency Thresholding, Spectrogram Masking) with a U-Net based Deep Learning model for source separation.
  - Achieved superior separation quality using the U-Net model, evaluated using SDR metric.**Faculty:** Dr. Soumitra Samanta
- **Bengali OCR:** Jan.'25 - Apr.'25, RKMVERI
  - Developed an Optical Character Recognition (OCR) system for hand-written Bengali characters.
  - Built and evaluated CNN models (LeNet-5, ResNet18), achieving 94.33% validation accuracy with ResNet18.
  - Performed data augmentation, normalization, and OpenCV-based preprocessing to improve model generalization.**Faculty:** Br. Bhaswarachaitanya
- **Heart Disease Prediction:** Aug.'24 - Nov.'24, RKMVERI
  - Predicted the presence of heart disease using classical Machine Learning algorithms on the UCI Heart Disease dataset.
  - Performed extensive data preprocessing, feature selection, and model comparison (Logistic Regression, Random Forest, SVM).
  - Achieved high accuracy and precision through hyperparameter tuning and cross-validation.**Faculty:** Br. Bhaswarachaitanya

## COURSEWORK

- Deep Learning
- Time Series & Survival Analysis
- Probability and Stochastic Process
- Data Structures and Algorithms
- Natural Language Processing
- Computer Vision
- Artificial Intelligence
- Machine Learning
- Statistics
- Econometrics & Finance
- Reinforcement Learning
- Joy of Computing using Python
- Universal Human Values

## EDUCATION

- Ramakrishna Mission Vivekananda Educational and Research Institute, Howrah  
**M.Sc. in Big Data Analytics**  
(Rank: 1/27)
  - 📅 2024 - Present (Sem-1) CGPA: 8.78
- Serampore College  
**B.Sc.(H) in Mathematics**
  - 📅 2021 - 2024 CGPA: 9.032
- Hooghly Branch Govt School  
**Class(10+2)**
  - 📅 2019 - 2021 Score: 95.8%
- Elite Co-Ed School  
**Class(10)**
  - 📅 2008 - 2019 Score: 92.14%

## TECHNICAL SKILLS

- **Programming Languages:** Python, R, SQL,  $\LaTeX$
- **Libraries & Frameworks:** Pytorch, NumPy, Pytorch Geometric, OpenCV, Scikit-learn, Pandas, Matplotlib.
- **Tools:** MS Office
- **Operating System:** Windows, Linux (Ubuntu)

## ACHIEVEMENTS & CERTIFICATIONS

- **Topper** in B.Sc. Mathematics, 2021-24 (Serampore College)
- Top 5% in NPTEL, Joy of Computing with Python

## HOBBY

- Reading books on personal finance, motivation, and self-development.
- Playing Volleyball
- Games