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

PROJECTS

- **FinGraphMixer: An Architecture Fusing Graph Neural Networks and Wavelet Mixers for Financial Time Series:** *July.'25 - Present , RKMVERI*
  Faculty: *Mr. Champak Dutta*
- **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 handwritten 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