AJOY SARKER

+880-1740-114915 ajoy.stu20181@juniv.edu Portfolio Google Scholar
linkedin.com/in/ajoysrju github.com/AJOYSR huggingface.co/ajoysr

Research Objective

PhD applicant focused on **EEG-based signal processing, deep learning, and efficient AI systems**. Interested in developing robust models for **biomedical signal/image analysis and real-world noisy data**, with emphasis on **temporal modeling, multimodal learning, and edge-efficient architectures**. Strong alignment with CVG's work on neurological signal analysis, medical imaging, and environmental sensing.

Education

Jahangirnagar University Dhaka, Bangladesh
M.Sc. in CSE (AI/ML) CGPA: 3.75 / 4.00 May 2024 – Sept 2025

Jahangirnagar University Dhaka, Bangladesh
B.Sc. in CSE CGPA: 3.68 / 4.00 Feb 2019 – Mar 2024

Research Publications

[1] **Ajoy Sarker**, M. Z. Rahman. "Abusive Language Detection in Bengali Social Media." *Under review.*
Contribution: Designed stacked ensemble (LinearSVC, LR, XGBoost) with multi-level TF-IDF features; achieved **91.2% accuracy** on 15-class classification (+1.9% over prior work).

[2] **Ajoy Sarker** et al. "Road Accident Severity Prediction." *BUET-ARI Collaboration.*
Contribution: Trained CatBoost/XGBoost/RF on **500K+ records**; achieved **F1 = 0.65**; handled class imbalance and large-scale feature engineering.

[3] **Ajoy Sarker** et al. "Emotion Detection from EEG Signals." *Ongoing.*
Focus: End-to-end pipeline for EEG classification using preprocessing, band-power features, and CNN/RNN/Transformer models.

Open-Source Models

Bangla Math LLMs (Gemma & LLaMA) LoRA, PEFT

- Fine-tuned LLMs for Bengali mathematical reasoning; built dataset, training pipeline, and evaluation benchmarks.

Bangla Sarcasm Bi-Encoder Sentence-Transformers

- Dual-encoder architecture improving semantic understanding in low-resource NLP tasks.

Professional Experience

Brain Station 23 PLC — Software Engineer (AI/ML) Dhaka, Bangladesh
Mar 2024 – Present

- Built production ML systems handling **100K+ daily records** across multimodal pipelines (vision, OCR, audio).
- Designed RAG-based retrieval systems with **sub-200 ms latency** and **92% relevance accuracy**.
- Improved inference efficiency by **50%** using quantization and batching (edge-oriented optimization).
- Developed monitoring pipelines (Prometheus, Grafana) for drift detection and real-time performance tracking.

Selected Research & AI Projects

EEG-Based Emotion Detection TensorFlow, Signal Processing

- Developed pipeline for EEG classification: preprocessing, feature extraction, and temporal modeling (CNN/RNN).

Bengali NLP Ensemble (SOTA) Scikit-learn, XGBoost

- Achieved **91.2% accuracy** using stacked ensemble and multi-level TF-IDF features.

Accident Severity Prediction CatBoost, XGBoost

- Large-scale classification on **500K+ records**; F1 = 0.65.

Technical Skills

Core: Python, PyTorch, TensorFlow, Scikit-learn, XGBoost, Signal Processing (EEG, time-series)
ML Systems: RAG, Transformers (LLaMA, Gemma), LoRA/PEFT, Semantic Search, Multimodal Pipelines
MLOps: Docker, CI/CD, Prometheus, Grafana, AWS
Backend: FastAPI, NestJS, PostgreSQL (pgvector), MongoDB

Honors & Achievements

- **NST Fellowship** — Ministry of Science & Technology, Bangladesh
- **University Scholarship** — Awarded 4 times for academic excellence
- **AI Hackathon 2025** — Ranked 11/90 teams
- **CodeSamurai 2022** — Ranked 29/500+ teams
- **Competitive Programming** — 2000+ problems solved