

Soumedhik Bharati

☎ Contact Number | ✉ Mail | 🌐 Personal Website | 🔗 LinkedIn | 🐙 Github | 📍 West Bengal, India

EXPERIENCE

Exalt Data (UChicago Polsky Center Build & Launch 2025)

Chief Technology Officer (CTO)

Remote

June 2025 – Present

- Led core ML systems, including an 800+ feature voter behavior pipeline and production retrieval-reasoning for news intelligence.
- Introduced FROST, an inference-time optimization framework for production retrieval-reasoning with 28% cost reduction vs Self-Consistency ensembles (**ACL Industry 2026**, first-author, accepted).

Indian Institute of Technology Kharagpur

Kharagpur, India

Research Intern (Completion Certificate)

May 2025 – July 2025

- Designed PSI-Rank, a IR reranking pipeline and executed over 2,400 large-scale LLM experiments, boosting throughput for complex query loads by up to **3x** and cuts inference time by **33%** and **66%** over top-down and sliding window approaches (**Preprint**).

Indian Institute of Technology Hyderabad

Sangareddy, India

Research Intern

Jan 2026 – Present

- Developing a culturally sensitive evaluation framework to benchmark socio-cultural and regional linguistic alignment in LLMs.

Xu Lab, Carnegie Mellon University

Pittsburgh, PA (Remote)

Undergraduate Researcher

Sept 2025 – Present

- Developing a few-shot transfer learning pipeline for multimodal EEG/fMRI signals, targeting a **12%** improvement in zero-shot prediction and **95%** reduction in labeling requirements over SOTA baselines (e.g., BrainOmni).

Sister Nivedita University

Kolkata, India

Undergraduate Researcher

Mar 2024 – Present

- Engineered HCAT-Net, a novel ResNet-Transformer architecture that delivered **99.8%** accuracy for EEG emotion classification (Best Paper at **IEEE CIACON 2025**).
- Demonstrated LLM orthographic fragility (41% degradation), **enabled zero-annotation morphology discovery for Hausa Ajami (99.9% coverage)**, and built the **first 6-way Sorani Kurdish dialect classifier (91.9% accuracy)**; **EACL 2026** (2 Orals, 1 Poster).
- Secured an **82% success rate** in optimizing employee training curricula by formulating a novel RL agent to solve the multi-objective task under a hard budget constraint (Presented at QuantumKol 2025).
- Engineered CADET, a novel BiLSTM architecture with multi-head attention, setting a new SOTA with a QWK of **0.98** on the ASAP and AES 2.0 essay grading datasets (journal under review).
- Achieved **97.2%** DNA sequence classification accuracy by engineering a novel encoding technique for a hybrid CNN-BiLSTM model, reducing the model footprint by **35%** over OHE baselines (journal under review).
- Reduced trainable parameters by **55%** while achieving state-of-the-art performance on the RESIDE benchmark by optimizing a multi-scale U-Net integrated with a Mamba state-space model for image-to-image dehazing (*Under Review*, **Preprint**).

Ramakrishna Mission Shilpamandira

Belur Math, India

Visiting Faculty (AI/ML)

Oct 2025 – Present

- Led a 3-month Faculty Development Program (FDP) to upskill professors on LLMs, Gen AI, and deployment strategies.

Rapid.ai

Remote

R&D Intern

Apr. 2025 – June 2025

- Improved HCC code extraction accuracy by **12%** using novel DL architectures for unstructured clinical notes.
- Reduced ingestion and preprocessing time by **25%** on large-scale medical data via parallelism and optimized queries.

University of Lille

Remote

Collaborative Researcher

Feb 2025 – Present

- Designed and implemented a deep learning surrogate model to map Hamiltonian control parameters to the final evolved quantum state, yielding an R^2 of **0.94** against the ground-truth solver (manuscript under review).

EDUCATION

Sister Nivedita University

Kolkata, India

B.Tech in Computer Science Engineering — CGPA: 8.68/10.0

Sept. 2022 – Sept. 2026 (Expected)

- **Leadership:** Machine Learning Lead, SKEPSIS; Core Technical Team ML Lead, Google Developer Group (GDG) SNU.

AWARDS & CONFERENCES

- **2nd Prize**, BRICS International Vocational Skills Offline Competition 2024, Shandong, China. (**Certificate**)
- **Top 3 Teams**, ICDMAI Offline Hackathon 2025 (from 1000+ teams). (**Certificate**)
- **1st Place**, SAP ICOE Hackathon 2024 (from 400+ teams). (**Certificate**)
- **1st Place**, Intel OneAPI Hackathon 2024 (100+ teams) (**Certificate**) and Pragati 2k24 ML Mania Competition (**Certificate**).
- **Selected for India Regional Bootcamp**, Google Solution Challenge 2024. (**Certificate**)
- **Best Presenter Award**, IEEE CIACON 2025 – Presented research on HCAT-Net for EEG Emotion Classification. (**Certificate**)
- **Outstanding AI/ML Research Contribution Award**, SNU Connect 2025. (**Certificate**)
- **Attendee**, ICDMAI 2025 & **BRICS International Big Data & AI Conference** and **AI Working Committee**, Chongqing, China.

SKILLS

Languages: Python, R, C, C++, SQL

Frameworks & Libraries: PyTorch, TensorFlow, Hugging Face, Faiss, Elasticsearch, Scikit-learn, ONNX, Weights & Biases (W&B)

Specializations: NLP, CV, Time Series Forecasting, Reinforcement Learning, Information Retrieval, RAG, Vector Databases

PROJECTS

Automatic Essay Grading System | [GitHub](#) 📄

Hackathon Winner

- Attained a QWK of **0.674** on the ASAP/AES datasets using a multi-head attention BiLSTM, improving coherence by **8.3%**.

Assistive System for Blind People | [GitHub](#) 📄

Hackathon Winner

- Achieved **99.4%** accuracy at **25 FPS** on-device for currency detection with a multi-task YOLOv9/MIDAS/ResNet50 system.

Image-to-Music Synthesis System | [GitHub](#) 📄

Hackathon Winner

- Synthesized music with high tonal and emotional alignment to visual input by fabricating a modular image-to-music pipeline using a Vision Transformer and diffusion models.