Aritra Bandyopadhyay

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Education

Indian Institute of Engineering Science and Technology (IIEST) *2021 – 2025*
Bachelor of Technology in Computer Science

- GPA: 9.85/10.0
- **Coursework:** RL, ML, Theory of Computation, Quantum Computing, Algorithm Design, Signals & Systems

Experience

Research Scientist *California, USA (Remote)*
Manifold Research Group (Open Source Research Lab) *Nov 2024 – Present*

- Member of Metacognition Core Team - Project Lead on self-evaluation, calibration of Multimodal models (LLMs, VLMs, VLAs) and improving reasoning at test-time

Machine Learning Engineer *California, USA (Remote)*
*Brighterway (YC S24 - **2nd Hire @ Seed Stage**)* *Dec 2024 – Present*

- Owned production document intelligence with LLM & VLMs for medlegal (workers' comp) records; contributed to 2× revenue since joining
- Built evals & observability (benchmarks, regressions, monitoring), working directly with founders and enterprise clients

Machine Learning Research Intern *SC, USA (Remote)*
Artificial Intelligence Institute of University of South Carolina (AIISC) *Sept 2024 – Aug 2025*

- Investigating Safety Alignment & adversarial robustness of Text-to-Image models through training-free model editing and fine-tuning methods (LoRA, DPO)

Research Fellow *Berkeley, USA (Remote)*
Supervised Program for Alignment Research *Feb 2025 – May 2025*

- Worked under Shashwat Goel (Max Planck Intelligent Systems) in post-training interventions and model differences
- Worked under Jacek Karwowski (Oxford University) in understanding and verifying the autoregressive conditioning hypothesis for LLMs in chess-playing, steering vectors for small models

ML and Computer Vision Research Intern (DAAD-WISE'24) *Munich, Germany*
Technical University of Munich (Klinikum rechts der Isar) *May 2024 – Sep 2024*

- Developed a novel point cloud registration technique for multi-modal (ultrasound-tactile) data, using coarse-to-fine alignment and learned similarity metrics (LC^2, DISA) for improved 3D registration
- Investigated the effectiveness of different registration baselines (ICP, CPD) for improving 3D path-transfer accuracy between ultrasound and other modalities (Tactile, CT, MRI)

Machine Learning Engineer *California, USA (Remote)*
*Mercor **(3rd Hire - Pre-Seed to Series A**)* *May 2023 – Aug 2024*

- **3rd internal team hire (pre-seed)**, architected and deployed Agents to source & evaluate candidates, including the AI Interviewer, Codebase Analyzer, driving a 150% increase in quarterly revenue and a 10x expansion of the customer base
- Led development of an Information Retrieval pipeline boosting search relevance for sourcing by 60%
- Built SFT & Evaluation frameworks for Internal tools, with semantic chunking for 30% higher parsing accuracy

Machine Learning Research Intern *Kharagpur, India*
Indian Institute of Technology (IIT), Kharagpur *May 2023 – Nov 2023*

- Worked on Time-Series analysis & fraud detection in Smart Grids, focusing on explainable AI techniques like LIME and SHAP, achieving 97% agreement with domain experts
- Implemented Attention Pattern Visualizations for justifications of predictions for Transformer-based models

Quantum Computing Research Intern *Kolkata, India*
Indian Statistical Institute (ISI), Kolkata *July 2023 – Sept 2023*

- Implemented quantum algorithms for Cryptography, Fourier analysis, and Iterative HHL with Quantum Phase Estimation

Publications

Differential Evolution Algorithm Based Hyper-Parameters Selection of Convolutional Neural Network for Speech Command Recognition *In Proceedings of the 15th International Joint Conference on Computational Intelligence (IJCCI-ECTA 2023)*
S Dhar, A Sen, ***A Bandyopadhyay***, ND Jana, A Ghosh, Z Sarayloo 10.5220/0012251500003595

Achievements

SPAR Research Fellow'25 x2: Research Fellow for 2 projects in SPAR
DAAD WISE 2024 Scholar: One among 200 in India to receive the prestigious DAAD WISE Fellowship
Perfect 10/10 Grade in 2 Semesters: Scored a perfect 10/10 SGPA in my 6th and 3rd Semesters
Code For Good'24 - JPMC: Among the 3,000 in India selected for JPMC's Code For Good event
1st in BrainDead: Team secured 1st place in IIEST's Inter-University ML Hackathon (Animated Emotion Recognition)
5th in RootAccess: Team secured 5th place in IIEST's Inter-University Capture-the-Flag (CTF)

Projects

BrainQuery *BrainQuery*

- Full-stack semantic search web-app for arXiv, implementing hybrid search (dense and SPLADE sparse embeddings) for enhanced retrieval accuracy (Pinecone, Flask, ReactJS)

MOVIE++ *MOVIE++*

- Full-stack movie recommendation web-app that leverages item-based collaborative filtering and SVD matrix factorization trained on the MovieLens 25M dataset (Surprise, Pandas, Scikit-learn, Flask, ReactJS)

Research Interests & Technical Skills

Research Domains: Mechanistic Interpretability, Alignment of Foundation Models, Vision-Language Models (VLMs), Model Editing, Agentic Systems, Computer Vision (3D Scene Understanding, Semantic Segmentation), Continual Learning
Technical Skills: PyTorch, Transformers (Hugging Face), TransformerLens, TensorFlow, Keras, OpenCV, Scikit-learn, SciPy, Pandas, NumPy, GCP (App Engine, Cloud Run, Cloud Functions), AWS (EC2, S3), Azure, SQL, C, C++, Linux