Aniruddha Chattopadhyay

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Education

Indian Institute of Technology, Kharagpur 2017 – 2022
B.Tech + M.Tech in Industrial Engineering (Industrial Electronics) CGPA: 8.66/10.0
Minor in Computer Science (9.31/10) with Micro specialization in AI (8.74/10)

Experience

Senior ML Engineer | ***Full Time*** Apr. 2025 – Present
PVX Partners *Singapore*

- Researching and developing **multimodal AI agents** capable of generating real-time commentary for mobile game ads by interpreting video, audio, and on-screen text signals.
- Leveraging **vision-language models (VLMs)** and **LLMs** in a coordinated agentic framework to describe gameplay events and player actions with contextual flair.
- Designed a **reinforcement-feedback loop** for evaluating commentary quality using engagement and semantic coherence metrics, enabling continuous model refinement.
- Optimizing the agent pipeline for **low-latency, on-device inference**, allowing scalable deployment across diverse ad formats and geographies.

Applied LLM Engineer | ***Full Time*** Mar. 2024 – Apr. 2025
Maxim AI *Bangalore,India*

- Developed **LLM-based evaluators** for automated assessment using optimized **Chain-of-Thought prompting** and adaptive **LangChain** callback mechanisms for efficient token utilization.
- Fine-tuned a **LLaMA model** on the **AI4Privacy** dataset integrated with **Presidio**, achieving enhanced detection and anonymization of PII in textual data.
- Authored the **maxim-py SDK**, enabling structured logging and quantitative evaluation of LLM workflows for reproducible AI research.
- Developed autonomous **AI red-teaming agents** using the **Garak** framework to simulate vulnerability assessments in generative AI systems.

Data Scientist | ***Full Time*** Aug. 2022 – Mar. 2024
AB InBev *Bangalore, India*

- Researched and deployed **unsupervised clustering models** across six European markets, informing strategic segmentation worth $2M+.
- Developed **delay-risk prediction models** for US and Canada logistics, improving forecast precision and operational reliability.
- Enhanced existing ML pipelines, achieving a **25% F1-score gain** and demonstrating significant EBITDA uplift.
- Awarded the **Pint Award** for excellence in data science research and impact delivery.

Lead ML Engineer | ***Volunteer*** Nov. 2022 – Present
Turn The Bus, NGO *Remote*

- Led research on **multimodal retrieval-augmented generation (RAG)** using ColPali over NCERT textbooks for automated doubt resolution.
- Designed the full **RAG pipeline** and model-serving stack using Flask backends and React/Kotlin interfaces.
- Integrated **OpenEDX** and Django resources to improve educational content accessibility and evaluation workflows.

Research

Publication in NeSy 2025 (Neurosymbolic Learning and Reasoning Conference) | Link May 2025

- First-author long paper on **Metatuning**, a novel lightweight adaptation framework for aligning large language models (LLMs) with symbolic reasoning objectives.
- Introduces **metatuning** as a middle ground between few-shot prompting and full fine-tuning, enabling efficient structural alignment on consumer hardware.
- Accepted at the **Neurosymbolic Learning and Reasoning Conference (NeSy 2025)**; proceedings to appear in the **Journal of Machine Learning Research (JMLR)**.*[Link]*

- Extended version submitted to the **Neurosymbolic Artificial Intelligence (NAI)** journal for peer review.
- Research conducted under mentorship of Kaushik Roy (Asst. prof **University of Alabama**) and presented at **NeSY 2025 in San Diego**

Publication in ACM/IEEE Joint Conference on Digital Libraries (JCDL 2020) | Link Aug. 2020

- Presented **EduTree**, an academic genealogy graph (AGG) modeling mentorship lineages and institutional influence within the field of education.
- Applied **graph-theoretic centrality measures** and **topic modeling** to quantify researcher impact and trace the evolution of research clusters.
- Identified high-centrality mentors, pioneering institutions, and thematic trajectories shaping the discipline's academic network.
- Awarded **Best M.Tech Thesis Project** for contributions to network science and machine learning.

Entrepreneurship

2Vid | Link 2023–2025

- Developed a **UGC video generation platform** enabling AI-created content through automated **storyboarding**, **text-to-speech**, **face-swapping**, **lip-syncing**, and compositing.
- Designed and implemented **AI-driven video pipelines** using **DeepFaceLab**, **Wav2Lip**, and **OpenCV** for seamless facial reenactment and synchronization.
- Built an automated **B-roll generation system** leveraging web scraping, **video understanding models** (**Qwen2.5-VL**, **Video-LLaMA**), and **Unreal Engine** for physics-based storytelling.
- Optimized **GPU-accelerated microservices** for text-to-speech and face-swapping, achieving fast, scalable video synthesis.

Care4U (Acquired) | Link 2017–2019

- Built an AI-driven elderly healthcare app using **TensorFlow Lite** for on-device fall detection.
- Developed an **LSTM model** leveraging accelerometer and gyroscope data to detect falls in real time.
- Integrated emotion recognition, medicine reminders, and caregiver connectivity modules.
- App gained national media coverage, later **acquired by Govt. of West Bengal**, now serving **1M+** elderly users.

Bookopedia | Link 2018–2020

- Founded an online marketplace for buying and selling used books.
- Onboarded 300+ sellers from **College Street, Kolkata** — Asia's largest used books hub.
- Scaled operations to an annual recurring revenue (ARR) of **$750K** by third year of undergrad.
- Authored and published **Sharp Cookie**, a curated collection of previous-year IIT Kharagpur question papers and solutions.
- Distributed 5000+ copies; project now maintained as open-source and archived in the **National Digital Library of India**.

Competitions and Awards

International Hackathons | Link 2025

- **Winner – Daft-Daytona Hackathon:** Built an AI agent for interior design using **Gemini nano Banana** and **Nano VLM**, enabling layout-preserving redesigns; won **First Prize**.*[Link]*
- **Winner – Neo4J x SambaNova Hacknight:** Created a persistent memory system for coding agents using **Neo4J** and **SambaNova**, winning the **SambaNova Track**.*[Link]*
- **YC Overnight Hackathon:** Invited participant at the prestigious **Y Combinator** Overnight Hackathon in San Francisco.

National Hackathons | Link 2017–2024

- **Winner – EF GenAI Hackathon (2023):** Built a **prompt-to-video** engine with intelligent image selection, sentiment-based BGM, and multilingual support; winner from 200+ participants.*[Link]*
- **Winner – HSBC AI Hackathon (2018):** Built a conversational AI using **tkinter** and **MLP networks** mapping symptoms to diseases via **Neo4J**; 1st among 98 teams.*[Link]*
- **Winner – vesAIthon (2019):** Created **Care4U**, an AI-driven elderly healthcare app with fall detection, mood recognition, and chatbot; later acquired by Govt. of West Bengal.*[Link]*
- **Other Achievements:** Runners-up at **Smart India Hackathon** (2020); Finalist among 1400+ teams at **NEC AI for Transportation** Hackathon (2021); Finalist in 5+ national AI hackathons focused on social good and automation.*[Link]*