

ADITYA ROY CHOWDHURY

📍 Los Angeles, California 📞 (213) 675-0339 ✉ rcaditya10@gmail.com 🌐 [linkedin.com/in/adityaroy12](https://www.linkedin.com/in/adityaroy12)

Summary

Machine Learning Engineer and MS CS student at USC specializing in model compression, multimodal systems, and ML deployment. Experienced in building production-oriented ML pipelines across vision, language models, and embedded platforms, with strong foundations in Python and C++ systems engineering.

Education

University of Southern California

Master of Science in Computer Science, GPA:3.83/4

Aug 2024 – May 2026

Los Angeles, California, USA

Relevant Coursework: ML for Data Science, Advanced Computer Vision, Software Engineering

Thapar Institute of Engineering Technology

Bachelor of Engineering in Computer Science and Engineering, GPA:9.33/10

Aug 2020 – June 2024

Patiala, Punjab, India

Relevant Coursework: Quantum Computing, Artificial Intelligence, Machine Learning

Technical Skills

Languages: Python, C++, C, Matlab, R, SQL, SQLite, HTML, CSS

Technologies/Frameworks: PyTorch, Tensorflow, OpenCV, Flask, Linux, Git, GCP, AWS, Docker, Pandas, CUDA

Experience

ICTP (International Centre for Theoretical Physics)

Feb 2024 – Apr 2024

Machine Learning Engineer Intern

Trieste, Italy

- Developed a **Keras/TensorFlow** object detection pipeline for adverse visibility conditions, utilizing knowledge distillation to compress **SpineNet 49S** backbone by **50%** by maximizing SSIM.
- Enabled FPGA deployment by porting **Python** model inference logic to **C++/HLS** with **Vivado**, generating hardware-synthesizable code.
- Collaborated with stakeholders to produce **10K LOC** of Python/C++, building models and reusable tooling to streamline data processing and model evaluation.

Thapar Institute of Engineering Technology

Jun 2023 – Jul 2023

Machine Learning Research Intern

Patiala, Punjab, India

- Led a **3-person** engineering team through Agile sprints to build a full-stack health monitoring system, coordinating integration of a **Flask** backend with a responsive **HTML/CSS** frontend for real-time visualization.
- Mitigated severe class imbalance in arrhythmia classification by constructing a tailored signal preprocessing pipeline, attaining **0.7 recall** with a **1D ResNet**.
- Ensured instant notification for critical cardiac events while minimizing false positives by engineering a hybrid alerting mechanism that combines ML predictions with static vital thresholds.

Projects

Findly: Privacy-First RAG Agent | [Link](#) |

- Architected a RAG pipeline with a dual-indexing backend to separate text (384d) and image (512d) vector spaces using **FAISS** and **SQLite**, achieving a **4.33ms** mean search latency over 10K queries for CPU-only inference.
- Constructed a synchronization pipeline using **SHA256** file signatures and thread-safe locking to ensure index integrity, maintaining a **42.27ms/file** indexing throughput.
- Verified a memory-efficient core and currently undergoing integration of **Sentence Transformers** and **CLIP** to replace mock embeddings.

CodeMaya: CGI Assistant | [Link](#) |

- Spearheaded development of two-stage training pipeline, cascading Supervised Fine-Tuning with a multimodal alignment phase to train LLM to convert natural language prompts into executable scripts for 3D Renders.
- Specialized **CodeLlama-7B** for domain-specific syntax by **LoRA** fine-tuning on scraped documentation and code, resulting in **92%** syntax validity.
- Distilled semantic knowledge from **CLIP** to align generated 3D renders with text prompts by integrating a visual feedback loop based on **Contrastive Loss**, yielding **91%** structural similarity.

Forecasting Parkinson's Progression | [Link](#) |

- Modeled non-linear disease trajectories to predict Parkinson's progression by devising an ML pipeline on a longitudinal dataset of **237 subjects**.
- Demonstrated a cost-effective alternative to complex biomarker screening by delivering **0.57 MSE** on purely non-invasive features (UPDRS scores).
- Validated findings by publishing research paper in **Springer Lecture Notes in Computer Science**.