Aditya Kumar Choudhary

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Education

Indian Institute of Technology Bombay (IIT Bombay) **Oct. 2023 – Oct. 2026**
Bachelor of Technology (B.Tech) in Metallurgical Engineering and Materials Science *Mumbai, India*

Technical Skills

Languages & Databases: Python, C/C++, Java, R, SQL (PostgreSQL, MySQL), MATLAB
GenAI & NLP: LLMs, Retrieval-Augmented Generation (RAG), LangChain, LangGraph, Hugging Face, Prompt Engineering
Computer Vision : OpenCV, MediaPipe, CNNs (ResNet-18), ConvLSTM, Optical Flow
Machine Learning & Data Science : PyTorch, TensorFlow, Keras, scikit-learn, Pandas, NumPy, PySpark, Time-Series Modeling
Cloud, DevOps & MLOps : Docker, Kubernetes, Bash, Model Deployment, Version & Experiment Tracking, Inference Pipelines
Frontend, Visualization & 3D: React, TypeScript, Vue.js, GSAP, Three.js, Power BI, Data Visualization, Blender, Maya

Experience

Experiqs Pvt. Ltd. (IIT Bombay) **Mumbai, India**
Research Intern (Data Scientist & ML Engineer) *Apr. 2025 – Present*

- **Co-founded and scaled** an end-to-end renewable energy forecasting platform, leading a **cross-functional team of 10** across R&D, product engineering, and operations from ideation to production deployment.
- Designed and deployed **hyperlocal solar and wind forecasting systems** with up to **98% accuracy**, supporting large-scale energy scheduling for enterprise clients including **Tata Power, Sprng Energy, and ReNew Power**
- Built **spatiotemporal ML pipelines** and optimization workflows, improving forecast robustness by **20% during high atmospheric volatility and ramp events**.
- Architected **production-grade real-time** data pipelines for **terabyte-scale climate and radar datasets**, enabling low-latency inference and continuous retraining.
- Developed **radar-based nowcasting models** (U-Net variants) for **15-minute interval predictions**, achieving a **15% uplift in short-horizon accuracy** over baseline NWP models.
- Delivered measurable business impact by **reducing DSM penalties**, contributing to **3% net revenue protection** for renewable energy operators through improved scheduling intelligence.
- Created **operational temperature forecasting models** for **40+ urban stations in Mumbai (90%+ accuracy)**, supporting government-level infrastructure and railway planning use cases.

Projects

R.A.G. Document QA System | *LLMs, LangChain, HuggingFace Embeddings, ChromaDB, Streamlit* **Jan 2026**

- Built a **document-level question answering system** using Retrieval-Augmented Generation (RAG), enabling context-grounded responses over uploaded PDFs and text files.
- Implemented **document ingestion, recursive chunking, and dense embedding pipelines** using HuggingFace embeddings and Chroma vector store for efficient semantic retrieval.
- Designed a conversational retrieval workflow using LangChain, reducing LLM hallucinations by conditioning outputs on retrieved evidence.
- Integrated a **locally hosted LLM (Ollama)** with a Streamlit interface, maintaining session-level memory for chat history and document context.

National Geo-AI Hackathon Winner (IIT Bombay) | *TensorFlow, Random Forest, LiDAR, GIS, Hydrology* **Dec 2025**

- Built an **end-to-end AI/ML pipeline** for processing drone-based **LiDAR point clouds**, performing ground/non-ground classification to generate high-resolution **Digital Terrain Models (DTM)** for rural settlements.
- Engineered a **feature-rich point-level classifier** using spatial geometry, height statistics, RGB values, and neighborhood features, achieving **91% overall accuracy** on large-scale village datasets.
- Conducted **hydrological analysis** on generated DTMs (sink filling, flow direction, flow accumulation, HAND) to identify **waterlogging hotspots** and natural drainage paths.
- Designed **GIS-ready drainage network outputs** scalable across multiple villages, aligning with **SVAMITVA scheme** requirements and government planning workflows.

India-Wide Satellite Nowcasting System | *TensorFlow, ConvLSTM, Xarray, Optical Flow* **Oct 2025**

- Developed and deployed a deep learning pipeline for real-time cloud cover prediction using **ConvLSTM-UNet** architecture, processing 6 spectral bands (IR/VIS) from satellite data.
- Implemented cubic temporal interpolation to upsample 15-min captures to 5-min intervals and engineered a 10-hour rolling forecasting module.
- Integrated **Optical Flow (Lucas-Kanade)** to capture atmospheric motion vectors, significantly improving prediction accuracy in high-convection scenarios.

Certifications

- Coursera (Deeplearning.ai): Machine and Deep Learning Specialization
- Data Structure and Algorithms – IIT Bombay