Dipayan Dasgupta — CE24B059
INDIAN INSTITUTE OF TECHNOLOGY MADRAS
ce24b059@smail.iitm.ac.in • LinkedIn • GitHub • 8928315649

ACADEMIC BACKGROUND

PROGRAM	INSTITUTE	SCORE/%	COMPLETION
B. Tech Civil Engg.	IIT Madras	*7.46 CGPA*	2028
Class XII (CBSE)	Rahul Intl. School, Thane	91.20 %	2024
Class X (ICSE)	Bombay Scottish School, Powai	96.67 %	2022

SCHOLASTIC ACHIEVEMENTS & COMPETITIONS

- **Finalist (Top 10)**: KDSH 2026 Hackathon (Track: Systems Reasoning with NLP & GenAI).
- Goldman Sachs Hackathon 2025: **AIR 5** | WorldQuant BRAIN 2025: **National Finals** | Appian Tech @ IITM: **Rank 9**.
- IMC Prosperity-2025: **Global Rank 66**, India Rank 9 (12,000+ teams) | JEE Adv 2024: **AIR 5672** | BITSAT: **323**.
- Codeforces: **Specialist** (Max 1600) | IICPC Merit Certificate (AIR 440).

COURSES AND SKILLS

Relevant Courses
- Deep Learning (Structuring, Tuning, Optimization); Supervised ML; RL Fundamentals
- LLMOps & Agentic RAG Development; Backend Dev; DSA (C++)

Technical Skills
- **Languages:** Python, C++, JS, Dart, Rust, SQL, NoSQL (MongoDB, PostgreSQL)
- **AI/ML:** PyTorch, TensorFlow, LangChain, LangGraph, RAG, ChromaDB, FAISS, Scikit-Learn
- **LLM:** Gemini, OpenAI, Groq, ElevenLabs, D-ID, Whisper, Parler-TTS, Prompt Eng.
- **Backend:** FastAPI, Flask, Node.js, Celery, Redis, Docker, REST APIs, Streamlit
- **Tools:** Git, Linux, Playwright, Selenium, Scrapy, spaCy, OCR, OpenCV

MAJOR AI/ML PROJECTS

Turia Labs: Sovereign Supply Chain Intelligence (Feb 2026 - Present)
- **Founder & Lead Architect** of an end-to-end platform generating "physical alpha" by analyzing maritime data to predict market movements 24-72 hours before news headlines.
- Built a robust data pipeline with Playwright/HTTPX to scrape unstructured data (HTML, PDF, Excel) from 7 major Indian ports, handling anti-bot measures.
- Implemented an agentic AI system using LangGraph and Gemini 2.5 to autonomously investigate supply chain anomalies, correlate vessel data with news, and generate actionable trading signals.
- Developed the full stack: FastAPI backend with SQLAlchemy, async job scheduler, and a Next.js frontend with Recharts for a real-time intelligence dashboard.

AI Narrative Consistency Checker (KDSH 2026 Finalist) (Jan 2025)
- Built multi-agent RAG system with adversarial "Prosecutor vs. Defender" architecture to verify narrative consistency across 100k+ word novels.
- Implemented real-time ingestion using Pathway VectorStoreServer with semantic chunking (400 tokens) and Gemini text-embedding-004.
- Designed intelligent verdict system: Prosecutor finds contradictions while Defender checks plausibility, achieving high accuracy on long-context reasoning.
- Tech Stack: Pathway, Google Gemini 2.5 Flash, Python, RAG pipelines with top-k=10 retrieval for high recall.

Shaastra 2025 Multimodal RAG Chatbot (Dec 2024 - Jan 2025)
- Developed local-first AI chatbot with full voice interaction (Faster-Whisper STT, Parler-TTS with Indian accent) for Shaastra 2025 event queries.
- Implemented Agentic RAG using LangGraph state machine for intelligent query routing, rewriting, and retrieval with conversation context memory.
- Built hybrid search combining semantic vector search (ChromaDB) with Knowledge Graph (NetworkX) for precise fact retrieval.
- Optimized for consumer hardware (6GB VRAM): quantized Llama 3.2 3B (4-bit), CPU-offloaded STT, CUDA cache management. FastAPI + Streamlit architecture.

AI-Powered Portfolio Optimizer & Backtesting Engine (Nov 2024 - Jan 2025)
- Built professional-grade quantitative investment platform with ML-driven strategy (LightGBM), walk-forward backtesting, and Hierarchical Risk Parity rebalancing.
- Integrated Celery + Redis for asynchronous ML predictions and backtests; generated 30+ KPIs (Sharpe, Sortino, Calmar) with QuantStats and Plotly.js.
- Implemented Indian market Fama-French 4-factor analysis and Google Gemini integration for AI-powered natural language performance summaries.
- Local SQLite database with yfinance data ingestion; comprehensive reporting with equity curves, drawdowns, and risk concentration via hierarchical clustering.

AI Portfolio Agent (Real-Time Market Analysis) (Dec 2024 - Jan 2025)
- Developed multi-page Streamlit dashboard for live Indian market tracking (Nifty 50, Sensex, IT, Banking, FMCG) with real-time price data and AI summaries.
- Built interactive AI agent: creates optimal portfolios based on risk profiles, conducts sector research, runs DRL trading simulations (OpenAI Gym + TensorFlow).
- Implemented portfolio optimization (Sharpe Ratio, Min Variance), risk calculations (Beta, VaR, CVaR), and quantitative stock screener with SQLite caching.
- Tech Stack: Streamlit, yfinance, Google Gemini, Finnhub API, TensorFlow, OpenAI Gym, SQLite with graceful API fallbacks.

Sectoral News Analyzer & Custom Web Scraper (Jun 2025)
- Built custom web scraping pipeline using Scrapy + Playwright for Indian financial news (Moneycontrol), handling JS-heavy sites with direct source targeting.
- Implemented dual sentiment analysis: VADER for quick lexical scoring and Gemini for deep contextual analysis with risk identification and theme extraction.
- Created Flask web UI with Chart.js visualizations for daily sentiment trends, date-range analysis, and on-demand scraping triggers. SQLite news corpus.

AI Cricket Commentary Video Generator (Apr 2025 - May 2025)
- Automated broadcast-quality video generation: Flask frontend for player/match selection, Gemini AI for analytical script generation with custom match analysis.
- Integrated D-ID API for AI presenter (lip-sync), ElevenLabs voice cloning, and MoviePy composition with rembg background removal and Playwright chart animations.
- Built RESTful FastAPI backend serving cricket data from local SQLite (SQLAlchemy ORM), enabling match-specific and career summary video generation.

InstiSpace SMAIL Email Classifier (Webops Club) (Jun 2025)
- Developed email classifier using Groq LLM (Llama3-8B) with Dockerized PostgreSQL and Gmail API for SMAIL processing.
- Built Flask UI and CLI for processing emails with ad-hoc text classification, storing results in DB. Integrated with campus email infrastructure.

POSITIONS OF RESPONSIBILITY

Onsite Intern @ ICICI AMC Prudential (Jun 2025 - Present)
- Portfolio optimization using ML and LLM-based news sentiment analysis for trading signals.

Remote Intern @ Everyst Group (Quant Research) (Jan 2025 - Mar 2025)
- Conducted quantitative securities research and analysis for trading strategies and portfolio management.

MLOps Developer @ Shaastra 2026 | Webops Club IITM (May 2025 - Present)
- Building LLM-integrated chatbot for Shaastra Portal. SMAIL email classifier (Groq LLM, PostgreSQL).

Quant Guild & Software Dev Guild, CFI, IITM (Sep 2024 - May 2025)
- Inter-IIT training: Quant Finance (1/7 freshmen), Full-stack (React, Node.js, MongoDB). Deputy Coord (Rust Dev, Programming Club).

Inter IIT Quant Contingent (Non-Travelling) (Oct 2025 – Dec 2025)
- Worked on Ebullient Securities Inter IIT Quant problem: exhaustive data analysis, trading algorithm development, regime classification, feature engineering & correlation analysis of price/momentum/volatility/volume features.

EXTRA-CURRICULAR ACTIVITIES

- **CP:** Codeforces Specialist (Max 1600); Shaastra Contest 2025 (Global Rank 29) | **Hackathons:** DB Buildathon, KGP DS, Mando (RAG).
- **Leadership:** Floor Rep @ Mandakini Hostel (200 students); hostel website (mandaknight.in) | **NSS:** ISL dataset (125 videos).