Deepayan Basu

Roll No:B21MT016
B.Tech
Materials Engineering
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Summary

Aspiring **Data Scientist** and **AI Engineer** (B.Tech, IIT Jodhpur, 2025) with hands-on experience in **machine learning**, **predictive modeling**, and **LLM-based systems**. Skilled in designing scalable backends (FastAPI, Docker), building **NLP** pipelines (LangChain, FinBERT), and deploying full-stack AI solutions. Adept at extracting insights from unstructured financial and scientific data with a focus on **MLOps**, **RAG**, and knowledge graphs.

Education

Degree / Certificate	Institute / Board	CGPA / %	Duration
B.Tech. (MT)	Indian Institute of Technology, Jodhpur	7.48 / 10	Jul 2021 – May 2025
Senior Secondary	South Point High School (CBSE)	94%	Apr 2019 – Mar 2021
Secondary	South Point High School (CBSE)	96%	Apr 2017 – Mar 2019

Technical Skills

Programming & ML: Python, SQL, Scikit-learn, TensorFlow, PyCaret, Statsmodels
NLP/LLMs: LangChain, FAISS, FinBERT, nomic-embed-text, Ollama
Data & Deployment: Matplotlib, Plotly, Power BI, FastAPI, Flask, Streamlit, Docker, GitHub Actions

Relevant Coursework

- Pattern Recognition and Machine Learning || ML for Economics || AI for Fintech || Financial Analytics

Experience

- **Scientific Investing** *Nov 2024 – Feb 2025*
  LLM Intern
  - Developed a PDF-based financial QA system using **LangChain**, **PyMuPDF**, **FinBERT**, and **ChromaDB**, achieving a **40%+ improvement in answer relevance** across **5+ quarters** of earnings data using customized RAG with **nomic-embed-text**; deployed on an **MCP server** with 2x faster response time.
  - Integrated a knowledge graph pipeline with **Neo4j** to model relationships between **financial entities, sentiments, and timelines**, enabling **relational question answering** with **30% higher entity accuracy** and scalable insights over **1000+ financial nodes**.

- **DRDO, Defence Laboratory, Ministry of Defence, Govt. of India** *May 2024 – Jul 2024*
  Research and Development Intern Github
  - Modeled **Radar Absorbing Materials (RAM)**, achieving a **30%** reduction in radar cross-section (RCS) for stealth fighter applications.
  - Designed a dual-branch CNN (**J-CNN**) with Task-Driven Pruning for SAR target classification, achieving **94% accuracy** and **23% faster** inference on the MSTAR dataset as an added extended research and learning project.

Projects

- **Credit Risk & Model Governance Dashboard** *Jul 2024 – Sep 2024*
  FinTech + MLOps GitHub | Dashboard
  - **Architected** an interactive **Streamlit** dashboard with an **XGBoost** core to predict credit default and monitor model health using stability metrics like **PSI**, **CSI**, and the **KS-statistic**.
  - Processed **30k+** client records and integrated advanced governance features like **SHAP** explainability and **fairness audits**; achieved a **Gini of 0.52** and enabled business impact simulations that linked model performance directly to financial KPIs.

- **Conference Call Sentiment Analysis Tool** *Oct 2024 – Nov 2024*
  AI for Fintech | Faculty: Saurabh Kumar, IIT Jodhpur GitHub | Dashboard
  - Built a sentiment analysis pipeline using **VADER** and **Afinn** on **10+** earnings calls; found a **73%** match between sentiment shifts and post-call stock movements.
  - Processed **50+** financial transcripts from PDF/Excel using **PyPDF2** and **Pandas**; tokenized text with **NLTK** and extracted normalized vectors for quarter-over-quarter sentiment comparison.

- **Causal ML for Travel App Participation** *Sept 2024 – Dec 2024*
  Applied Economics, IIT Jodhpur | Under Dr. Dweepobotee Brahma Project Report
  - Applied Causal Trees and Causal Forests to estimate Conditional Average Treatment Effects (**CATE**) across **600+** users in a travel survey.
  - Identified high reward-responsiveness (**+3.36 CATE**) in the **14–20** age group, enabling targeted app engagement strategies.

- **Lankford Coefficient Prediction** *Jan 2024 – Mar 2024*
  Metallurgy + Deep Learning GitHub
  - Implemented a **CNN** model to predict Lankford coefficients (**r0**, **r45**, **r90**) from Orientation Distribution Function (**ODF**) images of sheet metals.
  - Preprocessed **10k+** ODF image segments; achieved **R^2 scores** of 0.89, 0.92, and 0.94 respectively, reducing prediction time by **80%** over experimental methods.

FEATURED PROJECT

AgriIntel – AI Assistant for Indian Farmers *GitHub Link*
Full-Stack AI/ML Platform | NLP | MLOps | Independent Project July 2025 – Present
- Built a multilingual AI assistant (FastAPI, LangChain, LLaMA3) serving real-time crop and mandi insights to 50M+ Indian farmers.
- Engineered a knowledge graph for entities and events to enable relational queries and context-aware RAG using FAISS + `nomic-embed-text`.
- Deployed on MCP server with optimized Dockerized backend; achieved low-latency inference and robust offline-first support.
- Designed a mobile-first frontend (Tailwind, HTML) and automated CI/CD with GitHub Actions for scalable rollout.

POSITIONS OF RESPONSIBILITY

- **Mentor & Core Team Member,** Sangam Music Society, IIT Jodhpur *Jul 2022 – Apr 2025*
  - Led music production and coordinated 10+ cultural events and inter-college shows as a multi-instrumentalist.
  - Managed logistics for performances, liaising with sound engineers, venue staff, and performers.

- **Assistant Head,** UDBHAAS 2022, IIT Jodhpur (JCKIF) *Nov 2022*
  - Orchestrated logistics for a national art exhibition with 500+ attendees, inaugurated by Hon'ble Union Minister G.S. Shekhawat.
  - Oversaw media, hospitality, and volunteer operations for a successful high-profile event.

ACHIEVEMENTS, CERTIFICATIONS & LANGUAGES

- **1st Place** – NIFT National Cultural Fest Band Competition (2024)

- **3rd Place** – IGNUS Band Competition, IIT Jodhpur (2025)

- Multiple school-level awards in **football**, **track**, and athletics

- **JLPT N4** – Japanese Language Proficiency (Intermediate)

- **Languages:** English, Hindi, Bengali (Fluent); Japanese (JLPT N4)