

DHRUV MENDIRATTA



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AI Engineer | LLMs & RAG Systems | Full-Stack Developer |

SUMMARY

Final-year Computer Science student with hands-on experience developing Retrieval-Augmented Generation (RAG) AI systems during a Generative AI internship at EY, leveraging tools like LangChain, FAISS, and Gemini APIs. Strong foundation in cloud computing through an AWS-focused internship at Deloitte, optimizing deployments using EC2, S3, and Lambda. Published researcher in applied deep learning, with contributions in CNN, GAN, and hybrid LSTM-GRU models for finance and medical imaging. Skilled in building full-stack AI products using Python, FastAPI, React, and PostgreSQL. Passionate about developing scalable, human-aligned AI solutions that bridge research and real-world impact.

EXPERIENCE

- **Ernst & Young (EY)**  May 2025 - Present
AI Intern – Generative AI & RAG Systems Delhi, India
 - Developed RAG-based enterprise AI chatbots using LangChain, FAISS, and Gemini APIs to enhance internal knowledge retrieval workflows.
 - Designed and optimized LLM pipelines integrated with proprietary document stores, improving response relevance and latency.
 - Built scalable ingestion systems with chunking strategies and efficient embedding models to improve contextual accuracy by 30
 - Collaborated cross-functionally to implement prompt engineering, vector store tuning, and pipeline deployment using modular workflows.
 - Contributed to internal automation tools focused on knowledge access and compliance documentation.
- **Deloitte Touche Tohmatsu India LLP**  May 2024 – Jul 2024
Software Engineering Intern – Cloud Computing (AWS) Gurugram, India
 - Completed an intensive internship focused on cloud computing fundamentals and AWS services including EC2, S3, and Lambda.
 - Participated in the development of cloud-based solutions with guidance from senior engineers, gaining exposure to deployment workflows and infrastructure design.
 - Learned best practices in cloud architecture, cost optimization, and real-time monitoring.
 - Contributed to internal documentation and knowledge-sharing sessions around DevOps tooling and AWS ecosystem.
 - Developed adaptability, communication, and teamwork skills in a fast-paced, professional environment.

EDUCATION

- **Manipal University Jaipur** Sep 2022 - Present (Expected Graduation: 2026)
B.Tech in Computer Science and Engineering Jaipur, India
 - **Relevant Coursework:** Data Structures & Algorithms, Machine Learning, Artificial Intelligence, Cloud Computing, Database Systems, Operating Systems
 - **Achievements:**
 - Student Excellence Award for outstanding overall performance (5th semester & 6th semester)
 - Active Member – Google Developer Student Club (GDSC) – AI/ML & Full Stack Domains
 - Published 3 AI-focused research papers (Deep Learning, RAG Systems, Stock Forecasting)
- **The Vivekanand School** July 2022
Class XII Delhi, India
- **Somerville School Noida** July 2020
Class X Noida, India

PROJECTS

• Enterprise RAG Chatbot:

May 2025 - July 2025

Tech Stack: [LangChain, FAISS, Gemini APIs, Python, LLMs]



- Developed an internal enterprise chatbot using Retrieval-Augmented Generation (RAG) techniques for efficient document retrieval and question answering.
- Integrated vector search (FAISS) with Gemini APIs and LangChain pipelines for improved contextual accuracy.
- Contributed to prompt engineering, document chunking, and embedding optimization, leading to a 30% gain in response relevance.

• Hybrid Stock Price Prediction – LSTM + GARCH

Jan 2025

Tools: [Python, TensorFlow, Keras, Pandas, ARCH, Matplotlib]



- Designed a hybrid model combining LSTM (time-series) and GARCH (volatility modeling) for S&P 500 data forecasting.
- Achieved high prediction accuracy ($R^2 = 0.9901$, RMSE = 0.0125) and submitted findings for academic publication.
- Conducted feature engineering, cross-validation, and error analysis using visualization tools.

• Product Sentiment Analyzer (Full-Stack NLP App)

March 2025

Tools: [FastAPI, React, NLTK, PostgreSQL, Chart.js]



- Designed and implemented a custom sentiment analysis algorithm using NLTK, capable of classifying product reviews into positive, neutral, and negative categories.
- Built and deployed a FastAPI backend for processing and analyzing user-submitted reviews in real-time.
- Developed a responsive React frontend with dynamic graphs and visual sentiment indicators for improved UX.
- Implemented keyphrase extraction to highlight core customer feedback themes.
- Integrated PostgreSQL for data storage and created preprocessing pipelines for structured review datasets.

• Railway Ticketing Chatbot (Rule-Based NLP)

May 2025

Tools: [Python, NLTK]



- Built a rule-based chatbot simulating a train ticket booking flow using keyword mapping and intent matching.
- Designed a text interface and input validation pipeline for a streamlined booking simulation..
- Applied early NLP techniques to classify queries and respond contextually.

PUBLICATIONS

C=CONFERENCE, J=JOURNAL, P=PATENT, S=IN SUBMISSION, T=THESIS

- [C.1] Dhruv Mendiratta, et al. (2025). **Skin Disease Detection using Deep Learning: A Comparative Analysis of CNN Models on the ISIC Dataset**. In *2nd International Conference on Computing and Machine Learning (CML 2025)*, Sikkim Manipal University

- Designed a hybrid model combining CNN, GAN, and XGBoost to classify skin diseases from dermoscopic images.
- Achieved 96.3% accuracy, outperforming EfficientNet and ResNet; used Grad-CAM and saliency maps for interpretability.

- [C.2] Dhruv Mendiratta, et al. (2025). **Enhanced Stock Market Forecasting Using Hybrid BiLSTM-GRU Models**. In *ICAESRTA – 2K25*, Karmaveer Bhaurao Patil College of Engineering

- Developed a hybrid deep learning model for S&P 500 stock prediction, integrating BiLSTM and GRU architectures.
- Achieved $R^2 = 0.9901$, MAE = 0.0101, and RMSE = 0.0125 using rigorous preprocessing and cross-validation.

- [J.1] Aryan Gupta, Dhruv Mendiratta, Author 3, et al. (Year). **Driving Medical Diagnostics Forward: The Role of AI in Innovation and Implementation**. *Cuestiones de Fisioterapia*, Vol. 52, Issue 2, pp. 155-184. DOI: Cuest.fisioter.2025.54(2):155-184

- Reviewed the role of AI in radiology, dermatology, and pathology, with focus on diagnostic accuracy, clinical integration, and ethical challenges..
- Explored applications of AI-driven image analysis, disease classification, and workflow automation in healthcare systems.

SKILLS

- **Programming Languages:** Python, C, SQL, HTML, CSS, JavaScript
- **Data Science Analysis:** NumPy, Pandas, Matplotlib, Seaborn, GARCH, ARCH, Feature Engineering, Model Evaluation (R^2 , RMSE, MAE), Grad-CAM
- **Database Systems:** PostgreSQL, MySQL, MongoDB
- **Data Science & Machine Learning:** Scikit-learn, TensorFlow, Keras, CNN, LSTM, BiLSTM-GRU, GANs, XGBoost
- **Cloud Technologies:** AWS (EC2, S3, Lambda), Gemini APIs, Cloud Architecture Optimization
- **DevOps & Version Control:** Git, GitHub, CI/CD Basics, Jenkins, VS Code
- **Specialized Area:** LLMs, LangChain, Retrieval-Augmented Generation (RAG), Prompt Engineering, FAISS
- **Mathematical & Statistical Tools:** ARCH/GARCH models, Time Series Analysis, Probability & Stats, Regression Analysis, Statistical Inference
- **Other Tools & Technologies:** FastAPI, React, Node.js, Chart.js, PowerBI, REST APIs
- **Research Skills:** Comparative Model Evaluation, Academic Writing, Dataset Curation, Paper Presentation, Literature Review, Explainability Techniques

HONORS AND AWARDS

- **Student Excellence Award** Sept 2024
Manipal University Jaipur
 - Awarded for learning and contribution during the AWS-focused internship at Deloitte Touche Tohmatsu LLP
- **Student Excellence Award – Research Recognition (2025)** May 2025
Manipal University Jaipur
 - Honored by university for publishing peer-reviewed research on AI-driven medical diagnostics in an international journal
- **HACKX Hackathon – Round 2 (2024)** 2024
HACKX, Manipal University Jaipur
 - Advanced to the final round of a university-level hackathon hosted by Manipal University Jaipur
- **Paper Presentation – CML 2025, Sikkim Manipal University** 2025
Sikkim Manipal University
 - Presented research paper on Skin Disease Detection using Deep Learning
- **Paper Presentation – ICAESRTA 2K25, KBP College of Engineering** June 2025
KBP College of Engineering
 - Presented research on hybrid stock forecasting using BiLSTM-GRU models

CERTIFICATIONS

- **Deloitte:** Internship Certificate – Cloud Computing & AWS (EC2, S3, Lambda)
- **NPTEL – Design & Analysis of Algorithms (SWAYAM, Govt. of India)** Month Year
- **Oracle:** Java Foundations
- **AWS Academy:** Cloud Foundations
- **Cisco :** Certified Cybersecurity Specialist
- **IBM:** Getting Started with Enterprise AI
- **Vanderbilt University:** MATLAB for Data, Signal & Image Analysis

ADDITIONAL INFORMATION

Languages: English (Fluent), Hindi (Native)
Interests: Generative AI, Research Writing, Financial Markets, Technology Blogging, Building AI Bots