

QUAMRUL HODA

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EDUCATION

I K Gujral Punjab Technical University

B.Tech - Computer Science and Engineering (AI/ML) | CGPA: 7.1/10

2023 – Present
Kapurthala, Punjab

EXPERIENCE

CodeAlpha

1st – 30th July 2025

Machine Learning Intern

Remote

- Designed and deployed a **Restaurant Price Prediction** system using supervised ML algorithms, building an end-to-end **retrieval and evaluation pipeline** for structured output and model reliability.
- Applied **CatBoost** and **anomaly detection** to handle high-cardinality features and identify outliers, improving **system correctness** and prediction robustness.
- Built full **ML pipeline** using **Python**, **Scikit-learn**, and **Pandas** covering data ingestion, feature engineering, model training, and **evaluation frameworks**.

TECHNICAL SKILLS

Languages & Async: Python, async programming, SQL

AI & NLP: Transformer Architecture, NLP, LLMs, Prompt Engineering, Embeddings, RAG Systems, Vector Databases (FAISS, Pinecone, Chroma), LLM Evaluation, Fine-Tuning

Agentic & Multi-Agent AI: LangChain, LangGraph, Agentic Workflows, Context Engineering, Multi-Agent Systems, OpenAI API

MLOps & Tools: FastAPI, PostgreSQL, Docker, MLflow, DVC, Git, GitHub, CI/CD Pipelines, Redis, MongoDB, Unit Testing, Integration Testing

ML/DL Frameworks: Scikit-learn, TensorFlow/Keras, PyTorch, XGBoost, LightGBM, CatBoost, YOLO, HuggingFace Transformers, Anomaly Detection

PROJECTS

AI Chatbot – RAG-Based Multi-Agent System (LangGraph + FastAPI + React)

- Architected a **production-grade agentic AI chatbot** using **LangGraph** with **multi-agent workflows**, **context engineering**, and thread-level session management via **MongoDB**.
- Designed and evaluated a **RAG-based retrieval pipeline** using **FAISS vector store** and **OpenAI API** with **semantic search** and **structured output handling**, reducing irrelevant outputs by **40%**.
- Implemented **LLM evaluation frameworks** to measure response correctness, detect **hallucinations**, and ensure **system reliability** across multi-turn conversations.
- Built **async FastAPI** backend with **PostgreSQL** and **streaming responses**, integrated **CI/CD pipeline** via GitHub Actions for automated testing and deployment.

YouTube Comment Analysis – NLP & Evaluation Pipeline

- Built an **NLP-powered** real-time comment analysis system using **BERT Transformer architecture** with **prompt engineering** and **embedding-based** classification, achieving **98% accuracy**.
- Developed **evaluation frameworks** for sentiment and toxicity classification, addressing **structured output handling** and model correctness at scale.
- Fine-tuned **HuggingFace Transformers** on domain-specific data, improving model performance by **12%** over the pre-trained baseline with rigorous **integration testing**.
- Deployed **FastAPI** inference backend with **CI/CD via GitHub Actions**, achieving **sub-second real-time** response on live data streams.

Kidney Disease Classification – Deep Learning Research

- Conducted **AI research** on medical image classification using **CNN** with **VGG16 transfer learning**, achieving **88% diagnostic accuracy** on clinical datasets.
- Engineered modular **MLOps pipeline** with **unit-tested** stages for data ingestion, augmentation, training, and evaluation using **TensorFlow/Keras**.
- Applied augmentation strategies to address **class imbalance**, reducing **false-negative rate** and improving model reliability for real-world clinical workflows.

CERTIFICATIONS

- Data Science with Generative AI – PwSkills
- Agentic AI using Agno – CampusX
- Advanced RAG – CampusX