

# Nihal Agarwal

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## PROFESSIONAL SUMMARY

Machine Learning Engineer with hands-on experience building recommendation systems, demand forecasting pipelines, and LLM-based RAG applications. Strong in Python, machine learning fundamentals, and deploying models via REST APIs. Interested in applied ML and scalable systems.

## TECHNICAL SKILLS

- Programming:** Python, SQL
- Machine Learning:** Recommendation Systems, Time-Series Forecasting, Feature Engineering, Model Evaluation
- Deep Learning:** PyTorch, LSTM
- NLP & LLMs:** RAG, Embeddings, FAISS, Prompt Engineering
- Deployment :** FastAPI, REST APIs
- Tools:** Git, Linux, Jupyter

## PROJECTS

### Scalable E-Commerce Recommendation System |

- Built an end-to-end recommendation system on 1M+ user-item interactions
- Implemented popularity baseline, collaborative filtering, and neural recommender models
- Addressed cold-start users using content-based features and fallback strategies
- Evaluated using Precision@K and NDCG@10, achieving 17% improvement
- Deployed inference pipeline using FastAPI for low-latency recommendations

Tech: Python, Pandas, Scikit-learn, PyTorch, SQL, FastAPI

### Demand Forecasting System for Supply Chain Optimization

- Developed a time-series forecasting pipeline to predict product-level demand
- Analyzed trend, seasonality, and anomalies to improve forecast stability
- Implemented ARIMA, XGBoost, and LSTM models
- Reduced forecasting error by 21% (MAPE) compared to baseline models

Tech: Python, Pandas, Statsmodels, XGBoost, PyTorch

### LLM-Based Internal Knowledge Assistant (RAG System)

- Built a Retrieval-Augmented Generation (RAG) system to answer queries based on internal documents.
- Generated document embeddings using Python and stored them in a FAISS vector database for efficient semantic search.
- Integrated an LLM to synthesize natural language responses based on retrieved context.
- Tech: Python, LangChain, FAISS, OpenAI API, Pandas.

## CERTIFICATIONS & ACHIEVEMENTS

- Rapid Development for AI (AI Services)
- IBM Watson Studio

- IBM

## EDUCATION

### B.Tech in Computer Science

JECRC UNIVERSITY, JAIPUR

2024-2028