

# Muhammad Hamza

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## Work Experience

- **Associate Software Engineer - AI | Purelogics | Sept 2025 – Present**  
*Developing AI-powered solutions using machine learning, deep learning, and integrating into real-world applications with Flask, FAST, and Django.*
- **AI intern | Purelogics | May 2025 – Aug 2025**  
*Completed hands-on training in ML, DL, and NLP, building and deploying AI-powered applications*
- **RPA Developer intern | Arcana Info | Sept 2024 – Dec 2024**  
*Assisted in building RPA bots using UiPath to automate repetitive business tasks.*

## Key Projects

### 1. Test Management System (TMS)

- Currently developing an intelligent Task Management System (TMS) that integrates AI-driven automation for task creation, prioritization, and progress tracking, improving overall team productivity and workflow efficiency.
- Building a modular backend with Django REST Framework and PostgreSQL, featuring secure user authentication, role-based access control, and RESTful APIs for seamless integration with the React-based frontend.
- Implementing AI assistance using LangChain and OpenAI GPT-4o, enabling natural-language interaction for creating tasks, generating summaries, setting deadlines, and suggesting task dependencies dynamically.
- Integrating asynchronous processing with Redis and Celery to handle background tasks such as notification scheduling, report generation, and AI-powered analytics for team performance insights.

### 2. AI-Powered Automated Restaurant System

- Architected an intelligent restaurant management system using FastAPI for high-performance backend APIs, seamlessly integrated with a web interface for both traditional and conversational user interactions.
- Developed an agentic AI chatbot using LangGraph and OpenAI GPT-4o Mini, capable of reasoning over structured and unstructured data to help users explore menu items, filter options by taste, ingredients, or medical conditions (e.g., diabetes), and even order their desired items autonomously.
- Implemented a retrieval-augmented generation (RAG) pipeline leveraging Pinecone vector database and OpenAI text-embedding-3-large, enabling semantic search, contextual query understanding, and personalized menu recommendations.
- Integrated PostgreSQL for structured data storage and designed metadata-aware intelligence (e.g., parking availability, dining capacity, free space), empowering the chatbot to provide accurate, context-rich responses about restaurant logistics and services.

### 3. AI-Based Recruitment System – TalentTorch

- Developed an AI-powered recruitment platform using Django REST Framework that automated candidate–job matching through NLP-based skill extraction and semantic similarity modeling.

- Implemented a RAG-style ranking pipeline using the *BAAI/bge-large-en* embedding model and *Mistral 7B Instruct*, enabling intelligent resume parsing, skill reasoning, and contextual job matching.
- Integrated *MySQL* for structured data storage and designed modular APIs for scalable, real-time candidate search, ranking, and recommendation.

#### 4. Intelligent Codebase Knowledge Assistant

- Developed an intelligent codebase analysis system using Django REST Framework and *Pinecone* vector database, enabling developers to query GitHub and Bitbucket repositories in natural language via semantic search powered by OpenAI *text-embedding-3-small* with *GPT-4o* for paid mode, and *BGE-Large (1024-dim) embeddings* with *LLaMA 3 8B* (running locally via Ollama) for the free mode.
- Designed a dual-provider AI architecture using the Factory design pattern, supporting both OpenAI (paid) and Hugging Face/Ollama (open-source) backends with hybrid chat completion and automatic fallback, improving reliability and reducing LLM token usage.
- Implemented a scalable semantic code search pipeline processing 100+ repositories, featuring batch vector upserts, cosine similarity retrieval, and robust REST APIs with complete error handling and graceful degradation.

## Skills and Tools

- **Machine Learning and Data Science:** Python, SQL, NumPy, Pandas, scikit-learn (Regression, Classification, Clustering, Pipelines), Matplotlib, Seaborn, Regression, Classification, Clustering, Pipelines, Cross-validation, performance metrics, overfitting prevention, Data Preprocessing
- **Deep Learning:** TensorFlow, PyTorch, CNN, ANN, LLM, Fine-tuning, RAG, LangChain, GenAI
- **NLP:** Tokenization, text normalization, stemming, intent classification, Hugging Face Transformers, Prompt Engineering
- **Speech / Audio:** OpenAI Whisper, Vosk STT, SpeechRecognition, PyDub
- **API Integration:** FastAPI, Web API integration, Postman, OpenAI API, FlaskAPI
- **Tools:** Git, GitHub, Bitbucket, VS Code, Jupyter Notebook, Google Colab, Power BI, Cursor, Claude Code, GitHub Copilot
- **Data Visualization and Analytics:** Matplotlib, Seaborn, Power BI
- Bash Scripting

## Education

### Bachelor of Science in Computer Science

COMSATS (2020-24)

## Certifications

1. Python + AI bootcamp | Purelogics
2. [Python | SimpliLearn](#)
3. [Introduction to SQL](#)
4. [Artificial Intelligence Essentials V2 | IBM | Coursera](#)
5. [Generative AI and LLMs: Architecture and Data Preparation](#)
6. [Google Soft Skills Program | Pakistan Freelancers Association](#)