

AYAAN AHMED KHAN

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EDUCATION

ILLINOIS INSTITUTE OF TECHNOLOGY | Chicago, Illinois

Expected May 2026

Bachelor of Science in Artificial Intelligence; **Minor** in Architecture

Relevant Coursework: DSA, AI, ML, NLP, DBMS, Assembly, Data Mining, Discrete Math, Linear Algebra, Probability, Statistics, OOP

SUMMARY

AI engineer and backend developer building production LLM systems, including retrieval augmented generation, semantic search, and multi stage agent workflows. Experienced with asynchronous application programming interfaces, vector databases, Redis caching, job orchestration with retries, real time streaming, and observability.

WORK EXPERIENCE

AI & DIGITAL DEVELOPMENT INTERN | Chicago, Illinois

May 2025 - Present

The Syntec Group

- Built an internal RAG chatbot over firm documents delivering cited, context grounded answers to reduce lookup time and improve response consistency.
- Implemented ingestion & retrieval workflow (chunking/embeddings/indexing) with emphasis on source traceability and hallucination reduction.
- Led an information architecture plus website redesign improving navigation and access to resources; used engagement analysis to iterate content performance.

PROJECTS

CLUTCH | Personal Project

January 2025 - Present

- Built a staging deployed SaaS that generates research backed courses using a multi stage agent pipeline, orchestrating 5 stages with persisted job state, retry policies, and failure isolation to keep long running workflows reliable.
- Implemented an asynchronous FastAPI backend with PostgreSQL plus pgvector and Redis caching, and streamed real time job progress to clients using SSE backed by Redis to keep generation workflows responsive.
- Cut inference cost and improved output quality using LiteLLM routing and shared source deduplication; enforced structured outputs with PydanticAI validation and added observability via Sentry and PostHog.

SYNTEC AI CHATBOT | Professional Project

May 2025 - Present

- Shipped a semantic search and retrieval augmented chatbot using GPT-4o and ChromaDB embeddings to deliver question answering across PDF documents, blog posts, and website content with automated source citations and context aware responses.
- Built a production oriented system with a React user interface and Flask application programming interface, integrated WordPress blog ingestion plus web scraping, and added Redis caching that reduced inference cost by 65%.
- Containerized the service with Docker for consistent deployments and enabled dual internal and client facing usage with security controls and access restrictions.

INVESTOCHAT | Personal Project

October 2025 - Present

- Built a FastAPI service with PostgreSQL plus pgvector that powers a retrieval-augmented investment chatbot over real estate brochures and documents.
- Implemented multi path retrieval with vector search plus SQL fallback and MMR to improve answer reliability.
- Integrating WhatsApp Business lead qualification with Airtable CRM sync, adding rate limiting and PII detection for safer client facing operation.

SENTIMENT ANALYZER | Academic Project

September 2025 - December 2025

- Engineered a machine learning classifier using Logistic Regression with TF-IDF features (1-2 grams) to analyze over 50,000 Amazon fine food reviews, achieving high accuracy through L2 regularization and balanced class weighting on preprocessed text data.
- Built an interactive Streamlit web application with real time sentiment prediction and confidence scoring, implementing complete ML pipeline from data preprocessing (noise removal, text cleaning) to model deployment.

NEUROLEARN | Academic Project

September 2025 - December 2025

- Designed AI driven logic for adaptive learning flow in NeuroLearn, enabling quiz based performance detection and content personalization for neurodivergent learners; structured system behavior to simulate ML integration and ensure future model compatibility.
- Translated conceptual AI components into actionable system design, co-authoring documentation for detection logic and feedback loops that supported intelligent recommendations and user-centered interface behavior across prototype and presentation assets.

TREND ANALYZER FOR RAW MATERIALS | Personal Project

March 2025 - May 2025

- Developed a cotton price forecasting system using Facebook Prophet and external regressors (crude oil, natural gas, soybeans), achieving 19.55% MAPE on 6 month forecasts with 755 days of real commodity futures data.
- Built a time series forecasting model with cross validation that improved 1 year prediction accuracy by 27.9% through multivariate regression analysis of correlated commodity markets (0.77 correlation with oil prices.)

SKILLS

Languages: Python, Java, SQL, JavaScript, R, Bash, C++, Svelte, TypeScript

Backend: FastAPI, Flask, SSE, WebSockets

Data: PostgreSQL, pgvector, Redis, ChromaDB

ML and LLM: RAG, embeddings, LangChain, Hugging Face, scikit-learn, PyTorch, TensorFlow

Infra and Observability: Docker, Git, CI and CD, Sentry, PostHog