

TALHA SHAHZAD

Full Stack Developer & AI Engineer

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PROFESSIONAL SUMMARY

Results-driven Full Stack Developer and AI Engineer with 2+ years of hands-on experience delivering end-to-end solutions across web, mobile, and AI domains. Proven track record building production-grade systems: multimodal RAG chatbots (Flutter + FastAPI + FAISS + Groq LLaMA), IoT drone systems with real-time AI waste detection (ESP32-S3, ResNet50, TensorFlow), retail POS applications, and real estate management platforms. Experienced in full project lifecycle — from hardware firmware through database design, REST APIs, and cross-platform mobile apps.

TECHNICAL SKILLS

Languages	PHP, Python, JavaScript (ES6+), Dart, C#, C++, SQL, Bash, Java
Frameworks	Laravel, React.js, Flutter, FastAPI, Streamlit, ASP.NET / .NET WinForms, Flask
AI / GenAI	RAG (Retrieval-Augmented Generation), LangChain, LLMs, Groq (LLaMA 3.3 70B / LLaMA 4), FAISS Vector DB, HuggingFace Embeddings, ResNet50 (Transfer Learning), TensorFlow / Keras, OCR (Tesseract), Speech-to-Text, gTTS, Prompt Engineering
IoT / Embedded	ESP32-S3 CAM, Arduino IDE, TinyGPS++, MJPEG streaming, GPS (NEO-6M), OpenCV, Leaflet.js
Databases	MySQL, PostgreSQL (PgSQL), Firebase Firestore / Realtime DB, SQL Server (T-SQL), FAISS, SQLite
Cloud & Auth	Firebase (Auth, Firestore, Storage), AWS Fundamentals, Microsoft Azure Fundamentals
Dev Tools	Git, GitHub, VS Code, Visual Studio, Arduino IDE, Linux (Ubuntu), REST APIs, Swagger / OpenAPI
CMS / Other	WordPress, WooCommerce, Elementor, Microsoft Office, Admin Dashboard Design, Provider (Flutter state mgmt), GoRouter
CS Concepts	Data Structures & Algorithms (C++), OOP, MVC, DB Normalization (3NF), RBAC, OWASP Security

WORK EXPERIENCE

Full Stack Web, Mobile App & AI Developer	Freelance / Self-Employed Jan 2024 – Present
- Architected and deployed multimodal RAG chatbot (Flutter + FastAPI + FAISS + Groq LLaMA 3.3 70B + Firebase) supporting PDF, DOCX, PPTX, XLSX, CSV, images (OCR), and MP4 (speech-to-text) — with bilingual voice I/O (English & Urdu), real-time Firestore chat history, and gTTS audio responses. - Built IoT-based AI drone waste detection system: ESP32-S3 CAM firmware (C++, Arduino IDE) + Python Flask server + ResNet50 transfer learning model (TensorFlow/Keras, ~80% accuracy) + GPS geospatial mapping via Leaflet.js — classifying scenes as clean or garbage in real time every 10 frames. - Developed AI voice chatbot (Python, Streamlit, Groq LLaMA 4, FAISS) with RAG pipeline supporting multi-source ingestion: PDF, DOCX, images (OCR via Tesseract), and MP4 (FFmpeg audio transcription) — persistent vector index across sessions. - Designed and delivered 10+ production web applications using PHP, Laravel, React.js, and WordPress following MVC architecture, RBAC, and OWASP security standards. - Built a full-featured retail POS desktop application (C#, WinForms, SQL Server, T-SQL) for a men's clothing store — inventory management, billing engine, and sales reporting dashboard. - Developed Real Estate Rental Management System (C#, SQL Server) with fully 3NF-normalized database schema, lease lifecycle tracking, tenant records, and financial reporting.	

- Built cross-platform mobile applications using Flutter with Firebase backend (Auth, Firestore, Storage) targeting Android and iOS from a single codebase.
- Implemented and optimized relational database schemas (MySQL, PostgreSQL), REST APIs, and admin dashboards; integrated Swagger/OpenAPI documentation for all FastAPI endpoints.

KEY PROJECTS

Multimodal RAG Chatbot — Flutter · FastAPI · Groq LLaMA 3.3 70B · FAISS · Firebase · Python

github.com/MtalhaShzd/rag-chatbot-app

- Full-stack AI assistant (semester project, Mobile App Development) supporting General Knowledge mode and Document-Based Q&A mode with FAISS semantic search and HuggingFace sentence-transformer embeddings.
- Multimodal ingestion: PDF, DOCX, PPTX, XLSX, CSV, images (OCR), and MP4 (speech-to-text); Firebase Auth (email + Google Sign-In); bilingual voice I/O (English/Urdu) via gTTS; dark/light theme; chat history with session grouping, search, and delete. Includes full API documentation (Swagger).
- Architecture: Flutter frontend (Provider + GoRouter) → FastAPI backend → Groq LLM → FAISS retrieval → Firestore storage.

AI Voice Chatbot with RAG (Streamlit + Groq LLaMA 4) — Python · Streamlit · Groq · FAISS · Tesseract OCR · FFmpeg

github.com/MtalhaShzd/ai-rag-voice-chatbot

- Production-grade enterprise RAG chatbot with multi-source ingestion (PDF, DOCX, images via Tesseract OCR, MP4 via FFmpeg audio transcription), persistent FAISS vector index, and voice input/output in English and Urdu.
- Python, powered by Groq LLaMA 4 for ultra-fast inference; includes Full Reset button for index management and secrets-based API key handling via Streamlit config.

IoT AI-Driven Drone Waste Detection & Geospatial Mapping — C++ · Python · ESP32-S3 · TensorFlow · ResNet50 · Flask · OpenCV · Leaflet.js

github.com/MtalhaShzd/IoT-based-AI-Driven-Drone-Waste-Detection-Geospatial-Mapping-System

- 6th semester IoT capstone (team of 4): ESP32-S3 CAM drone streams MJPEG video → Python Flask server applies ResNet50 transfer-learning model (trained on Kaggle clean/dirty dataset, ~80% accuracy) → classifies frames as clean or garbage every 10 frames → GPS coordinates polled every 5 seconds → results plotted on interactive Leaflet.js map with green/red markers.
- Hardware: GOOUUU ESP32-S3-CAM (OV3660), NEO-6M GPS (TinyGPS++ parsing); firmware in C++ (Arduino IDE); Python server in Flask + TensorFlow + OpenCV.

POSApp — Point of Sale Desktop Application — C# · SQL Server (T-SQL) · WinForms · .NET

github.com/MtalhaShzd/POSApp

- Full-featured retail POS for a men's clothing store: product catalog, inventory management, billing engine, and sales reporting dashboard.

Real Estate Rental Management System — C# · SQL Server · WinForms · .NET

github.com/MtalhaShzd/RealEstateRentalManagementSystem

- Comprehensive rental platform: tenant records, lease lifecycle, property portfolio, and financial reporting. Database fully normalized to 3NF with all PK, FK, UNIQUE, CHECK, and NOT NULL constraints enforced.

EDUCATION

B.S. Information Technology (In Progress) Sep 2023 – Present - Expected Graduation Year (2027)

Ghazi University, Dera Ghazi Khan, Punjab, Pakistan

CGPA: 3.95/4.00

Intermediate — Pre-Medical (Biological Sciences) Aug 2019 – Jul 2021

Govt. Graduate College Block 17, Dera Ghazi Khan

Marks: 1081 / 1100 (98.27%)

Matriculation — Biological Sciences Mar 2017 – Feb 2019

Center of Excellence, Govt. Boys High School No. 1, Dera Ghazi Khan

Marks: 1085 / 1100 (98.63%)

CERTIFICATIONS & LICENSES

- AWS Cloud Fundamentals
- Microsoft Azure Fundamentals
- SQL (Structured Query Language)
- Intro to Artificial Intelligence
- Intro to Cybersecurity
- Networking Basics

LANGUAGES

English – Professional Fluency **Urdu** – Native / First Language