

# TANVEER HUSSAIN

## Applied AI Engineer

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## PROFESSIONAL SUMMARY

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Applied AI Engineer with 3+ years building and shipping production AI systems end to end. An electrical engineer who codes, I combine machine learning, LLM and agent systems, and workflow automation with a genuine engineering foundation in systems design, reliability, and hardware control. Top Rated on Upwork with 100+ delivered projects across AI, automation, backend, and embedded systems. I turn business problems into reliable, scalable systems, working solo from architecture through to deployment.

## CORE SKILLS

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**AI & LLM:** LLM integration (Claude, OpenAI, DeepSeek), AI agents & agentic systems, RAG, generative AI, prompt engineering, NLP, embeddings, vector databases (pgvector, Pinecone), semantic search

**Automation & Browser:** n8n, Make, Zapier, workflow automation, browser automation (Stagehand, Playwright, Browserbase), web scraping (Apify, Firecrawl), data extraction

**Backend & APIs:** Python, FastAPI, Flask, Node.js, TypeScript, REST API design, async programming, microservices

**Voice AI:** Real-time speech-to-text and text-to-speech, conversational voice agents, low-latency audio pipelines

**Data & Databases:** PostgreSQL, pgvector, Supabase, InfluxDB, Firestore, ETL pipelines, time-series data

**Engineering & Hardware:** MATLAB, Simulink, digital signal processing (DSP), system design, RS232 / HDMI-CEC / IP device control, embedded systems

**Tools & DevOps:** Git, GitHub, Linux, Docker, Grafana, Gunicorn, systemd, JSON configuration

## SELECTED PROJECTS

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### AutoListDR — Multi-Portal Real Estate Listing Automation Platform

- End-to-end platform that ingests property media, structures it with AI into typed records, and auto-publishes listings across multiple portals from a single event trigger.
- Built a RAG ingestion pipeline (OCR, vision, transcription), durable orchestration, and browser automation handling multi-stage portal wizards with anti-bot session management.

*Tech: TypeScript, Node.js, n8n, Inngest, OpenAI, PostgreSQL/pgvector, Stagehand, Browserbase*

### BYO Lead Scraper — AI-Powered Lead Generation Pipeline

- Configurable pipeline that scrapes, cleans, enriches, and qualifies leads at scale, processing 30,000+ records.
- Combined structured scraping, open-web crawling, and LLM-based enrichment and scoring with deduplication and idempotent batch processing.

*Tech: n8n, Apify, Firecrawl, DeepSeek, Python*

### AI Content Generation & Evaluation Platform

- Full platform that parses content, generates AI variations across text, voice, and images, and runs blind A/B voting battles ranked on a trust-weighted leaderboard.
- Engineered triple-layer storage, concurrent multi-model generation with retry logic, and a 50,000+ row virtualized data grid.

*Tech: Python, Flask, LLM integration, text-to-speech, image generation, Firestore*

### Real-Time Voice AI Assistant

- Conversational voice assistant that holds natural, low-latency spoken conversations and remembers context.
- Designed a split architecture: a fast real-time path for live replies plus an asynchronous memory path, solving the latency-versus-memory trade-off.

*Tech: n8n, speech-to-text, text-to-speech, real-time LLM, asynchronous memory*

### **Unified TV Control & Monitoring System**

- Single system controlling and monitoring a display fleet across HDMI-CEC, RS232, and IP from one codebase, with scheduled automation and centralized monitoring.
- Implemented an abstract controller over three hardware protocols, a unified time-series schema, and a production daemon with health checks. A hardware-meets-software project.

*Tech: Python, HDMI-CEC, RS232, IP control, InfluxDB, Grafana*

### **Automated Participant Grouping API**

- FastAPI backend that automatically sorts event participants into compatible, age-balanced groups under exclusion constraints, exposed for a no-code frontend.
- Built constraint-based matching, dynamic group sizing, and read-only database integration for zero risk to production data.

*Tech: Python, FastAPI, Supabase, PostgreSQL, FlutterFlow*

## **PROFESSIONAL EXPERIENCE**

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### **Freelance AI & Automation Engineer** — Self-Employed (Upwork)

*2022 – Present | Remote (clients across Europe, US, and globally)*

- Top Rated on Upwork with 100+ completed projects for founders, agencies, and consultants worldwide.
- Deliver complete AI and automation systems solo, from architecture and backend to AI integration and deployment.
- Built voice AI assistants, RAG pipelines, lead-generation systems, browser automation, and multi-tenant integrations (including CRM and voice-AI systems).
- Work directly with non-technical founders, translating business problems into reliable, scalable technical solutions and communicating clearly throughout delivery.

## **EDUCATION**

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### **BSc, Electrical & Communications Engineering**

Institute of Space Technology (IST), Islamabad, Pakistan

- Registered Engineer, Pakistan Engineering Council (PEC): ELECT/104611.
- Focus areas: signal processing, control systems, system design, and applied machine learning.

## **RESEARCH INTERESTS**

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Physics-informed machine learning, graph neural networks for weather prediction, radar and digital signal processing, and metamaterials.

## **LANGUAGES**

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English (professional working proficiency) | Urdu (native)