



Ali Hamza

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ABOUT ME

Software engineer with 4+ years building and leading production web systems, now focused on applied ML systems — model distillation, LLM safety classifiers, and evaluation infrastructure. Six open-source research projects with measured, independently reproducible benchmark results.

WORK EXPERIENCE

🏢 **The Superior Group** – Lahore, Pakistan

Full-Stack Developer / Jr. Lecturer / Team Lead

[01/02/2024 – Current]

Architected and shipped five production platforms now live across the university:

- **Character Mastery** (cm.superior.edu.pk) — Laravel 12 e-learning platform delivering a 16-week auto-scheduled book curriculum across 4 roles and 60+ migrations, with a two-model academic-integrity pipeline: self-hosted DeepSeek-R1 via Ollama for AI-generated-content detection plus an OpenRouter similarity model for cross-submission plagiarism scoring, with configurable thresholds and pairwise flagging.
- **SSA Management System** (ssa.superior.edu.pk) — Django 5/DRF + React 18 platform digitizing the Student Success Advisor program: 16 modules, 6 roles, 386 advisors; queryset-level RBAC, AES-256 encrypted counselling notes, a 25-trigger alert engine, and 6 auto-generated PDF report annexures.
- **Governance Portal** (aimodel.superior.edu.pk) — Node/TypeScript + React 19 system covering the Registrar Office's 8-step statutory meeting lifecycle: 14 KPIs, 8 scheduled jobs, 139 tests; KPI engine verified against the Registrar's own workbook to four decimal places.
- **Soar to Roar** (s2r.superior.edu.pk) — university-wide strategic planning portal on CodeIgniter 4 + MySQL, extending an **87-controller** CRM/PM base with custom modules for strategic drivers, goals, KPI matrices, RASCI assignment, and process/success indicators cascading across faculty, department, and program levels.
- **Complaint Management System** (complaint.superior.edu.pk) — Laravel 11 + MySQL portal with domain-verified public submission, automatic routing across 42 departments, SLA deadline tracking, and role-scoped dashboards for 6 roles.

Led a team of 7 developers with ownership of code review and releases; taught web development and modern frameworks to cohorts of 1500 students and supervise Final Year Projects from requirements through deployment.

🏢 **Cytrom Tech** – Abu Dhabi, United Arab Emirates

Team Lead / Lead Developer

[01/03/2022 – Current]

- Led end-to-end delivery of six client platforms: an ERP system, a travel booking engine with payment integration, a project-management/CRM tool, a Shopify POS deployment, an alumni networking portal, and TravelGood (tours and packages).
- Architected REST API integrations and scalable backends in Laravel, PHP, Vue.js, React.js, Next.js, and MySQL, owning deployment, security hardening, and performance optimization.
- Directed cross-functional teams under Agile delivery; ran code review, mentored junior developers, and served as primary technical contact for client requirements across 16 concurrent projects.

Full-Stack Web Developer

[01/08/2022 – 30/01/2024]

- Delivered five production applications across aerospace (IBN FIRNAS), IT services (BITLOGICX, Oriel Tech), social welfare (Eyes of Hope), and embedded monitoring (Battery Management System), building RESTful APIs and backend services in Laravel, Vue.js, and CodeIgniter.
- Implemented security protocols and ran vulnerability assessments, documenting incidents and mitigation strategies for management review.

RESEARCH & DEVELOPMENT

Prompt-Injection Guardrail — DeBERTa-v3, ONNX, FastAPI

Fine-tuned a 184M encoder on 30.5k examples: **AUROC 0.997 vs 0.972** for Meta's Prompt Guard 2, and **0.867 vs 0.695 recall** at matched false-positive rate. Diagnosed an indirect-injection blind spot (recall 0.55) and closed it to **0.97**; shipped as a pip package and Docker service at ~11 ms batched CPU.

Link: <https://github.com/alihamzazaka/prompt-injection-guardrail>

LLM Drift-Detection Judge — ModernBERT, CUSUM/EWMA, Streamlit

Distilled a frontier groundedness judge to **F1 0.860 at p95 3.71 ms**, wrapped in a shadow-test/canary drift harness. Sequential change-point detection catches a 1σ quality regression in **9.5 samples with 0% miss**, where the standard fixed-threshold rule misses 77–100%.

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Link: <https://github.com/alihamzazaka/llm-drift-detection-judge>

Task-Distilled Small Model — Qwen2.5-0.5B, Unsloth/TRL

Distilled a 14B teacher into a **0.5B** invoice-to-JSON extractor (~28× smaller) at **96.5% of teacher quality**, with a constrained-repair loop giving **100% schema-valid output**. Full closed loop: generation, dedup filtering, leakage-safe splits, SFT, eval gate.

Link: <https://github.com/alihamzazaka/task-distilled-small-model>

Offline-First PWA with CRDT Sync — Yjs, React, Workbox, Playwright

Built provably-convergent offline sync with a PN-counter delta model so concurrent offline edits sum instead of overwriting. Proven by **28/28 Playwright multi-context specs** and a Jepsen-style fuzzer over **1,500 random partition/heal histories**; ships epoch compaction and real Background Sync.

Link: <https://github.com/alihamzazaka/offline-first-pwa-crdt-sync>

Core Web Vitals — Sub-Second Load — Next.js 15, Web Workers, Lighthouse CI

Took a heavy page from **LCP 4.9s → 1.4s** and cut **TBT 50%** at CLS 0.000 via RSC streaming, client islands, and off-main-thread compute. Built a RUM pipeline publishing p75 with **bootstrap 95% confidence intervals**.

Link: <https://github.com/alihamzazaka/core-web-vitals-subsecond-load>

Urdu-English Code-Switched ASR — Whisper, LoRA, jiwer

Fine-tuned Whisper-small on code-switched speech: **WER 54.3% → 35.8%**, **CER 43.3% → 22.5%**. Published a transliteration-aware WER convention, and isolated decoder pathology from real model gain via A/B evaluation.

Link: <https://github.com/alihamzazaka/urdu-english-codeswitch-asr>

EDUCATION AND TRAINING

Masters in Software Engineering

Free University of Bozen-Bolzano [01/07/2026 – Current]

City: Bozen-Bolzano | **Country:** Italy | **Website:** <https://www.unibz.it/> | **Field(s) of study:** Information and Communication Technologies: • Inter-disciplinary programmes and qualifications involving Information and Communication Technologies (ICTs) • Software and applications development and analysis | **Level in EQF:** EQF level 7

Bachelors in Software Engineering

The Superior University [01/10/2019 – 31/08/2023]

City: Lahore | **Country:** Pakistan | **Website:** <https://superior.edu.pk/> | **Field(s) of study:** Information and Communication Technologies: • Software and applications development and analysis • Database and network design and administration • Inter-disciplinary programmes and qualifications involving Information and Communication Technologies (ICTs) | **Level in EQF:** EQF level 6

LANGUAGE SKILLS

Other language(s):

English

LISTENING B2 READING B2 WRITING B2

SPOKEN PRODUCTION B2 SPOKEN INTERACTION B2

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

ML & Applied Research

ONNX Runtime / Hugging Face Transformers / PyTorch / PEFT/LoRA / Unsloth / Knowledge distillation / TRL / Evaluation Harness Design / Whisper fine-tuning / Model Calibration / CUSUM/EWMA change-point detection

Languages

JavaScript / TypeScript / Python (computer programming) / PHP / SQL

Web & Systems

PHP Framework (Codeigniter, Laravel) / Node.js / React.js / Vue.js / Next.js / FastAPI / Controllers Building / CRDTs / REST API Design / NoSQL (IndexedDB, MongoDB, CouchDB) / PostgreSQL

Infrastructure & Tooling

Git/Github, Docker, Gitlab / Version Control (Git) / CUDA / Linux Server, Cpanel / Gradio / Lighthouse CI / Unit Testing (unittest, pytest) / Streamlit / Weights & Biases / Playwright / web programming

ACTIVITIES

LinkedIn

[linkedin.com/in/ali-hamza-8b681a1a0/](https://www.linkedin.com/in/ali-hamza-8b681a1a0/)

Github

github.com/alihamzazaka