

HAMMAD HASSAN

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PROFILE

Undergraduate student (CGPA 4.0) focused on the practical and societal side of AI, where systems break, where they cost more than they admit, and where better judgment can be taught rather than assumed. Currently building HummingBird a real time prompt-compression tool addressing the environmental cost of LLM inference, and running Phase 1 of a cross-dataset EEG seizure-detection study. Founder of Aletheia, a university CS club built around AI literacy and employability.

RESEARCH

Cross-Dataset Domain Adaptation for EEG Seizure Detection

Ongoing Phase 1

CHB-MIT & Siena datasets, SzCORE framework

- Studying generalisation failure in seizure-detection models across hospitals and recording setups, a direct instance of AI reliability breaking down outside its training distribution.
- Applying EEGNet with Euclidean Alignment and CORAL for domain adaptation; Phase 0 (literature grounding with strict primary-source verification) complete, data harmonization underway.
- Built a companion Research Integrity Agent, an automated citation-verification pipeline (68 passing tests, 10 commits), to keep the literature review evidence-grounded rather than LLM-hallucinated.

PLEAD: Predictive LSTM-Enhanced Acoustic Deployment Framework

Manuscript complete, pre-submission

Directed Study research paper, co-authored with Faryaan Khan Boodhoo | Supervised by Prof. Dr. Khalid Hussain

- Proposed an LSTM-based forecasting layer for underwater sensor networks that predicts node battery depletion ahead of time and reroutes around failing nodes before they fail silently, the same class of problem as the EEG work: a system that looks healthy right up until it quietly isn't.
- Conducted a systematic review of 16+ existing IoUT/UWSN routing protocols, establishing that virtually all current approaches make decisions on a node's present state rather than its forecast trajectory.
- Formalised a full theoretical evaluation across five performance dimensions (network lifetime, packet delivery, control overhead, prediction accuracy, energy balance); NS-3 Aqua-Sim NG simulation identified as the next step to validate the model empirically.

PROJECTS

HummingBird - Final Year Project

Proposal submitted; implementation phase

Windows desktop overlay | real-time prompt compression

- Compresses user prompts before they reach an LLM, cutting token usage without materially changing model output quality.
- Frames token efficiency as an environmental problem, not just a cost one, every redundant token is a small, real draw on the water and electricity used to cool and power data centers.
- Positions individual prompting behaviour as a lever ordinary users can pull, rather than treating AI's resource footprint as solely an infrastructure-side problem.

Aletheia - Platform

v1 shipped; actively rebuilding toward v2 + app

Next.js, Supabase, Gemini API

- A full-stack platform helping CS students navigate their field, interactive visual explanations of core CS concepts, an AI-driven skills quiz and career planner, and community-curated learning roadmaps.
- Currently hardening v1 based on a self-initiated technical review (observability, rate limiting, test coverage) before extending it into a mobile app.
- AI career planner: enter a target role and timeline, get a phased plan with skills, certificates, and interview preparation.
- **Live site:** <https://aletheia-ashen.vercel.app/>

Engram

In development

Local-first personal knowledge system

- A privacy-first "second brain" that runs entirely on-device, no cloud sync, no external data exposure, built on the premise that AI-assisted tools shouldn't force a trade-off between usefulness and privacy.
- Early-stage; core motivation is demonstrating that personal AI tooling can be both genuinely useful and structurally private by design, not by policy.

- Engram tracks the active window/application in the background via a 5-second poll, but only *acts* on sustained attention: automatic screen capture fires once per dwell session, after 30+ seconds on the same window, not on every poll.
- **Github Repo:** <https://github.com/imhammad/engram.git>

LEADERSHIP

Aletheia - Founder & Lead Organizer

June 2026 - Present

AIU CS club | mission: Zero Unemployment | Faculty Advisor: Prof. Dr. Zurinahni Zainol

- Founded and lead a student organization teaching practical AI/CS skill and judgment to counter graduate unemployment, with a core team spanning instruction, media, and logistics.
- Designed and ran PROMPTED, a prompt-engineering workshop, with full supporting materials (facilitator scripts, university proposal, workshop report, promotional content).
- Currently hosting a 5 session's hardware bootcamp: (Getting to Know Arduino), specifically organized for girls to get hands on practice on hardware and build projects to showcase their skills, aiming at SDG5 gender equality.
- Launching LENS, a 10-session Computer Vision bootcamp (from 31 Aug 2026), including 8 hands-on-practice projects, and final individual projects that the students have to present to the faculty.

EDUCATION

Bachelor of Computer Science (Honours)

2024 - Present

Albukhary International University, Alor Setar, Malaysia (Full Scholarship). CGPA 4.0

Current State: Second Year Third Semester.

High School Intermediate of Computer Science (ICS)

2021 - 2023

Government Postgraduate Science College, Quetta, Pakistan. Graduated with straight A grades.

SKILLS

Python | JavaScript/TypeScript | React/Next.js | Web Development | Machine Learning | Model Fine-tuning | Computer Vision
EEGNet & Domain Adaptation Methods | Supabase | Technical Writing | Research Literature Review | MySQL Database |
Workshop Design & Facilitation