

# Ahmad Kassem

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## Education

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**Lebanese University, Faculty of Science Branch 3** – BS in Computer Science

**Expected July 2026**

**Relevant Coursework:** Data Structures & Algorithms, Operating Systems, Software Engineering, Database Architecture, Computer Networking, Cybersecurity, Artificial Intelligence.

## Skills

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**Languages:** Python, Java, C/C++, C#, JavaScript, PHP, SQL, HTML/CSS.

**Frameworks & Libraries:** React, Node.js, Express.js, .NET, Android SDK, MPI, OpenMP.

**Databases:** Oracle 12c, SQLite, SQL Server, MySQL, MongoDB.

**Cloud & DevOps:** AWS, Docker, Git/GitHub, Virtualization, GitHub Actions.

**Applied AI & LLMs:** Agentic Systems (ReAct, Multi-Agent Orchestration, Function Calling), RAG Pipelines (Pinecone, FAISS, pgvector), Large Language Models (Transformers), Fine-Tuning & Alignment (LoRA, RLHF, DPO), Deep Learning.

**Architecture & Security:** RBAC, RESTful APIs, MVC & MVVM Patterns, Repository Pattern, System Design, OWASP Standards, Secure Auth, POSIX API, TCP/IP, IPC, Embedded Systems.

**IT & Systems Administration:** Windows and Linux Administration, Hardware and Software Diagnostics, Advanced Troubleshooting.

## Experience

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**LebNet Tech Fellow | LebNet (U.S. & Canada) | Lebanon | Jun 2026 – Present**

- Selected for a highly competitive AI engineering fellowship, mentored by researchers from Stanford, MIT, and Microsoft, to develop an applied AI solution addressing local challenges in Lebanon.
- Building end-to-end machine learning pipelines by implementing classical predictive ensembles (XGBoost) and deep neural networks (CNNs, ResNets) while managing data strategy and bias-variance tradeoffs.
- Architecting Generative AI applications utilizing Transformer models, advanced prompting (Chain-of-Thought), and parameter-efficient fine-tuning (PEFT) techniques including LoRA and QLoRA.
- Engineering autonomous AI systems by integrating Retrieval-Augmented Generation (RAG) with vector databases (Pinecone, FAISS) and deploying ReAct multi-agent workflows.
- Evaluating Large Language Models against standard benchmarks (MMLU, HumanEval) and applying alignment methodologies (RLHF, DPO) to ensure safe, ethical, and robust deployment.

## Projects

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### Distributed AI Network IDS | C, MPI, OpenMP, Machine Learning

- Engineered a distributed intrusion detection system in C utilizing MPI and OpenMP, analyzing 500,000+ network packets in under 0.03 seconds and achieving a 3.0x parallel processing speedup.
- Implemented an unsupervised K-Means++ clustering algorithm within a 4-phase distributed pipeline, utilizing custom MPI datatypes to automatically classify threat patterns with zero data loss.

### SysGuard — Linux Process Watchdog | C, POSIX API, Linux

- Built a system process supervisor in C using the POSIX API, achieving a 95% automated recovery rate for crashed background services within 3 seconds of failure detection.
- Implemented non-blocking IPC via Named Pipes, enabling the live administration module to handle up to 50 concurrent commands without thread starvation.

### Bella Vista — Restaurant Management System | Node.js, Oracle 12c, JavaScript

- Engineered a full-stack web platform driven by a Node.js/Express.js REST API to streamline core business operations, reducing simulated order processing latency by 40%.
- Architected a 3NF-normalized Oracle 12c database with custom RBAC, ensuring strict data segregation across 3 distinct user tiers (Admin, Staff, Customer).

### RestoApp Management System | C#, ASP.NET, SQL Server, Bootstrap

- Developed a full-stack enterprise web application utilizing C#, ASP.NET, and a scalable Repository Pattern architecture to manage end-to-end restaurant operations.
- Architected a secure SQL Server database and authentication flow, implementing BCrypt hashing, HMAC-SHA256 tokens, and parameterized queries to prevent SQL injection vulnerabilities.

### Restaurant Android Application | Java, Android SDK, SQLite

- Developed a native Android application utilizing MVVM architecture, ensuring a responsive user interface that maintained a smooth 60 FPS rendering performance during heavy list scrolling.
- Engineered a modular, swappable data layer with SQLite and in-memory caching, decreasing average data retrieval times by 60% for frequently accessed restaurant profiles.

### Students Management Portal | PHP, MySQL, MVC Architecture

- Built an MVC-compliant dynamic web application utilizing PHP and MySQL, digitizing records for over 500 simulated student profiles and reducing manual workflow steps by 50%.
- Hardened backend database interactions against SQL injection vulnerabilities by universally implementing secure PDO prepared statements, achieving 100% compliance with OWASP database security standards.

## Leadership & Volunteer Experience

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### Computer Science Student Delegate | Lebanese University, Faculty of Science Branch 3 | Lebanon | 2024 – 2026

- Represented a cohort of 300+ Computer Science students, acting as the primary faculty liaison to successfully advocate for student needs and resolve over 30 academic or scheduling conflicts per semester.
- Spearheaded the planning and execution of 5+ university technical workshops and academic initiatives.