

Education

LEBANESE AMERICAN UNIVERSITY

B.S. Computer Science 3.69

Distinction and Honors.

Relevant Coursework: Data Structures and Algorithms, Operating Systems, Database Management Systems, Machine Learning, and Software Engineering

Beirut, LB

May 2027

Projects

Reputation & Utility-Aware Client Selection for Multi-Modal Federated Learning

January 2026 – May 2026

Sole author

- Designed a novel client selection algorithm that combines battery/compute capability, seismic data utility, reputation scoring, and an Upper Confidence Bound (UCB) exploration term – specifically for post-earthquake building damage assessment.
- Built a geo-located multi-modal dataset of 128,843 buildings by fusing ground motion parameters, high-resolution aerial imagery, and 2024 Noto Peninsula earthquake damage labels.
- Implemented a hierarchical federated learning system in PyTorch using EfficientNet-B0 + structured feature fusion, achieving 0.12 higher macro F1, a 4× reduction in communication cost, and 2–5× faster convergence over FedCS and other baselines.

Civil Defense Emergency Management System

January 2026 – May 2026

Team Lead (5 members) – Course project for CSC490 Software Engineering

- Led the end-to-end design of a real-time, cross-platform emergency response platform for civil defense operations, coordinating dispatchers, field teams, and citizens.
- Designed a three-tier system (web dashboard, mobile app, backend) using **React**, **Android Studio**, **Django**, and **PostgreSQL**.
- Defined the full 270-page Software Requirements Specification (SRS), including functional/non-functional requirements, system architecture, UML models, and a comprehensive test suite with 80+ test cases.

Fitness Club DBMS

September 2025 – November 2025

Database design and implementation (lead a 5-member team)

- Led the team through a full relational database lifecycle: requirements analysis, ER modeling (12+ entities, 15+ relationships), normalization to BCNF, and SQL DDL/DML implementation.
- Developed complex queries, triggers, and transaction logic; produced a 150+ page documented report that served as the team's quality standard.

Chemistry Tool Suite

October 2024 – November 2024

Python-based desktop application (3-member team)

- Architected a modular OOP framework offering seven computational chemistry tools.
- Developed a custom **O(log n)** chemical-balancing algorithm (improving on typical **O(n²)** Gaussian elimination) and an **O(n)** parser; validated accuracy across 50+ test cases.

Leadership and Activities

LEBANESE RED CROSS

Beirut, LB

Emergency Medical Responder

March 2025 – August 2025

- Responded to emergency calls and provided immediate medical support across diverse field conditions.
- Collaborated with multidisciplinary teams to stabilize patients and ensure rapid, coordinated care.
- Completed rigorous training in crisis response, safety protocols, and high-pressure decision-making.

Programming Languages: Java, C, C++, Python, SQL, JavaScript, C#, Go, Bash.

Tools & Frameworks: Git, GitHub, AWS, Firebase, Unity, WSL2, Tkinter, MySQL, SQLite.

Core Competencies: Object-Oriented Programming, Data Structures & Algorithms, Operating Systems, Database Design, API Design, Software Architecture, Version Control.

Additional: Agile Methodology, Debugging, Code Review, UI/UX Design Principles.