

# Hamza Atout

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## EDUCATION

### American University of Beirut

*Bachelor of Engineering in Computer Science & Engineering (GPA: 3.83/4.00)*

- Concentration Area: Data Science & AI
- Bridge Full Scholar

Beirut, Lebanon

Sep 2022 – May 2026

## EXPERIENCE

### Undergraduate Research Assistant – ML for Healthcare

Aug 2025 – Dec 2025

*American University of Beirut*

Beirut, Lebanon

- Developed, under supervision of Dr. Ayman Kayssi, a longitudinal MS lesion segmentation pipeline using **PyTorch** and **Difference Weighting Blocks (DWB)** to model temporal disease progression.
- Achieved **114.2% generalization improvement** (Dice 0.475) across 7 datasets by implementing **Focal-Tversky loss** and histogram matching to handle domain shifts.

### Software Engineering Intern

May 2025 – Aug 2025

*Tecfrac SAL*

Beirut, Lebanon

- Architected **Whish-Guard**, a real-time fraud detection platform using **FastAPI**, **Spring Boot**, and **MySQL** for scoring and persistence.
- Engineered clustering algorithms, model lifecycle management, and automated **pytest** suites to ensure reliability of feature extraction and inference.

### Teaching Assistant & Organizer

Sep 2023 – Jan 2025

*American University of Beirut*

Beirut, Lebanon

- Instructed **Introduction to Programming & Computing** (Python) labs and organized **EECE 230X** (600+ participants), managing logistics and conducting technical interviews.

## TECHNICAL SKILLS

**Languages:** Python, C++, SQL, Java, Kotlin, JavaScript, HTML/CSS

**Frameworks & Tools:** FastAPI, Flask, Spring Boot, React.js, Docker, Azure, Git, MySQL, PostgreSQL

**Machine Learning:** Tensorflow, PyTorch, Pandas, NumPy, Scikit-learn, RAG, LLMs, Computer Vision (CNN/RNN)

## PROJECTS

### Ehjezle (Smart Booking System) | *Flask, Docker, SQLite, Microservices*

- Architected a secure Microservices backend for facility management, deploying four isolated services (User, Booking, Room, Review) using Docker containers.
- Implemented Role-Based Access Control (RBAC) and request profiling, ensuring scalable security and optimized performance for concurrent users.

### AI-Powered Nutrition Platform | *FastAPI, React.js, PostgreSQL, ML*

- Developed a full-stack health platform orchestrating four ML models via REST APIs to predict gut health metrics from food imagery and glucose data.
- Integrated a PostgreSQL database with a FastAPI backend to handle real-time inference requests and macronutrient analysis.

### Azure RAG Chatbot | *Azure Cloud, LLMs, Vector Search*

- Deployed a Retrieval-Augmented Generation (RAG) system on Azure, enabling a chatbot to ingest uploaded documents and provide context-aware answers using vector retrieval.

### EchoBridge (Accessibility Tool) | *Python, TensorFlow, CNNs, RNNs*

- Engineered a sign language recognition model utilizing 3D CNNs and 2D CNNs + RNNs to translate gestures into text, facilitating real-time communication for the hearing impaired.

## EXTRACURRICULARS

### Insight Club AUB | *President*

May 2025 – Present

### Google Developer Groups (GDG) | *Technical Officer*

Mar 2025 – Sep 2025

### IEEE AUB Student Branch | *Member at Large*

Oct 2023 – Sep 2024