HASAN AJJAN

4th Year Computer & Communication Engineering Student – Telecommunications
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PROFESSIONAL SUMMARY

Dedicated and analytically driven **Computer and Communication Engineering student (Telecommunication option)** at USJ–ESIB with strong foundations in **telecommunications, network engineering, embedded systems, and AI-driven algorithm design**. Experienced with microcontrollers (PIC, Arduino), low-level programming (Assembly), and digital/analog communication principles.
Proficient in **Python, C++, SQL, and PIC ASM**, with hands-on experience designing **search algorithms, signal-processing systems, and embedded control architectures**.
Seeking a **summer internship** in **telecommunications, networking, embedded systems, or cybersecurity**, where technical rigor and system-level problem-solving are valued.

EDUCATION

Saint Joseph University of Beirut (USJ – ESIB)

Bachelors in computer and communication engineering – Telecommunication Option
Expected Graduation: **October 2027**
Mean: **16 / 20**

Relevant Coursework:

- Networks, Routing & Switching
- Analog & Digital Communication, Wireless Communication, Digital Signal Processing (DSP)
- Operating Systems, Unix System Administration
- Natural Language Processing, Introduction to AI, Graph Theory & Operational Research
- SQL, Relational Databases
- Programming (C++, Python, PIC Assembly), Data Structures & Algorithms
- Digital & Analog Electronics

École Française Internationale de Djeddah

French Baccalaureate — **Mention Bien**

TECHNICAL SKILLS

Programming & Software

Python • C++ • SQL • PIC Assembly
MATLAB • Git • Linux (User & basic admin)
MPLAB X IDE • Arduino IDE

Networking & Telecommunications

TCP/IP • UDP • VLANs • Routing (static & dynamic)
Network Security • Packet Switching
Cisco CCNA-1 & CCNA-2 knowledge
Wireshark • Packet Tracer • GNS3

Systems & Hardware

PIC18FXX2 / PIC18FXX20 microcontrollers
Arduino-based systems
Digital Logic Circuits • Sensor Interfacing
Real-time control algorithms

Other Skills

Problem-solving • System design • Algorithmic thinking
Teamwork • Communication • Time Management
Innovation • Technical documentation

Languages

Arabic (Native) • French (Native) • English (Professional) • Spanish (Elementary)

CERTIFICATIONS

- **CCNA: Introduction to Networks (Cisco)**
- **Semicolon Cybersecurity CTF Program (2025)**

PROJECTS

Autonomous Environmental Regulation System (Arduino Systems Project)

Designed and implemented a microcontroller-based system capable of regulating environmental conditions such as **solar exposure, humidity, and irrigation**.
Technical Contributions:

- Developed **real-time control logic** for actuator and sensor management
- Implemented **sensor calibration**, analog signal reading, and digital filtering

- Designed the **system integration architecture**, combining hardware and firmware/ Applied Arduino programming and embedded communication protocols
  Outcome:
  Achieved stable environmental control cycles with reliable sensor-actuator feedback loops.

4×4 Minimax-Based Tic-Tac-Toe AI Engine

Developed an AI agent using a **minimax search tree with variable depth** to support multiple difficulty levels.
Key Achievements:

- Implemented minimax with **depth-based pruning strategies**
- Reduced computation time significantly using **alpha-beta pruning**
  Outcome:
  At maximum depth, the AI is effectively unbeatable, demonstrating correct evaluation and pruning efficiency.

Virtual Robot Navigation Using Search Algorithms

Implemented and evaluated navigation algorithms for a robot in a 2D grid using **UCS and A*** with **Manhattan, Euclidean, and Chebyshev heuristics**.
Technical Work:

- Implemented search trees and heuristic functions
- Compared algorithmic performance in terms of **time, accuracy, and path optimality/** Analyzed tradeoffs between admissible and non-admissible heuristics
  Outcome:
  Identified the heuristic producing optimal computation time while maintaining near-realistic path planning.

PROJECTS IN PROGRESS

NLP System — Narrative Topic & Emotion Extraction Assistant

Developing an NLP-based assistant capable of extracting **semantic themes and emotional tone** from textual narratives to support **music composition and creative workflows**.

Microcontroller System — Prepaid Energy Counter

Implementing a PIC-based prepaid energy measurement system using **ADC sampling, current sensing (ACS712), real-time energy calculation**, and EEPROM-based credit storage.