

MOHAMAD ALAYLI

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<https://github.com/MohamadA12-programmer>

Computer Science Student

SUMMARY

Computer Science student with strong proficiency in Java, Python, C, and SQL. Experienced in designing and implementing data structures, algorithms, and system architectures. Developed web applications and database-driven systems, applying analytical problem-solving to optimize performance. Successfully completed projects in AI, Database Management Systems, Web-development, Microservices, demonstrating the ability to deliver efficient solutions in both individual and team settings.

PROJECTS:

AutoSentinel project

- Developed an autonomous AI cybersecurity system integrating Vision Transformers (ViT) and Multi-Agent Reinforcement Learning (MARL) for real-time threat detection and response. Achieved 330% accuracy improvement (11.7% to 50.9%) through custom ViT architecture featuring multi-head attention, residual connections, momentum optimization, and learning rate scheduling. Designed coordinated MARL system with 3 Q-learning agents achieving 93.7% security score across 6 automated response actions (Monitor, Block, Isolate, Alert, Patch, Backup). Built end-to-end data pipeline processing 10,000 CICIDS2017 network traffic samples with balanced augmentation and integrated ViT-MARL-LLM orchestration achieving <1ms response time with 95%+ effectiveness across 8 attack types including DDoS, SQL Injection, XSS, Brute Force, and Infiltration attacks.

Dealership BackEnd (Internship Project)

- Developed a distributed microservices dealership system using Spring Boot 3.5, Java 17+, and PostgreSQL with JWT authentication. Architected event-driven communication using RabbitMQ to publish domain events from the main API to a listener microservice for asynchronous processing. Built RESTful APIs with JPA/Hibernate across five entities, configured RabbitMQ consumers with JSON serialization, and implemented Caffeine/Redis caching. Deployed monitoring infrastructure with Docker Compose, Prometheus, and Grafana. Structured both microservices following MVC architecture with comprehensive exception handling.

AI-Driven Drone Fleet Management System(Capstone Project)

<https://youtu.be/ysxJycV6BDs?si=Kv-6zNrWU0BI4Boq>

- **System Architecture:** Developed a full-stack "Drone Command Center" (DCC) utilizing a Java Spring Boot backend and a cross-platform Flutter mobile frontend to orchestrate autonomous missions and monitor real-time telemetry.
- **AI & Navigation:** Integrated a Deep Reinforcement Learning (DRL) navigation layer based on the NavRL framework, utilizing Proximal Policy Optimization (PPO) and a LiDAR-based safety shield for reactive obstacle avoidance in unmapped urban environments.
- **Hybrid Path Planning:** Engineered a hybrid planning system that bridges high-level global city-routing with local, reinforcement-learning-driven reactive behaviors to ensure safe navigation through complex structures.
- **Data Orchestration:** Implemented a robust data layer using PostgreSQL for persistent storage and RabbitMQ for asynchronous messaging between the command center and the flight simulation environment.
- **High-Fidelity Simulation:** Validated system performance within Microsoft AirSim and Unreal Engine 4, performing rigorous testing on collision rates, success metrics, and sensor fusion accuracy.
- **Mechanical Design:** Designed and optimized custom 3D hardware mounts and chassis components using Fusion 360 and SolidWorks to support the integration of Jetson Orin NX and Livox LiDAR sensors.

Escape Room web project

- Developed a full-stack Escape Room game using PHP, MySQL, HTML5, CSS3, JavaScript, and jQuery. Implemented session-based user authentication, RESTful API endpoints for data management, and AJAX-powered real-time leaderboard functionality. Designed interactive puzzle mechanics with inventory systems, audio integration, and timer-based scoring. Built a secure backend with MySQL database architecture featuring user credential management and optimized score tracking that updates only when players achieve better completion times.

EXPERIENCE

Software Developer at Monty Mobile

July 2025 - August 2025

- Gained hands-on experience in backend development using Spring Boot, focusing on API design, security, and system optimization.
- Enhanced teamwork, problem-solving, and professional communication skills through collaboration with experienced developers.

EDUCATION

Bachelor of Science in Computer Science

Dec 2023 - May 2026

Lebanese American University

- Focused on Autonomous Systems, Cybersecurity, Networking, System Security and Software development.

ADDITIONAL INFORMATION

- **Technical Skills:**
- **Languages:** Java, Python, C, SQL, JavaScript
- **Backend:** Spring Boot, REST APIs, JWT, Hibernate
- **Databases:** PostgreSQL, MySQL, Redis
- **Messaging:** RabbitMQ
- **AI/ML:** PPO, Reinforcement Learning, Vision Transformers
- **Tools:** Docker, Git, Grafana, Prometheus
- **Simulation:** AirSim, Unreal Engine
- **CAD:** Fusion 360, SolidWorks

- **Soft Skills:** Problem Solving, Good communication skills, Strong logical thinking with analytical reasoning, Creative Thinking, Conflict management, Team Collaborator
- **Languages:** Arabic, French, English
- **Certifications:** - Introduction to Cybersecurity (Cisco)
- Networking Basics (Cisco)