ALEXANDER EL GHAOUI

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EDUCATION

BACHELOR OF ENGINEERING, SOFTWARE ENGINEERING| WINTER 2022 – EXPECTED WINTER 2026

Concordia University, Montreal, QC, Canada

TECHNICAL SKILLS & LANGUAGES

- **Programming Languages:** Java, Python, C++, C, JavaScript, HTML, CSS, SQL, PostgreSQL, R, Clojure, Figma, GitHub.
- **Software's and Frameworks:** Django, React, NumPy, Matplotlib, OpenCV, PyTorch
- Fluent in English, French, Arabic.

EXPERIENCE

Concordia UAV club – Software team member | January 2024 – March 2024

- Built an **image recognition** module using **PyTorch and a lightweight CNN** to support autonomous drone-based identity confirmation for payload handling scenarios.
- Implemented **contrastive loss training** achieving over **80% precision**, optimizing pairwise distance thresholds to improve verification accuracy.
- Applied **NumPy** for efficient **data handling** and **Matplotlib** for model performance visualization - conducted thorough testing to ensure robustness in flight conditions.

RAMS – Software engineering intern | June 2023 – August 2023

- Developed proficiency in **Clojure** and **Clojure Script**, applying these languages in the **full-stack** development process, contributing effectively to both front-end and back-end development tasks.
- Involved in **ERP software methodology** implementation, enhancing business process optimization and project management efficiency.
- Managed database operations, including migrations and data integrity, contributing to the robust backend support of client projects.
- Collaborated closely with a team of developers to create and deliver custom software solutions/services for clients in the Middle East, ensuring client specifications and quality standards were met.

MTA – IT technician intern| July-August 2022

- Assisted in maintaining **30+** data server centers for **IPTV and internet distribution**, ensuring optimal performance and reliability for more than **30 thousand** customers.
- Utilized **CryptoGuard** encryption technologies to secure IPTV content delivery, protecting customer data and preventing unauthorized access to streaming services.
- Gained in-depth knowledge about data transmission, frequency management in telecom, and identified various traffic/signal disruptors affecting connectivity.

PROJECTS & CERTIFICATIONS

John Hopkins University | ***Data Science: Foundation using R - Specialization*** | **April 2023**

- Developed and executed data collection scripts in **R**, focusing on data collection and cleansing techniques in projects that involved aggregating and processing datasets from different websites and file types, showcasing versatility in data manipulation.

Condo Rental and Management Website (Mini Capstone) | Winter 2024

- Designed and developed a dynamic dashboard layout in **React**, implementing user-friendly interfaces for property management and streamlined condo fee calculations.
- Built a **Django-based backend system**, including a **RESTful API** and a robust calculation engine to compute condo fees dynamically, ensuring scalability and accurate data management.
- Implemented key features such as property listings, broker profiles, and client-broker communication channels, enhancing the realism and utility of the simulation.

Financial Data Management System | **Database Project | Fall 2024**

- Led the **migration** of financial data from a **PostgreSQL** relational database to **MongoDB**, restructuring datasets for efficient document-based storage and scalability.
- Mitigated data quality challenges by developing robust validation and transformation scripts, ensuring consistency across datasets from multiple APIs.

Advanced Program Design with C++ | Risk Game Implementation| Fall 2024

- Engineered a **fully object-oriented** design for a command-line-based "Risk" game, implementing modular classes to handle game phases, player actions, and map management using **C++.**
- Designed a modular system to simulate a **connected graph map** with territories and continents, enabling real-time updates during gameplay.
- Developed and tested a dynamic round-robin game loop with features like random card draws, player elimination, and victory conditions, ensuring smooth game progression.

Mini Chess AI Implementation | Winter 2025

- Developed a **Python-based** Mini Chess engine with **minimax** search and **alpha–beta pruning**, using iterative deepening to guarantee move delivery under strict time constraints
- Engineered and benchmarked two evaluation heuristics—material-based (e0) and positional (e1)—achieving a ~60% win rate for the refined heuristic in AI-vs-AI tournaments
- Integrated detailed game tracing (move logs, search statistics, branching factors) to drive performance analysis and iterative improvements