Zein SAKKOUR

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Quantitative Finance enthusiast with a Double Bachelor's Degree in Mathematics and Computer Science. Currently, pursuing a dual program of Bachelor's and Master's in Engineering at CentraleSupélec (Diplôme d'Ingénieur Grande École), where I will be majoring in Mathematical Finance. I am also completing a Micromaster's in Finance from MIT Sloan School of Management.
I am actively seeking an off-cycle internship between June 2024 & September 2025

EDUCATION

CentraleSupélec *(Diplôme d'Ingénieur Grande École)* **Paris, France**
Master's in General Engineering *Ongoing – 2023 –2025*
- **Relevant Coursework:** Advanced Probability, Partial Differential Equations, Strategic Interactions in Game Theory.

Bachelor's in Engineering *Ongoing – 2023 –2024*
- **Relevant Coursework:** Modeling Representations and Analysis, Quantum Physics, Industrial Engineering, Electronic Systems.

MIT Sloan School of Management **Massachusetts, USA**
MicroMaster's in Finance (Online) *Ongoing – 2023 –2024*
- **Awards & Honors:** Scholarship 90%.
- **Relevant Coursework:** Mathematical Methods in Quantitative Finance, Derivatives Markets: Advanced Modeling & Strategies.

Sorbonne University **Paris, France**
Bachelor of Computer Science **3.9/4.0 GPA** *2020 –2023*
Relevant Coursework & Ranking:
Computability & decidability (5th/88), Advanced algorithms (17th/116), AI & Operational Research (8th/129).

Bachelor of Mathematics **3.9/4.0 GPA** *2020 –2023*
Relevant Coursework & Ranking:
Advanced Measure and Probability Theory(7th/174), Numerical & Functional Analysis, Multilinear Algebra.

WORK EXPERIENCE

Software Engineer Intern (Python), SYSTEMIS **Paris, France**
IT & Cybersecurity Company *July 1rst 2023 – September 25th, 2023*
- Developed and maintained cybersecurity software solutions to protect against threats using **Python**.
- Implement advanced threat detection algorithms, improving incident response time by 5%.
- Participated in penetration testing and conducted vulnerability assessments (Nmap, OpenVAS, Metasploit, and more).
- Researched the influence of Artificial Intelligence on cybersecurity.

Research & Development Intern (Python and C++.), LIP6-Lab of Sorbonne University **Paris, France**
Institution of Higher Education's Research Lab *March 1rst 2022 – July 15th, 2022*
- Implemented cryptanalysis algorithms, including hill-climbing, ICM, BSGS, and genetic algorithms using **Python and C++**.
- Studied the effectiveness of these algorithms on a range of cryptosystems, such as substitution cipher, DSE cipher, Vigenere, El-Gamal, and RSA, utilizing advanced arithmetic techniques like discrete logarithm.

Competitive Programming Training (Python and C++.), LIP6-Lab of Sorbonne University **Paris, France**
Institution of Higher Education *September 1rst 2021 – February 15th, 2023*
- Developed strong programming and problem-solving skills, with focus on **Python and C++** during intensive training.
- Developed deep knowledge of advanced algorithms and data structures applying them to programming challenges.
- Actively engaged in weekly competitive programming training sessions, including internal contests with graduate students.

ACCOMPLISHMENTS

Southwestern Europe Contest SWERC Programming Contest **Milano, Italie**
ICPC International Collegiate Programming Contest *February 17th, 2023*
- Ranked 36th out of 120 teams, 7th among the French teams, achieved the best historical ranking of Sorbonne University.

International Olympiad in Informatics IOI Certificate of Appreciation Syrian IOI Qualifications. 2017, **Syria**
- Ranked 2nd at the IOI Qualifications (Syria-Belarus-Russia). *2018* **Minsk, Belarus**

International Mathematical Olympiad IMO Certificate of Appreciation Syrian IMO Qualifications.

World Robot Olympiad *WRO Association*
- Ranked 1st in the regional phase, qualification for the world championship. *2015*, **Syria**
- Ranked 2nd in the regional phase, qualification for the world championship. *2016 & 2017*, **Syria**

PROFESSIONAL SKILLS

- **Languages: French** Fluent, **English** Fluent, **Russian** Notions, **Arabic** Native.
- **Proficient:** C/C++ (STL, Eigen), Python (Numpy, Gurobi, Pandas, Scikit-learn, TensorFlow).
- **Experienced:** Ocaml, SQL, Java, JavaScript, R, Microsoft Office, Bloomberg, Machine Learning (Scikit-learn, TensorFlow).

PROJECTS

Stock Trading Bot Project: Mathematical Market Analysis (Python) *Ongoing Independent project 2023*

- *Algorithmic Strategy Development:*
  Implemented trading strategies using mathematical models while analyzing historical stock data for data-driven decisions.
- *Statistical Arbitrage:* Applied cointegration and correlation analysis for identifying profitable stock pairs.
- Used mathematical optimization (e.g., Markowitz model) for building diversified portfolios.
- *Time Series Forecasting:* Employed ARIMA and GARCH models for predicting stock price movements.
- *Monte Carlo Simulations for Risk Assessment:* Conducted simulations to assess and optimize trading position risk.

Project X AE A-12: Fake News Detector using Machine Learning (Python) *Coursework 2022*

- *Machine Learning (***scikit-learn***):* TfidfVectorizer and PassiveAggressiveClassifier, for robust fake news classification.
- Developed a scraping bot to bypass Twitter/X API.

Blockchain (C/C++) *Coursework 2022*

- Created a blockchain from scratch using C implementing a proof-of-work consensus algorithm.
- Integrated RSA cryptographic functions for enhanced security.
- Developed an algorithm that relies on the longest chain for trustworthiness.
- Crafted a customized minimalist unit test framework to ensure robustness.

Automate (Python) *Coursework 2022 - 2023*

- Created and implemented automata using Python.
- *Developed various automaton functions including* Determination, Concatenation, Multiplication, Union, Language recognition, Regular expression conversion, Transition diagrams, State transition simulations.
- Designed and implemented a comprehensive testing environment.
- Applied the Automate project to solve mathematical problems, such as simplifying algebraic expressions using regular expressions and automaton-based transformations.

AI Chess-BOT (C++) *Independent project 2022*

- Developed a C++ chess-playing program with AI capabilities.
- Implemented a customizable depth decision tree for AI decision-making.
- Utilized an alpha-beta pruning algorithm for predicting optimal chess moves.
- Included support for advanced chess rules such as castling, the fifty-move rule, triple repetition, and pawn promotion.

DNA Sequence alignment (C/C++) *Coursework 2023*

- Focused on solving a genomics problem: sequence alignment, employing dynamic programming algorithms to measure genetic similarities and differences between two DNA sequences represented as sequences of nucleotides.
- Implemented algorithms for sequence alignment, including Needleman-Wunsch and Smith-Waterman, to find optimal alignments.

Optimization Problem (Python) *Coursework 2023*

Designated as the best project in AI, Optimization & Operations Research Cours at Sorbonne University.

- Successfully tackled optimization challenges using linear programming techniques, leveraging the Gurobi library.
- Implemented flow algorithms, including max Flow/min cut, such as the Ford-Fulkerson algorithm and many optimization algorithms, including Dijkstra's algorithm, the simplex method, and the branch and bound algorithm, to apply in decision-making for achieving optimal solutions.

Personal Portfolio Website (HTML, CSS, JavaScript) *Independent project 2023*

- *Interactive Web Design:*
  Crafted an interactive personal portfolio website using HTML, CSS, and JavaScript for a dynamic user experience.
- *User-Centered Navigation:*
  Prioritized user-friendliness with smooth animations and intuitive navigation, ensuring a seamless browsing experience.