

# 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)

Master's in General Engineering

Paris, France

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

MicroMaster's in Finance (Online)

Massachusetts, USA

Ongoing – 2023 – 2024

▪ **Awards & Honors:** Scholarship 90%.

▪ **Relevant Coursework:** Mathematical Methods in Quantitative Finance, Derivatives Markets: Advanced Modeling & Strategies.

### Sorbonne University

Bachelor of Computer Science 3.9/4.0 GPA

Paris, France

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

IT & Cybersecurity Company

Paris, France

July 1<sup>st</sup> 2023 – September 25<sup>th</sup>, 2023

- Developed and maintained cybersecurity software solutions to protect against threats using **Python**.
- Implemented 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

Institution of Higher Education's Research Lab

Paris, France

March 1<sup>st</sup> 2022 – July 15<sup>th</sup>, 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

Institution of Higher Education

Paris, France

September 1<sup>st</sup> 2021 – February 15<sup>th</sup>, 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

ICPC International Collegiate Programming Contest

Milano, Italie

February 17<sup>th</sup>, 2023

- Ranked 36<sup>th</sup> 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 2<sup>nd</sup> 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 1<sup>st</sup> in the regional phase, qualification for the world championship.
- Ranked 2<sup>nd</sup> in the regional phase, qualification for the world championship.

2015, Syria

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

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### 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.