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Soufiane FAFE

Education

2018 - Present **Ecole Polytechnique**, *Palaiseau*, France.
Degrees awarded: Bachelor of Science (2020) and Master of Science (2021).
Coursework includes: *Operations Research, Statistics, Monte-Carlo Methods and Stochastic Processes, Stochastic Calculus in Finance, Automatic Control, Managing uncertainties and risk analysis.*

2017 - 2018 **Ecole Centrale Paris**, *Gif-sur-Yvette*, France.
Degrees awarded: Bachelor's Degree in engineering.
Coursework includes: *Analysis, Probability, Statistics, Partial differential equations, Algorithmic and programming, Software engineering, Quantum and statistical mechanics.*

2014 - 2017 **Preparatory program**, *Lycée Moulay Idriss*, Fez, Morocco.
MPSI/MP*, Mathematics and physics, A^+
Preparation study for highly selective entrance exams to French Grandes Ecoles
Honors: Summa Cum Laude • France's Major-Excellence Scholarship.

2014 **Baccalaureate in mathematics**, *Lycée Moulay Slimane*, Fez, Morocco.
Awarded with highest honors.

Research experience

Sep 2020 – **Sizing of a technician intervention center on an electrical distribution network**, *Department of Applied Mathematics*, Ecole Polytechnique - EDF.
Advisors: Stéphane Gaubert & Xavier Allamigeon

- Developed a timed Petri network model to size the call center.
- Simulated the performance indicators of the model using tropical geometry.

Nov 2019 - Feb 2020 **Modelling of crowd movements**, *Department of Applied Mathematics*, Ecole Polytechnique.
Advisors: Alexandre Ern & Samuel Amstutz & Aline Lefebvre-Lepot

- Modeled crowd movement using the social forces model and the granular model.
- Simulated the behavior of pedestrians with and without obstacles for both models.
- Estimated the pedestrian's desired speed using Uzawa's algorithm.

Sep 2019 – May 2020 **Spectral optimization on quantum graphs**, *Ecole Polytechnique.*
Advisor: Guillaume Levy

- Implemented a simulation-based optimization algorithm that maximizes the minimum of the first eigenvalue of the positive Laplacian for some graphs.
- Combined approaches based on simulated annealing, variational method and Metropolis-Hastings rule.

Sep 2017 – May 2018 **Statistical analysis of the performance of a helicopter combustion chamber**, *Ecole Centrale Paris - Safran.*
Advisors: Aymeric Vie & Guillaume Vignat

- Provided a tool for calculating tolerance intervals relevant to the manufacture of a combustion chamber.

Working and teaching experience

June 2020 - Aug 2020 **Data Analyst Intern**, *Padoa*, Paris.

- Enriched Padoa database using Sql.
- Implemented a Python solution to check the sanity of the database.

Jan 2019 - May 2019 **Teacher**, *Edukaty*, Paris.
Teaching mathematics and physics for undergraduate students seeking admission to top college programs.

Sep 2018 - Apr 2019 **Social work volunteer**, *Le Rocher Oasis des cités*, Les Mureaux, France.
Accompanied suburban youth academically and socially.

Skills

Languages: English (full proficiency), French (native), Arabic (native), Japanese (beginner)

Programming: Proficient: Python. Prior Experience: SQL, Java, C++, MatLab.

Community work

Oct 2020 **Organizer and head of TIPE-X**.
Organized the first operation aimed at helping and guiding over 500 students in Lycée Moulay Idriss Fez Morocco for studies in French Grandes Ecoles.

Sep 2019 - Present **President of Arabix**.
Student association that introduces Arab culture to non-Arab students and ensures a dialogue with different cultures.

Apr 2019 - Present **Member of X-Maroc**.
Student association gathering Moroccan students at Ecole Polytechnique.

Outside Activities

Sports: Boxing, Soccer.

Hobbies: Gaming, Piano.