

AXEL BENYAMINE

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Education

UNIVERSITY OF CAMBRIDGE, Cambridge, UK

2024-Present

- Part III Master, specializing in Statistics and Probabilities
- 2nd best Mathematics University (QS 2023)
- Relevant coursework includes *Modern Statistical Methods*, *Statistical Learning*, *Information Theory*

ECOLE POLYTECHNIQUE, Palaiseau, FRANCE

2021-Present

- France's leading science and engineering university ("Grande Ecole")
 - A Master's level program, specialized in Applied Mathematics
 - Relevant coursework includes *Operational Research*, *Statistical Learning* and *Machine Learning*
- GPA: 3.87/4.00

LYCEE PRIVE SAINTE-GENEVIEVE, PREPARATORY PROGRAM, Versailles, FRANCE

2019-2021

- A **post-secondary** two-year program in advanced math and physics leading to nationwide entrance examinations to the Grandes Ecoles for scientific studies
 - Undergraduate coursework includes *Topology*, *Linear Algebra*, *Thermodynamics* and *Electromagnetism*
- GPA: 3.99/4.00

Project work

TEAM RESEARCH PROJECT (*EA Recherche*)

Sep-Dec 2023

→ Convergence of stochastic processes – Department of Applied Mathematics – Under the guidance of Asst. Prof.

Clement Rey – Study of dynamics in simulations of Ito processes

- Simulating Ito processes over extended time frames
- Proposing increasingly precise polynomial approximations as limits for simulated processes

EXPERIMENTAL PROJECT (*Modal*)

Feb-May 2023

→ Department of Applied Mathematics – Under the guidance of Asst. Prof. **Clement Rey**

- Research project on predicting the default risk of companies whose value follows a geometric Brownian motion
- Implemented statistical simulation methods for low probabilities in Python
- Simulated default risks using Monte Carlo, splitting and particle methods

SCIENTIFIC TEAM PROJECT (*PSC*)

Sep 2022-May 2023

→ Study of the mathematical game Dots and Boxes – Department of Applied Mathematics – Under the guidance of Asst.

Prof. **Lucas Gerin**

- Designed and implemented multiple solvers for the game Dots and Boxes
- Designed an innovative solver based on the MiniMax and Monte Carlo Tree Search algorithms

EXPERIMENTAL PROJECT (*TIPE*), Lycee prive Sainte-Genevieve, Versailles, FRANCE

Sep 2020-May 2021

→ Undergraduate research project on a public-key cryptography system based on the properties of the braid group, a mathematical group

- Implemented on Python an end-to-end public-key cryptography system whose security relies on the non-commutativity of the braid group

Internship

MASSACHUSETTS INSTITUTE OF TECHNOLOGY, Cambridge, MA, USA

Apr-Aug 2024

- Intern at Operation Research Center, under the supervision of Prof. Alexandre Jacquillat
– Infill development, design and optimization
- Developed optimization models and algorithms to support infill development in major cities, with the objective of maximizing a social welfare function
- Undertook data collection, model development, mathematical analysis, and computational activities

INFOSYS LIMITED, Bangalore, INDIA

Jun-Aug 2023

- Infosys Limited, EdgeVerve branch – AI branch specializing in business software development for companies
- Developed an AI tool to optimize the exchange of business information within a company
- Successfully devised an efficient system for extracting crucial information from business documents, reducing information extraction costs by 30% while maintaining quality
- Developed the extraction tool on Python utilizing OpenAI's API and Natural Language Processing models

NATIONAL GENDARMERIE – OFFICER CADET

Sep 2021-Mar 2022

- Part of Ecole Polytechnique's first year curriculum
- Assisted unit commander in drawing up emergency plans for riot control and prevention
- Took part in field operations (investigations, tracking of suspects, arrest of organized gang thieves)
- Dealt with cases of family abuse and battered children

Skills

- **Programming**
 - Python, Julia, Java, C++, SQL, Visual Studio, LaTeX
 - Machine Learning models: TensorFlow, PyTorch, Scikit-learn
- **Languages**
 - French (fluent), English (TOEFL: 103), Spanish (intermediate)

Awards

Awards

- Outstanding Leadership award bestowed by Ecole Polytechnique **2023**
- Outstanding Investment award for involvement in Ecole Polytechnique's student community **2023**
- Winner of the QuantumBlack AI Hackathon at Ecole Polytechnique on Greenhouse Gas Emission Reduction **2023**

French Olympiads of Mathematics

2018

- Gold Medal, Academy of Nice, FRANCE
- INRIA Gold Medal, Academy of Nice, FRANCE
- Ranked 41st nationally

Extracurricular activities

STUDENTS ASSOCIATIVE LIFE

- **Career Fair (X-Forum Association) – President** **2021-2023**
 - President of an association organizing an annual career fair gathering 150 companies and 2000 students
 - Association of 58 students with an annual turnover of €700,000
 - Managed the event organization, the coordination with companies, school administration, and service providers
 - Led the association's team with effective management
- **Ecole Polytechnique's Ecological Association (NeXt) – Conference organizer** **2022-2023**
 - Organized monthly conferences on ecological topics with researchers, experts, journalists, or industry professionals
 - Prospected potential speakers and organized the logistics of the events
- **Ecole Polytechnique's Welcome Week – Security Manager** **2023**
 - Ensured a safe environment, focusing on the prevention of sexual and gender-based violence
 - Made proactive measures that led to a secure and respectful event, creating a positive experience for all participants

TEACHING EXPERIENCE – Jussieu Neighborhood Center, Versailles, FRANCE

2019

- Helped struggling students from less privileged districts
- Assisted 8th and 9th grade students in organizing their homework and raising their academic ambitions

MISCELLANEOUS

- Basketball (6 hours per week at Ecole Polytechnique) and Squash (4 hours per week at Cambridge)
- Former member of the Youth Regional Parliament for the PACA region, FRANCE (2016-2019), and the Youth City Council of Cannes, FRANCE (2016-2018)