

# Léo le Douarec

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## WORK EXPERIENCE

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- Digital Infrastructure Intern** Jul 2025 — Aug 2025  
International Telecommunications Union (ITU) *Geneva, Switzerland*
- Implementing broadband mapping in 11 Sub-Saharan Africa countries, in partnership with the European Commission and European telecommunications regulatory agencies.
  - Desk research on best practices to implement national broadband mapping systems
- Machine Learning Research Engineer** Jul 2024 — Aug 2024  
Heptalytics *Paris, France*
- Training and evaluation of Graph Neural Networks to detect fraud, money laundering. Ethical use of personal banking data.
  - Made data processing 100 times faster by implementing efficient sparse-matrices for matrix product
  - Statistics, Geometric deep learning, Sparse matrices, Data Analysis. Python, NumPy, PyTorch, PyTorch Geometric.
- Data Scientist** Sep 2023 — Jul 2024  
Caisse d'Epargne *Nancy, France*
- Machine Learning and statistics on large-scale datasets
  - Proposed an index allowing to classify customers based on consuming habits, with encouraging results in first study, *while remaining GDPR-compliant*.
  - Interdisciplinary work with IT and marketing teams to produce large-scale data analysis and insights.
  - Project management, Python, Pandas, SKlearn, Folium, computing on a distant computer cluster (GRID'5000).

## EDUCATION

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- Master in Public Policy** Paris, France  
*Sciences Po Paris* *Sept 2024 — Graduate Aug 2026*
- Double-Degree with Mines Nancy in New Technologies and Public Policy.
  - Connecting social sciences, ethics, public policy and new technologies
  - Coursework: Economics of digital markets, Psychology, Sociology of the Digital Public Space, Diplomacy, Digital Law, Digital policies for local governments, Blockchain for Public Good, Global Security Law and New Technologies.
- MSc Engineering, Applied Mathematics / Diplôme d'ingénieur** Nancy, France  
*École des Mines de Nancy, Université de Lorraine* *Sept 2022 — Graduate Aug 2026*
- Cumulative GPA: 3.9/4.0
  - Statistics Coursework: Deep Learning, Machine Learning, Computer Vision, Statistics, Data Analysis, Inverse Problems, Time Series analysis.
  - Physics Coursework: Quantum Physics, Statistical Physics, Fluid Mechanics. Basics of Quantum computing.
  - MiT MOOC on Ethics, Economics, Experimental Economics, Introduction to Law
- BSc Mathematics, Physics, Computer Science** Rennes, France  
*Lycée Chateaubriand* *Sept 2020 — Aug 2022*
- Cumulative GPA: 4.0/4.0. 2-year undergraduate program preparing for national competitive exams to enter French most prestigious engineering graduate schools
  - Relevant coursework: Linear Algebra, Calculus, Probabilities, Functional Analysis, Signal Processing, Optics

## SELECTED PROJECTS

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- Public Policy Incubator, Sciences Po** Jan 2025 — May 2025
- Project on digital law and ethics in partnership with french regulatory body CNIL
  - Currently working on how to fairly develop and monitor the use of algorithms in the public sector
- Research Project, Biases in Artificial Intelligence** ([https://github.com/Lyreck/resume\\_biases-analysis](https://github.com/Lyreck/resume_biases-analysis)) Jan 2025 — May 2025
- Project on algorithmic biases and ethics with Jean-Philippe Cointet (Sciences Po, Medialab)
  - Developing and implementing a research methodology to test biases in Automatic Resume screening systems (ATS).

**Research project, Computational Sociology** ([github.com/pouvoirasha/sociology\\_scrapping](https://github.com/pouvoirasha/sociology_scrapping)) Autumn 2024 —

- Collected, processed 30k comments across YouTube, TikTok, Reddit using webscraping and APIs
- Analyzed the collected data with Pandas, Seaborn
- Finetuned a state-of-the art sentiment analysis model on TikTok-specific vocabulary
- Sociology research and innovation; teamwork

**Hackathon, Open Sky Network Contest** ([github.com/Hadrien-Cr/ATOW\\_ML](https://github.com/Hadrien-Cr/ATOW_ML)) Autumn 2024 —

- Machine Learning contest to predict take-off weight of airplanes. Tuned XGBoost models
- Project lead in autonomy, teamwork, open-source

**Research project** ([github.com/Lyreck/graph\\_optimization](https://github.com/Lyreck/graph_optimization)) Spring 2024 —

- Built a mathematical model to optimize usage of an airport using an interval graph coloring approach and a sequential graph coloring algorithm with  $O(n \log n)$  time complexity

**Research project, model checking** Sept 2021 — Jul 2022

- Worked with Nicolas Markey on Büchi automaton and Linear Temporal Logic (LTL) to perform model checking.
- OCaml implementation of an algorithm from the litterature to construct a model-checking Automaton.

## SKILLS

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- **Programming Languages:** Python, OCaml, SQL, MongoDB, R, Matlab, VBA
- **Python Libraries:** PyTorch, PyTorch Geometric, Keras, TensorFlow, NumPy, Scikit-Learn, OpenCV, Pandas, Seaborn, SciPy, Multiprocessing, Selenium, Requests
- **Technologies:** Git, Linux, Excel, Graph Neural Networks, Catia V5, Typst, LaTeX, HPC, HuggingFace AutoTrain, ollama
- **Scientific experience:** Natural Language Processing, Computer vision, Deep learning, Transformers, Data Science, Optimization, Operations Research, Mathematics (Linear algebra), Fluid Mechanics, Quantum Physics and Mechanics
- **Languages spoken:** French (native), English (native), Chinese (B1 HSK3), German (B1)

## EXTRACURRICULAR ACTIVITIES

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### Music

- > 16 years of Trombone in demanding conservatories
- Supervized two orchestras as conductor and composer
- Organized 5 concerts throughout the year
- Currently trombonist at OCUP Paris, Orchestre de Sciences Po (COSP), Fanfare Bleu Jonquille.

### Badminton, Sailing, Cycling, Drone Piloting, PC building

### Tutor in Mathematics, Climate fresk facilitator

## VOLUNTEERING EXPERIENCE

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### Paris 2025 AI Action Summit

- took part in the organization of the Paris 2025 AI Action Summit
- accompanied and helped high-level visitors throughout the day.

### Les Cordées de la Réussite

- Tutored students aged between 11 and 15 years old in Mathematics, French, English while in engineering school
- Focused on children with specific difficulties
- Presented the work at the steering committee.

### Climate Fresk Animator

- I have followed the training and can autonomously organize a climate fresk to raise awareness on climate change.

### French Red Cross

- Took part in food bank collections