Nathan Boudol

Applied Mathematics & Data Science
Final Year Master's Student
Seeking an internship starting February 2026

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Education

ENSIMAG – Grenoble INP / Grenoble Alpes University *2024–2026*
Master of Applied Mathematics, Minor in Data Science
▷ Courses: Applied probability and statistics, geometric modeling, PDEs, numerical analysis, convex optimization, and machine learning.

Savoie Mont-Blanc University, Bourget-du-Lac *2023–2024*
Bachelor's Degree in Mathematics & Computer Science
▷ Mathematics: Measure theory, differential calculus, integration.
▷ Computer science: Python, C, formal methods (Coq), databases, numerical analysis.

Grenoble INP – Phelma, Grenoble *2020–2022*
Engineering School in Physics, Electronics and Materials
▷ Focus: modeling, quantum mechanics, statistical physics, thermodynamics, materials processes.

Lycée Berthollet, Annecy *2017–2020*
Classes Préparatoires aux Grandes Écoles (MP)*
▷ Three-year intensive undergraduate program in mathematics and physics; ranked **1st** in mathematics in final year.

Lycée Louis-Lachenal, Argonay *2017*
Scientific Baccalauréat (High Honours)

Research Experience

D-Lab, University of California, Berkeley *June–Sep 2025*
Research Intern – Evaluation of LLMs in Hate Speech Annotation
Advisor: Dr. Pratik Sachdeva, Senior Research & Data Scientist

- Evaluated state-of-the-art LLMs for hate speech annotation by querying APIs on social media corpora.
- Applied Rasch measurement theory (partial credit model) to measure annotator bias and severity calibration.
- Contributed to reliability analysis and cross-model calibration frameworks for annotation systems.

Personal Research Project *2024–Present*
Computational Modeling of Blockchain Networks and Consensus Vulnerabilities

- Research on the modeling of blockchain networks and block arrival, propagation dynamics.
- Applied nonparametric kernel methods for instantaneous difficulty $\lambda(t)$ evaluation in the Bitcoin network.
- Built a data-driven model coupling $\lambda(t)$, propagation delay, mining power and the proportion of corrupted nodes to characterize the stability / vulnerability of proof-of-work consensus.
- Designed a simulation in Python to identify critical hashrate and corruption thresholds enabling successful selfish-mining attacks.

Technical Projects

Full details available at nathanboudol.fr.

DeFi Vault for Hedged Uniswap v3 Concentrated Liquidity Position (deployed on Sepolia testnet):

- DeFi vault contract using multiprotocols for hedging one-sided Uniswapv3 cLP positions using delta-neutral and options-style strategies.
- Based on cLP's being short γ (gamma).
- Inspired by the research of Guillaume Lambert (Cornell University).

Machine Learning & Data Science

- **NN Project :**Built a Neural Network from scratch, without any librairies, in **C++**.
- **Financial Time Series Forecasting:** Used different machine learning models to predict stock prices, and compared them.
- **Urban Mobility Optimization:** Used Data Analysis methods to optimize station placements, capacity, and the overall traffic flow. (data used : velib' in Nantes)
- **NLP:** Built a graph-based algorithm to extract key sentences from a document.

Hackathon - ENSIMAG Finance x Morgan Stanley

- Our team finished $7^{th}/45$. The goal was to create an algo. trading the GBPEUR on Brexit day.

Professional Experience

Superprof (+1000h) *2021–Present*
Private Tutor – Mathematics, Physics & Computer Science
- Focus on developing reasoning, problem-solving, and exam preparation strategies.
- It improved my communication, adaptability, empathy and my overall knowledge.

Summer Jobs
- In different companies - mainly working in teams.

Technical Expertise

Programming	**Python (adavanced)** : NumPy, pandas, matplotlib, scikit-learn, PyTorch – C/C++, R, SQL, Solidity, CUDA
Tools & Platforms	VSCode, PyCharm, Git/GitHub, Jupyter, Linux/Unix, LaTeX, Docker, PowerBI, Excel, SSH Servers
Research Skills	Mathematical modeling, statistical inference, machine learning, numerical analysis, scientific computing

Interests & Activities

Gliding, archery, golf, road cycling, horology, personal research project, continuous learning