

Mehdi Makni

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EDUCATION

- **Massachusetts Institute of Technology** Cambridge, Massachusetts
PhD candidate, MIT Operations Research Center, GPA 5.0/5.0 **Sep 2023 - May 2028**
 - Advised by Prof. Rahul Mazumder.
 - **Coursework:** Linear Optimization, Fundamentals of Probability, Non-linear Optimization, Non-asymptotic High dimensional Statistics, TinyML & Efficient Deep Learning, Statistical Learning Theory & Applications, Bayesian Modeling & Inference, Algebraic Techniques & Semidefinite Optimization.
- **École Polytechnique** Palaiseau, France
Bachelor of Science, Mathematics and Computer Science, Valedictorian with GPA 4.24/4.3 **Sep 2019 – Jun 2022**
 - **Bachelor Thesis:** Uncertainty Quantification in Federated Learning, [link](#).
 - **Relevant Coursework:** Machine Learning, Design and Analysis of Algorithms, Networks, Logic and Proofs, Computer Architecture, Probability, Statistics, Mathematical Modeling, Convex Optimization and Optimal Control, Concurrent and Distributed Computing, Numerical methods for ODEs.
- **ETH Zurich** Zurich, Switzerland
Exchange semester at D-MATH (Mathematics Department), GPA 5.42/6.0 **Sep 2021 – Feb 2022**
 - **Coursework:** Advanced Machine Learning, Randomized Algorithms & Probabilistic Methods, Probability Theory.

RESEARCH & INDUSTRY EXPERIENCE

- **Citadel** New York, USA
Quantitative Research Intern – Data Strategies Group **Jun 2026 - Aug 2026**
- **Amazon** Seattle, USA
Applied Scientist Intern – Gen AI and Large Language Models **May 2025 - Aug 2025**
 - Built a multi-modal framework within Amazon Pharmacy that integrates customer journey data (notifications, call transcripts, prescriptions, shipments, etc.) and powers different products including customer care call resolution, personalized questions for Amazon Pharmacy’s chatbot landing page, and improves different classification tasks using the customer’s multi-modal embeddings.
 - Flagged fraudulent customers’ activities with the framework built above showcasing a use case for outlier detection using LLMs. The 2 accounts flagged were reported to compliance and closed upon further inspection.
- **Lagrange Mathematics and Computing Research Center** Paris, France
Research Engineer, Fixed-term contract, Full-time **Aug 2022 - Feb 2023**
 - Published a paper at **ICML’23** under the supervision of Professors Éric Moulines and Maxim Panov.
 - Source: <https://proceedings.mlr.press/v202/plassier23a.html>.

PAPERS

- 3BASiL: An Algorithmic Framework for Sparse plus Low-Rank Compression of LLMs **NeurIPS’25**
 - **Mehdi Makni**, Xiang Meng, Rahul Mazumder
 - Poster acceptance at Workshop on robust statistics – Columbia University.
- TSENOR: Highly-Efficient Algorithm for Finding Transposable N: M Sparse Masks **NeurIPS’25**
 - Xiang Meng, **Mehdi Makni**, Rahul Mazumder
- An Optimization Framework for Differentially Private Sparse Fine-Tuning **KDD’25**
 - **Mehdi Makni**, Kayhan Behdin, Gabriel Afriat, Hussein Hazimeh, Zheng Xu, Sergei Vassilvitskii, Natalia Ponomareva, Rahul Mazumder
 - Poster acceptance at NYC Privacy Day at Google – Fall 2024.
 - Poster acceptance at workshop TPDP 2026 - Theory and Practice of Differential Privacy.
- A Unified Framework for Sparse plus Low-Rank Matrix Decomposition for LLMs **CPAL’25 (Oral)**
 - **Mehdi Makni**, Kayhan Behdin, Zheng Xu, Natalia Ponomareva, Rahul Mazumder
- Conformal Prediction for Federated Uncertainty Quantification Under Label Shift **ICML’23**
 - Vincent Plassier*, **Mehdi Makni***, Aleksandr Rubashevskii, Eric Moulines, Maxim Panov
 - *Equal contribution.

ACHIEVEMENTS & AWARDS

- **Excellence Scholarship Recipient**, Fondation de l'École Polytechnique – 4K EUR/year **2019-2022**
 - Awarded in my first year for admission with honors and renewed for two years.
- **Second Prize IMC**, International Mathematics Competition 2021 **Aug 2021**
- **Honourable Mention IMO**, International Mathematical Olympiad 2018 **Jul 2018**
- **Gold Medal PAMO**, Pan African Mathematical Olympiad 2018 **Jun 2018**

OTHER

- **Programming:** – *Proficient:* Python, PyTorch. – *Prior experience:* C/C++, Julia, R.
- **Languages:** – *Fluent:* English, French, Arabic. – *Notions:* German.
- **Community Outreach:**
 - Treasurer: MIT INFORMS Student Chapter 2023-2024.
 - Reviewer: NeurIPS'25.
- **Citizenship:** French – Tunisian.