Abdessamad El Kabid

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Education

Ecole Polytechnique **Palaiseau, France** **Sep 2022 | Present**

- One of France's top schools for science & engineering.
- Specializing in a Master's level program in Applied Mathematics.
  Relevant coursework: *Operations Research, Statistics, Optimization, Machine & Deep Learning, Computer Vision, Natural language processing, Data Science, Design and analysis of Algorithms, Stochastic Processes, Markov Chains and Martingales.*
  Cumulative GPA: 3.92/4.0

Lycée Al Zahrawi **Preparatory Program** **Sep 2020 | Jun 2022**

- Two-year post secondary program in advanced Mathematics, Physics and Computer Science leading to nationwide entrance examinations to the Grandes Ecoles for scientific studies.
- Relevant coursework: *Real and Complex Analysis, Probability Theory, Algebra, Topology, Computer Science, Data Structures and Algorithms, Physics.*
  GPA: 4.0/4.0

Research Work

Research project, Center for Applied Mathematics (CMAP)- Ecole Polytechnique **Sep 2024 | Present**

- Under the supervision of Prof. Stephane Gaubert and Prof. Frederic Meunier.
- Designing a Near-Optimal Online Algorithm to optimize the use of a battery with unknown client demand, and find the competitive ratios in both deterministic and stochastic settings.
- Working on Online threshold algorithms and Online Fractional Multidimensional Knapsack problem.

Independent research, CMAP **Jun 2024 | Present**

- Collaborating with Prof. El Mahdi El Mhamdi.
- Investigating the impact of label flipping attacks on federated learning systems under various defense mechanisms.
- Derived and proved the optimality of an attack algorithm in case the server uses the mean to aggregate gradients.
- Analyzing to what extent can label flipping attacks approach gradient-based attacks.
  (**Paper in preparation**)

Research project, CMAP - Ecole Polytechnique **Jun 2023 | May 2024**

- Under the supervision of Prof. El Mahdi El Mhamdi.
- Investigated the combined effects of scaling the capacity of the model and data poisoning on the model's performance and robustness.
- Designed an algorithm to slow down training under specific assumptions.

Experimental and research work, Ecole Polytechnique **Feb 2024 | May 2024**

- Worked on Point Cloud Sampling algorithms.
- Implemented an efficient, incremental neighbor graph construction algorithm to maintain graph updates as data points are added

Industry Experience

HSBC, Research Scientist Intern — **Paris, France** — **Jun 2024 | Sep 2024**

- Conducted research on state-of-the-art agentic design patterns.
- Implemented my findings as methods in their application which led to a 12% improvement in performance.
- Report here: Report

NLP Engineer, Part-time — **Paris, France** — **Mar 2024 | Jun 2024**

- Developed an LLM-powered application for transportation services, improving customer experience with real-time insights.

Teaching Experience

Paris Cité University, Teaching Assistant — **Paris, France** — **Sept 2024 | Present**

- Teaching Linear Algebra, Real Analysis, and Probability theory to second-year undergraduates.

Ecole Polytechnique, Teaching Assistant — **Paris, France** — **Oct 2023 | May 2024**

- TA in Algebra and Galois Theory course.

Achievements and Awards

- **Moroccan merit scholarship for outstanding results in entrance examination.** 2022
- **Al Zahrawi Excellence Scholarship: Full undergraduate funding for top highschool students in Morocco.** 2020

Skills

- **Languages**: Fluent: English . Native: French, Arabic
- **Programming** : Java, Python, C++, JavaScript.
- **Frameworks and technologies**: NumPy, pandas, scikit-learn, PyTorch, TensorFlow, Azure AI Services, Git, Docker

Outside activities and Community Work

- **Sports**: Swimming (Member of the school's team), Basketball.
- **Associative**: Volunteering: Member of Maths & Maroc, an NGO dedicated to the preparation of Moroccan high school students to international mathematical competitions in partnership with the Ministry of education.