Brahim Erraji

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EDUCATION

Université de Lille — Lille, France
PhD Candidate in Machine Learning (Focus: Fairness in Distributed Machine Learning) — 2023 – Present

- Researching bias towards demographic groups in predictions of machine learning models trained on decentralized data.

Mohamed Bin Zayed University of AI — Abu Dhabi, UAE
Master of Science in Machine Learning (GPA: 3.8/4) — 2021 – 2023

Mohammed VI Polytechnic University — Benguerir, Morocco
Bachelor of Science in Data Science (Top of Class) — 2018 – 2021

EXPERIENCE

INRIA — Lille, France
PhD candidate — 2023 – Present

- Developing novel algorithms for fairness in distributed machine learning and integrating them to DecLearn (Python library to perform distributed machine learning).
- Accepted papers at top-tier conferences (AISTATS, CAp) demonstrating research impact.

CISPA Helmholtz Center for Information Security — Saarbrucken, Germany
Visiting Researcher — 2022

- Researched **heterogeneous federated learning**, specifically tackling non-IID local objectives.
- Investigated robustness against Byzantine worker attacks in distributed training setups.

P-Curiosity Lab (UM6P) — Benguerir, Morocco
Machine Learning Intern — 2021

- Developed a Deep Learning model to classify satellite images of Moroccan regions into 5 economic activity classes.
- Optimized data pipeline for processing large-scale geospatial datasets.

PUBLICATIONS

Equalized Loss Gaps for Fairness in Heterogeneous Federated Learning
Accepted to AISTATS 2026 (Main Track)

Fairness-aware Reweighting in Federated Learning
Accepted to CAp 2024 (Conférence sur lApprentissage Automatique CAp)

FLECS-CGD: A Federated Learning Second-Order Framework
Accepted to NeurIPS 2022 Workshop (HOOML2022: Order up!)

TECHNICAL PROJECTS

Personalized Learning with Harmful Workers | *MSc Thesis* — 2023

- Designed a mechanism to find optimal adaptive weights for stochastic gradient descent in Federated Learning.
- Implemented custom simulation environments in **PyTorch** and **Scikit-learn**.

News Recommendation Engine | *Full Stack Engineering* — 2021

- Built a relational database to store user preferences and reading habits for customized news feeds.
- Implemented backend in **Django** and data collection using **BeautifulSoup/Selenium**.

SKILLS

Frameworks & Libraries : PyTorch, TensorFlow, Scikit-learn, Pandas, NumPy, Django
Languages : Python, C, C++, SQL, PHP
Developer Tools : Git, Docker, LaTeX, Microsoft Word, Linux/Bash