Brahim Erraji

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Profile

PhD student at INRIA Lille, my research interests lay at the intersection of fairness and distributed machine learning. The goal of my PhD is to study the bias towards demographic groups in the predictions of models trained on decentralized data.

Education

Program	Institution/Board	%/CGPA	Year
PhD (Fairness in Federated Learning)	INRIA *Lille, France*		2023-
Masters MSc (Machine Learning)	Mohamed Bin Zayed University of AI *Abu Dhabi, UAE*	**3.80/4**	2021-2023
Bachelor's degree BSc (Data science)	Mohammed VI Polytechnic University *Benguerir, Morocco*	**17/20**	2018-2021

Work Experience

1. ***Research visit at The CISPA Helmholtz Center for Information Security in Saarbrucken, Germany.***

- Working on heterogeneous federated learning: non-IID local objectives./Byzantine workers issues

2. ***Intern at P-Curiosity lab at UM6P in Benguerir, Morocco.***

- Trained a deep learning model to classify publically available satellite images of of the region of Morocco to one of 5 economic activity classes.

Publications

- Equalized Loss Gaps for Fairness in Heterogeneous Federated Learning (*Accepted to AISTATS 2026 main track conference*)
- Fairness-aware Reweighting in Federated Learning (*Accepted to CAp 2024* Conference)
- FLECS-CGD: A Federated Learning Second-Order Framework via Compression and Sketching with Compressed Gradient Differences (*Accepted to NeurIPS 2026 Workshop (Order UP!)*)

Course Work

MSc Core and elective course

- Machine learning: Introductory course to different learning algorithms and their applications
- Advanced Machine learning: Advanced course covering concepts such as statistical complexity of ML models and reinforcement leaning
- Optimization: Course covering different concepts in optimization theory: zero, first and higher orders along with convergence proofs for different known optimization methods

Course Projects

1. ***Personalized learning with the existence of harmful workers*** **MSc Thesis**

- Designed a mechansim to find the best adaptive weights to apply the SGD step in federated learning

2. ***Line-search based Accelerated Gradient Method for Composite Objective Function*** **2nd Semester**
MSc *MSc*

- Surveyed work in accelerated method for composite functions, Ran experiments with a recent method in different settings and provided potential proof for the estimate sequence lower bound.

3. ***Solar Cell Defect Classification via Electroluminescent Images*** **1st semester**
MSc *MSc*

- Used different feature extraction techniques along with different classifers to classify solar cells as defective or non defective

4. ***Web application for news recommendation***
(BSc) *BSc*

- Implemented a relational database to store users data, and display customised news articles from different sources according to user preferences and reading habits.

Technical Skills

- Code: C, C++, Python (Test-driven developement)
- DL libraries: Pytorch, TensorFlow, sckit-learn
- Web Technology: Php, Django
- Tools: Git, Latex, Docker, Microsoft Word

Extra-curricular

- Reviewer for Neurips and AISTATS Conference
- Mentor in MBZUAI Executive Program (Facilitating workshops and discussions around AI implementation with key decision-makers from leading UAE organizations.)
- Was president of the chess club at UM6P and MBZUAI

Achievements/Awards

- Graduated Top of Class in Bachelor's
- 4th Place in Data Science for Sports Hackathon at UM6P in 2021
- Receiver of Moroccan Government Excellence Scholarship
- Receiver of MBZUAI Excellence Scholarship

Others

- Interests: Chess, Sports, Reading
- Languages: Arabic, French, English