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Research Interest

My research interest lies in providing theoretical understanding of federated learning systems. Inspired by the theoretical insights, I seek to design large-scale distributed/federated learning algorithms that can efficiently exploit data and system resources, with a specific attention to fairness and robustness. My research is characterized by the application of mathematical tools from distributed optimization and statistical learning theory.

Education

2020–present **Ph.D. in computer science**, *Sophia-Antipolis, France*, Inria, Université Côte d'Azur
Advisor: Giovanni Neglia
Thesis: Tackling Heterogeneity in Federated Learning Systems
Funding: Accenture Labs

2018–2019 **MS, MVA: Mathematics, Computer Vision, Machine Learning**, *ENS Paris-Saclay*, Cachan, France

2016–2019 **MS, Applied Mathematics**, *ENSTA Paris*, Palaiseau, France

2014–2016 **Classes Prépas**, *Lycée Ibn-Abdoun*, Khouribga, Morocco

Publications

Marfoq, Othmane, Giovanni Neglia, Laetitia Kameni, and Richard Vidal. Personalized federated learning through local memorization. In *Proceedings of the 39th International Conference on Machine Learning*, Proceedings of Machine Learning Research. PMLR, 2022.

Jean Ogier du Terrail, Samy-Safwan Ayed, Edwige Cyffers, Felix Grimberg, Chaoyang He, Regis Loeb, Paul Mangold, Tanguy Marchand, **Marfoq, Othmane**, Erum Mushtaq, Boris Muzellec, Constantin Philippenko, Santiago Silva, Maria Teleńczuk, Shadi Albarqouni, Salman Avestimehr, Aurélien Bellet, Aymeric Dieuleveut, Martin Jaggi, Sai Praneeth Karimireddy, Marco Lorenzi, Giovanni Neglia, Marc Tommasi, and Mathieu Andreux. Flamby: Datasets and benchmarks for cross-silo federated learning in realistic settings. 2022.

Marfoq, Othmane, Giovanni Neglia, Aurélien Bellet, Laetitia Kameni, and Richard Vidal. Federated multi-task learning under a mixture of distributions. In *Advances in Neural Information Processing Systems*, volume 34, 2021.

Marfoq, Othmane, Chuan Xu, Giovanni Neglia, and Richard Vidal. Throughput-optimal topology design for cross-silo federated learning. In *Advances in Neural Information Processing Systems*, volume 33, 2020.

Work Experience

2019 **Research Intern**, *Smiths Detection*, Vitry-sur-Seine, France

2018 **Research Intern**, *Lixoft*, Antony, France

Teaching

2022 Optimization for Machine Learning, **15 hours** (2 lectures + 3 practical sessions)

2021 Machine Learning: Theory and Algorithms (MALTA), **3 hours** (1 lecture)

2021 Optimization for Machine Learning, **12 hours** (4 practical sessions)

2020 Distributed Optimization and Games, **6 hours** (2 practical session)

Oral Presentations

2022 **GDR RSD thematic day on distributed learning**, *Personalized Federated Learning through Local Memorization*

2021 **FL-ICML'21**, *Federated Multi-Task Learning under a Mixture of Distributions*

2020 **SophI.A summit**, *Throughput-Optimal Topology Design for Cross-Silo Federated Learning*

Service and Activities

I am serving/served as reviewer for: International Conference on Artificial Intelligence and Statistics (AISTATS'22), International Conference on Machine Learning (ICML'22), Neural Information Processing Systems (NeurIPS'22), IEEE Transactions on Mobile Computing

I am participating and leading a series of round table on federated learning in the context of ICAIR (Industrial Council of Artificial Intelligence Research)