

2022 Workshop on

# Federated Learning

Monday 25 April 2022

Lagrange Mathematics and Computation  
Research Center

<https://www.lmcrc.fr>

Organizers:

Éric Moulines, Mérouane Debbah, and Samson Lasaulce

► To join on Zoom on April 25:

<https://us02web.zoom.us/j/82836398581>

## Program (Chairs : É. Moulines/S. Lasaulce)

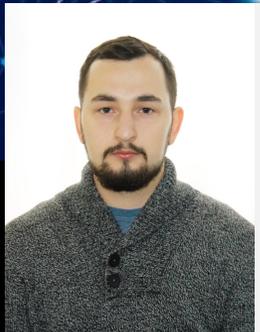
Schedule (Paris time)	Topic	Speaker
9:25 am - 9:30	Welcome and introduction speech	Éric MOULINES
09:30 - 10:30	"ProxSkip: Yes! Local Gradient Steps Provably Lead to Communication Acceleration! Finally!"	Peter RICHTARIK
10:30 - 11:30	"Doubly Stochastic Voronoi Vector Quantization, with applications to federated learning"	Aymeric DIEULEVEUT
11:30 - 12:30	"Optimization algorithms for heterogeneous clients in Federated Learning"	Mehryar MOHRI
12:30 - 2:00	----- Lunch Break -----	
2:00 - 3:00	"Secure Distributed Training at Scale"	Eduard GORBUNOV
3:00 - 4:00	"Collaborative Learning with Strange Gradients"	Martin JAGGI
4:00 - 5:00 pm	"Improving the Privacy-Accuracy-Communication Tradeoffs in Federated Learning"	Peter KAIROUZ

Invited speakers' biographies →

# Biographies of the invited speakers (1/2)



**Peter RICHTÁRIK** is a professor of Computer Science at the King Abdullah University of Science and Technology (KAUST), Thuwal, Saudi Arabia, where he leads the Optimization and Machine Learning Lab. At KAUST, he has a courtesy affiliation with the [Applied Mathematics and Computational Sciences](#) program and the [Statistics](#) program, and is a member of the [Visual Computing Center](#), and the [Extreme Computing Research Center](#). Prof. Richtárik is a founding member and a Fellow of the [Alan Turing Institute \(UK National Institute for Data Science and Artificial Intelligence\)](#), and an [EPSRC Fellow in Mathematical Sciences](#). During 2017-2019, he was a Visiting Professor at the Moscow Institute of Physics and Technology. Prior to joining KAUST, he was an Associate Professor of Mathematics at the University of Edinburgh, and held postdoctoral and visiting positions at Université Catholique de Louvain, Belgium, and University of California, Berkeley, USA, respectively. He received his PhD in 2007 from Cornell University, USA. Prof. Richtárik's research interests lie at the intersection of mathematics, computer science, machine learning, optimization, numerical linear algebra, and high-performance computing. Through his work on randomized and distributed optimization algorithms, he has contributed to the foundations of machine learning, optimization, and randomized numerical linear algebra. He is one of the original developers of [Federated Learning](#). Prof. Richtárik's works attracted international awards, including a Best Paper Award at the NeurIPS 2020 Workshop on Scalability, Privacy, and Security in Federated Learning, Distinguished Speaker Award at the 2019 International Conference on Continuous Optimization, SIAM SIGEST Best Paper Award, and the IMA Leslie Fox Prize.



**Eduard GORBUNOV** obtained his PhD degree in December 2021 at Moscow Institute of Physics and Technology, Phystech School of Applied Mathematics and Informatics where he worked under the supervision of professors Alexander Gasnikov and Peter Richtárik. His research interests include Stochastic Optimization and its applications to Machine Learning, Distributed Optimization, Derivative-Free Optimization, and Variational Inequalities. Currently he is a junior researcher at MIPT (Russia) and a research consultant at Mila (Canada).



**Aymeric DIEULEVEUT** is an assistant professor in Statistics at École Polytechnique, Palaiseau, France, in the Department of applied mathematics. His main research interests are statistics, optimization, stochastic approximation, federated Learning, high-dimensional learning, non-parametric statistics, scalable kernel methods. Before joining École Polytechnique he was a postdoctoral Researcher at [EPFL](#) (Ecole Polytechnique Fédérale de Lausanne), in the [MLO team](#), directed by Martin Jaggi. Before that, he was a Ph.D. student in the [Sierra Team](#), which is part of the DI/ENS ([Computer Science Department](#) of [École Normale Supérieure](#)). He was supervised by [Francis Bach](#). He graduated from École Normale Supérieure de Paris (Ulm) in 2014 and got a Master Degree in Mathematics, Probability and Statistics (at Université Paris-Sud, Orsay). From March to August 2016, he was a visiting scholar researcher at University of California Berkeley, under the supervision of [Martin Wainwright](#).



**Mehryar MOHRI** is the Head of the Learning Theory Team at Google Research and a Professor at the Courant Institute of Mathematical Sciences. His research covers a number of different areas in machine learning and theoretical computer science, in which he has published extensively. His algorithms in machine learning and speech recognition have been adopted in many applications and products. He is the author of the reference book Foundations of Machine Learning used in several machine learning graduate courses in universities and corporate research laboratories. He is an editorial board member of multiple machine learning and theoretical computer science journals and currently serves as the President of the Association for Algorithmic Learning Theory and the Head of the Steering committee.

## Biographies of the invited speakers (2/2)



**Martin JAGGI** is a Tenure Track Assistant Professor at EPFL, heading the Machine Learning and Optimization Laboratory. He received the M.S. degree in mathematics and the Ph.D. degree in computer science from Eidgenössische Technische Hochschule Zürich, Zürich, Switzerland, in 2006 and 2011, respectively. He was a Research Fellow with the Simons Institute, Berkeley, CA, USA, and a Post-Doctoral Researcher with the École Polytechnique, Paris, France. He is a Co-Founder of SpinningBytes, Zurich, Switzerland and the Founder of the Zurich Machine Learning and Data Science Meetup, Zurich. Since 2016, he has been a Tenure Track Assistant Professor with the École Polytechnique Fédérale de Lausanne, Lausanne, Switzerland, heading the Machine Learning and Optimization Laboratory. His research interests include machine learning, optimization, and text understanding.



**Peter KAIROUZ** is a research scientist at Google, where he leads research efforts on distributed, privacy-preserving, and robust machine learning. Prior to joining Google, he was a postdoctoral research fellow at Stanford University, and before that, he was a PhD student at the University of Illinois Urbana-Champaign (UIUC). He is the recipient of the 2012 Roberto Padovani Scholarship from Qualcomm's Research Center, the 2015 ACM SIGMETRICS Best Paper Award, the 2015 Qualcomm Innovation Fellowship Finalist Award, and the 2016 Harold L. Olesen Award for Excellence in Undergraduate Teaching from UIUC.