CONSTANTIN PHILIPPENKO, PH.D.

Postdoctoral researcher at Inria Paris and DI ENS

Docteur en Mathématiques Appliquées de l'École polytechnique | @ cphilippenko@gmail.com | Paris, France

WORK EXPERIENCES

Postdoctoral researcher

Inria Paris, DI ENS

October 2023 – Ongoing | Paris, France

Under the supervision of Laurent Massoulié and Kevin Scaman

- Decentralized methods for unsupervized learning.
- Collaboration with CEA Saclay and the Cédric Gouy-Pailler's team.

Ph.D. student in Federated Learning

École polytechnique, CMAP Laboratory

Dec 2019 – June 2023 | Palaiseau, France

Under the supervision of Eric Moulines and Aymeric Dieuleveut

- Bidirectional compression for federated learning in heterogeneous setting.
- Collaboration with Accenture Labs in Sophia-Antipolis.
- Machine learning | Python - Pytorch | Quantization | GPU

Java Consultant

Global Market Solution

Feb 2018 – Dec 2019 | London (UK) and Paris (France)

Development of informatics tools devoted to extract valuable information from massive volume of financial data. Consultant at:

- Société Général, Jun 2019 – Nov 2019, Paris.
- HSBC, Oct 2018 – Jun 2019, London.
- ActiveViam, Feb - Jul 2018, London (Internship).
- ActivePivot | Java | Jenkins | OLAP Cube | Agile method

R&D Internship in machine learning

Forecsys

May 2017 – Jul 2017 | Moscow, Russia

- Algorithms for time series recognition based on machine learning.
- Python | Scikit-Learn | Linux

R&D Internship on polymers

Conservatoire national des arts et métier

Spring 2015 | Paris, France

Research on the industrial use of polymers.

TEACHING EXPERIENCES

Lecturer at École polytechnique, Paris 2020-2024

Machine learning, Optimization, Deep Learning, Probability, Linear Algebra.

Lecturer at Emines, Ben Guerir, 2022

Supervising students during their final internship ("PFE").

Lecturer at Lycée Stanislas, Paris, 2018-2023

Remedial courses in Mathematics for Middle School

EDUCATION

École polytechnique

Ph.D. in Applied Mathematics.

2019 – 2023 | Palaiseau, France

Distributed optimization, federated learning, compression, data heterogeneity.

Ensimag

Applied Mathematics, 3D Animation.

2015 – 2018 | Grenoble, France

French engineering school "Grande École" in computer science and applied mathematics.
GPA: 3.84/4 (French system: 15.29/20).

Moscow Institut of Physics and Technologies

Machine Learning, Statistiques.

Spring 2017 | Moscow, Russia

Lycée Saint-Louis

Mathematics, Physics.

2013 – 2015 | Paris, France

Preparatory classes for competitive entrance examinations to French "Grandes Écoles".

PROJECT MANAGEMENT

Congress of Applied Mathematics
President and founder of the CJC-MA 2021 (*Congress of Young Researcher in Applied Mathematics*), École polytechnique, October 2021.

Phantasio - Music and Show Collective
President and Founder.

Doctoral students' delegate
CMAP Laboratory, 2021-2022

Member of the French SMAI
Société de Mathématiques Appliquées et Industrielles, since 2020.

Water-Polo in competition
Nice, Grenoble, Moscou, Paris.

Scouting
2005-2022

LANGUAGES

French
English
Russian
German

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PUBLICATIONS

Constantin Philippenko, Kevin Scaman and Laurent Massoulié, In-depth analysis of low-rank matrix factorisation in a federated setting, 2024, *Not yet submitted.*

Constantin Philippenko and Aymeric Dieuleveut, Convergence rates for distributed, compressed and averaged least-squares regression: application to federated learning, 2024, *JMLR.*

Jean Ogier du Terrail et al., FLamby: Datasets and Benchmarks for Cross-Silo Federated Learning in Realistic Healthcare Settings, 2022, *Thirty-sixth Conference on Neural Information Processing Systems Datasets and Benchmarks Track.*

Constantin Philippenko and Aymeric Dieuleveut, Preserved central model for faster bidirectional compression in distributed settings, 2021, *Advances in Neural Information Processing Systems, 34.*

Constantin Philippenko and Aymeric Dieuleveut, Artemis: tight convergence guarantees for bidirectional compression in federated learning, 2020, *Under review at JPDC.*

TALKS

Ph.D. defense, 18th september 2023.

Bidirectional compression for federated learning in a heterogeneous setting.
Jury: Mikael Johansson (President and Reviewer), Jérome Malick (Reviewer), Manon Costa, Robert Gower, Martin Jaggi, Kevin Scaman.

Invited talks.

21st EUROPT Conference on Advances in Continuous Optimization, Lund University (Sweden), June 2024

54èmes Journées de Statistique, organizers: Société Française de Statistique, Bruxelles (Belgique), July 2023

Reading group of the DYOGENE Inria's team, organizers: Kevin Scaman and Laurent Massoulié, Inria, Paris (France), December 2022

Learning and Optimization in Luminy, organizers: Alexandre d'Aspremont et al., CIRM, Marseille (France), October 2022

StatMathAppli, organizers: Christophe Giraud and Estelle Kuhn, Villa Clythia in Fréjus, France, August 2022

Math for Machine Learning Summer School, organizer: Eric Moulines et al., Emines-UM6P, Benguerrir (Morocco), July 2022

Advances in Neural Information Processing Systems, Online Talk, December 2021

Recent advances in machine learning and uncertainty, organizers: Josselin Garnier et al., CIRM, Marseille (France), June 2021

52èmes Journées de Statistique, organizers: Société Française de Statistique, Nice (France), June 2021

SIMPAS Team at CMAP, organizers: Emmanuel Gobet and Erwan Le Pennec, Paris (France), November 2020

Tutorials on federated learning.

Hi!Paris Reading group, organizers: Yohan Petetin, Hi!Paris, Paris (France), April and June 2023

AirLiquide R&D, Paris Innovation Campus, January 2024

Ma thèse en 180 secondes (equivalent to 3MT), organized by *Institut Polytechnique de Paris*, 2024.

AWARDS

Accesit given by the jury of the "2022 STIC Doctoral Prizes", Fall 2022.
Organisers: Labex DigiCosme, école doctorale STIC de l'Université Paris Saclay, école doctorale de l'Institut Polytechnique de Paris.