

# CONSTANTIN PHILIPPENKO, PH.D.



Postdoctoral researcher at Inria Paris and DI ENS

Ph.D. in Applied Mathematics from École polytechnique

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Paris, France

github.com/philipco

## 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 unsupervised learning.
- Collaboration with **CEA Saclay** and the Cédric Gouy-Pailler's team.

Machine learning Deep learning LLM/NLP Python  
Pytorch HuggingFace Scikit-learn

### 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 Générale**, 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

## TEACHING EXPERIENCES

### Lecturer at École polytechnique, Paris 2020-2024

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

### Lecturer at Eminec, 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

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- ✍️ **Constantin Philippenko, Kevin Scaman and Laurent Massoulié**, In-depth analysis of low-rank matrix factorisation in a federated setting, 2025, *Proceedings of the AAAI Conference on Artificial Intelligence 2025*
- ✍️ **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, *arXiv*.

## TALKS

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Ph.D. defense, 18th september 2023.

Bidirectional compression for federated learning in a heterogeneous setting.

Jury: Mikael Johansson (President and Reviewer), Jérôme Malick (Reviewer), Manon Costa, Robert Gower, Martin Jaggi, Kevin Scaman.

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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.**, Mines-UM6P, Benguerri (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

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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

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

## AWARDS

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🏆 **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.