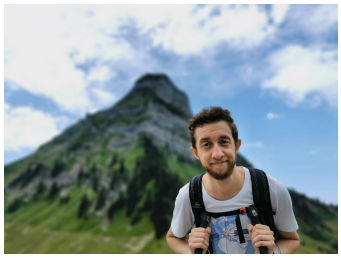
LeonardoPetrini

PhD Student, Physics and Machine Learning @ EPFL



about

Currently in Lausanne, CH

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github/leonardopetrini
slides.com/leopetrini
twitter.com/leopetrini_

languages

italian native
english full proficiency
french fluent

programming

Python advanced (6yrs)
PyTorch advanced (4yrs)
Julia beginner (1yr)

soft skills

curiosity
team work
communication

interests

food
deep learning
(personal) finance
mountains
photography

higher education

2019 - 2023 **PhD Student @ Physics of Complex Systems Lab** EPFL, Lausanne CH
Deep Learning Theory

summer '18 **CERN Summer Student Program - ATLAS Experiment** CERN, Meyrin CH
Project: Classification and Regression Studies for Flavour Tagging

2017 - 2019 **Master in Physics @ EPFL (GPA: 5.7/6)** EPFL, Lausanne CH
Minor in Computational Science and Engineering
Master Thesis: *Replicated Affinity Propagation Algorithm*.
Supervisor: Prof. Riccardo Zecchina, Artificial Intelligence Lab–Bocconi University

2016 - 2017 **ETH Exchange program** ETHZ, Zurich CH
Visiting student

2014 - 2017 **Bachelor cum laude (110L/110)** Politecnico di Torino, Turin IT
Physical Engineering and Young Talents Program (Progetto Giovani Talenti)

publications

2022 **How deep convolutional neural networks lose spatial information with training**
Preprint
U.M. Tomasini, **L. Petrini**, F. Cagnetta, M. Wyart (arXiv link)

2022 **Learning sparse features can lead to overfitting in neural networks**
Paper @ NeurIPS 2022
L. Petrini, F. Cagnetta, E. Vanden-Eijnden, M. Wyart (OpenReview link)

2021 **Relative stability toward diffeomorphisms indicates performance in deep nets**
Paper @ NeurIPS 2021
L. Petrini, A. Favero, M. Geiger, M. Wyart (OpenReview link)

2020 **Landscape and training regimes in deep learning**
Paper @ *Physics Reports*
M. Geiger, **L. Petrini**, M. Wyart

2020 **Geometric compression of invariant manifolds in neural networks**
Paper @ *Journal of Statistical Mechanics: Theory and Experiment*
J. Paccolat, **L. Petrini**, M. Geiger, K. Tyloo, M. Wyart

teaching and reviewing

- Teaching assistant for Statistical Physics II and III, 2019 to 2022.
- Teacher and supervisor of semester and master projects, 2019 to 2022.
- Reviewer for the Journal of Machine Learning Research (JMLR), 2022.
- Reviewer for the Workshop on the Theory of Overparameterized Machine Learning (TOPML), 2022.

conferences and schools

August '22 **IAIFI PhD Summer School and Workshop [poster]**
Institute for Artificial Intelligence and Fundamental Interactions, Boston, US

June '22 **Machine Learning Summer School (MLSS^N) [poster]**
Kraków, PL

Apr. '22 **Workshop on the Theory of Overparameterized Machine Learning [talk]**
https://topml.rice.edu/

Sept. '21 **On Future Synergies for Stochastic and Learning Algorithms [poster]**
CIRM Marseille, FR

June '21 **Statistical Mechanics and Emergent Phenomena in Biology [poster]**
The Beg Rohu Summer School, FR

June '21 **Youth in High Dimensions Conference [poster]**
ICTP, Trieste, IT

March '21 **How neural nets compress invariant manifolds [talk]**
Americal Physical Society, March Meeting, US

August '20 **Statistical Physics and Machine Learning Workshop [talk]**
Ecole de Physique des Houches, FR