

Emanuele Francazi

THEORETICAL PHYSICIST

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Education

ÉCOLE POLYTECHNIQUE FÉDÉRALE DE LAUSANNE (EPFL)

Lausanne, Switzerland

PHD IN PHYSICS

2021 - present

Thesis title (tentative): Interplay between Landscape and Dynamics in Deep Neural Networks

Thesis supervisors: Florent Krzakala and Marco Baity-Jesi

SAPIENZA UNIVERSITY OF ROME

Rome, Italy

MASTER IN THEORETICAL PHYSICS

2018 - 2021

Course Description : My Master's Degree curriculum is strongly orientated towards Statistical Mechanics (S.M.) ; I have also attended some courses of Quantum Field Theory to better understand some native particle physics concepts used also in S.M. (for example the renormalization group)

Thesis title : Study of finite size effects and phase transitions on graphs with high heterogeneity on nodes' degrees

Thesis supervisor : Federico Ricci Tersenghi

Final Mark : 110/110 magna cum laude

SAPIENZA UNIVERSITY OF ROME

Rome, Italy

BACHELOR IN PHYSICS

2015 - 2018

Thesis title : Study of low temperature behaviour in Spin Glass system

Thesis supervisor : Giorgio Parisi

Final Mark : 110/110 magna cum laude

Publications

2022

- E. Francazi, M. Baity Jesi, A. Lucchi, **A Theoretical Analysis of the Learning Dynamics under Class Imbalance**
ICML 2023 [Conference paper] [arXiv:2207.00391]

2023

- E. Francazi, A. Lucchi, M. Baity Jesi, **Initial Guessing Bias: How Untrained Networks Favor Some Classes**
under review [arXiv:2306.00809]

Skills

Programming Experienced: Python, PyTorch (Python), C Intermediate: Bash script Familiar: Matlab, R, Julia

Languages Native: Italian Fluent: English Beginner: French, German

Talks & Presentations

University of Basel

Congressi Stefano Franscini,

Monte Verità

SPEAKER

2022

- Retreat organized by Department mathematics and computer science (Workshop)
(Organiser: H. Schuldt)

Sapienza University

Roma

SPEAKER

2022

- Group seminar organized by Prof. F. Ricci Tersenghi (Seminar)
(Organiser: F. Ricci Tersenghi)

École normale supérieure de Lyon

Porquerolles

POSTER

2023

- High Dimensional Statistics and Random Matrices (Conference)
(Organisers: G. Ben Arous, A. Guionnet, J. Ko, JC Mourrat)

Princeton University

Princeton

POSTER

2023

- Princeton Machine Learning Theory (Summer School)
(Organiser: B. Hanin)

International Conference on Machine Learning

Hawaii Convention Center

POSTER

2023

- ICML 2023 (Conference)
(Organiser: A. Krause)

University of Basel

Congressi Stefano Franscini,
Monte Verità

SPEAKER

2023

- Novel Trends in Data Science 2023 (Workshop)
(Organiser: H. Schuldt)

Sapienza University

Roma

SPEAKER

2023

- Group seminar organized by Prof. F. Ricci Tersenghi (Seminar)
(Organiser: F. Ricci Tersenghi)

European Research Council

Leuven

SPEAKER

2024

- DeepK - International Workshop on Deep Learning and Kernel Machines (Workshop)
(Organiser: J. Suykens)

CECAM

EPFL,
Lausanne

SPEAKER

2024

- From Machine-Learning Theory to Driven Complex Systems and back (Workshop)
(Organiser: E. Agoritsas, A. Decelle, V. Ros, B. Seoane)

Other Courses

Stanford University

remotely

STUDENT

2017

- Machine Learning course based on Matlab Language
(Instructor: A. Yan-Tak Ng)

Eawag

Zurich

STUDENT

2021

- Environmental Systems Analysis (Summer school)
(Instructors: C. Albert, P. Reichert, A. Scheidegger, M. Baity Jesi)

EPFL

remotely

STUDENT

2022

- Loss Landscape of Neural Networks: theoretical insights and practical implications (Symposium)
(Organisers: W. Gerstner, C. Hongler)

ICTP

Trieste

STUDENT

2022

- Random Matrices, Random Graphs and Statistical Physics for Machine Learning and Inference (Summer school)
(Instructors: C. Male, L. Massoulié, M. Lelarge, M. Potters, P. Vivo)

Princeton University

Princeton

STUDENT

2023

- Machine Learning Theory (Summer School)
(Instructors: C. Pehlevan, P. Rigollet, J. Pennington, B. Adlam, A. Jacot, F. Mignacco)

Teaching Activity

Eawag

Zurich

TEACHING ASSISTANT

2022

- Environmental Systems Analysis (Summer school)
(Organiser: *C. Albert*)

Eawag

Lucerne

TEACHING ASSISTANT

2023

- Environmental Systems Analysis (Summer school)
(Organiser: *C. Albert*)

Positions of Responsibility

Eawag (ETH)

Zurich

MEMBER OF PHD COMMITTEE (COORDINATOR)

2023- present