

FRANCESCO CAPORALI

MASTER'S STUDENT IN MATHEMATICS

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📍 Via Roma 48, Oriolo Romano (VT), Italy
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EDUCATION

Master's degree (M.Sc.) in Stochastics and Data Science

University of Turin

📅 September 2022 – Ongoing

📍 Turin, Italy

- Master's degree in Mathematics with emphasis on probability, statistics and data analysis
- Program entirely taught in English

Allievi Honors Program, track in Economics, Statistics and Applied Mathematics

Collegio Carlo Alberto

📅 September 2022 – Ongoing

📍 Turin, Italy

- Merit-based admission with **full scholarship**
- Extra exams
- Mandatory **GPA** of at least **27/30**

Laurea Triennale (B.Sc.) in Mathematics

University of Pisa

📅 September 2018 – May 2022

📍 Pisa, Italy

- Final grade: **110/110 cum laude** (a.y. 2020/21)
- Computational curriculum
- Core classes:

📖 Probability

📖 Scientific Computing

📖 Numerical methods for ODEs

📖 Algorithms and Data Structures

📖 Operational Research

📖 Computational Laboratory

Liceo Scientifico (scienze applicate)

Liceo Scientifico Paolo Ruffini

📅 September 2013 – July 2018

📍 Viterbo, Italy

- Final grade: **100/100**

BACHELOR'S THESIS

🔗 Reti neurali profonde: capacità di approssimazione e convergenza a processi gaussiani

Deep neural networks: approximation capabilities and gaussian behaviour

Supervisor: Prof. Dario Trevisan

Description: Reviewing some relevant theoretical results, we analysed neural networks (NNs) as a formal model. We presented some versions of the density result of the functions that can be generated by NNs in L^p spaces and in $C(X)$ with X compact in \mathbb{R}^k . Then we studied the Gaussian asymptotic behaviour of random NNs. The work includes experiments developed independently using Python's PyTorch module.

PROJECTS

Undergraduate works

University of Pisa

📅 2018 – 2021

- 🔗 **Scientific Computing:** a *preconditioned conjugate gradient algorithm* for GeneRank (Matlab).
- 🔗 **Algorithms and Data Structures:** implementation of an *urban route planner* (C++).
- 🔗 **Computational Laboratory:** implementation and analysis of *simulated annealing* (Python).

SKILLS

Programming Languages

Proficient:

- Python (PyTorch)
- Matlab
- C, C++
- R

Basic:

- PHP
- JavaScript
- OCaml
- Julia

Markup Languages

Proficient:

- LaTeX

Basic:

- HTML

Other computer skills

- Microsoft Office
- Operating systems: Linux (all major distributions), Windows, macOS

Languages

- **Italian:** mother tongue
- **English:** B2 level

CERTIFICATIONS

First Certificate in English (FCE)

Cambridge English

📅 October 2017

- Grade: **178/190**

ACADEMIC INTERESTS

- Probability theory
- Functional analysis
- Machine learning
- Neural Networks
- Data Structures
- Programming

EXTRACURRICULARS

Winter school on Stochastic Processes, Analysis and Semigroups

Universities of Trento and Wuppertal

📅 December 12-16 2022 📍 Trento, Italy

- Four minicourses:
 - 📖 An introduction to Malliavin Calculus
 - 📖 Entropy inequalities and Wasserstein metric
 - 📖 Filtering theory
 - 📖 Regularisation by noise

PHC Systems administrator

Department of Mathematics, University of Pisa

📅 December 2018 – May 2022 📍 Pisa, Italy

- Member of a group of technicians that maintains a network of Linux computers and offers various services for mathematics students
- Maintenance of the web server poisson.phc.dm.unipi.it

OTHER INTERESTS

- Computers
- Running
- Board games and video games