

FRANCESCO CAPORALI

📅 Last updated: July 30, 2024

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EDUCATION

Ph.D. in Operations Research and Financial Engineering Princeton (NJ), USA
Princeton University August 2024 – Ongoing

M.Sc. in Stochastics and Data Science (Mathematics) Turin, Italy
University of Turin September 2022 – July 2024

- Final grade: 110/110 cum laude and special mention.
- **Thesis:** Student- t processes as infinite-width limits of posterior Bayesian Neural Networks
Supervisors: Prof. Stefano Favaro and Prof. Dario Trevisan

M.Sc. in Statistics and Applied Mathematics Turin, Italy
Collegio Carlo Alberto September 2022 – July 2024

B.Sc. in Mathematics (computational curriculum) Pisa, Italy
University of Pisa September 2018 – May 2022

- Final grade: 110/110 cum laude.
- **Thesis:** 🌀 Deep Neural Networks: approximation capabilities and Gaussian behaviour
Supervisor: Prof. Dario Trevisan

HONORS AND AWARDS

Allievi Honors Program Turin, Italy
Collegio Carlo Alberto September 2022 – Ongoing

- Competitive admission to a study program in applied mathematics and statistics. The Allievi are admitted after a nationwide selection.

EXTRACURRICULARS

School “Topics in Modern Machine Learning” Genoa, Italy
University of Genoa June 2023

School “Stochastic Processes, Analysis and Semigroups” Trento, Italy
Universities of Trento and Wuppertal December 2022

ACADEMIC INTERESTS

My academic studies have focused on the intersection of mathematical theory and practical applications, particularly in the field of machine learning. My main areas of interest and expertise include *probability theory, functional analysis, optimization, statistical machine learning, theoretical analysis of neural networks, and programming.*

UNIVERSITY PROJECTS

Master’s projects Turin, Italy
University of Turin and Collegio Carlo Alberto 2022 – 2023

- 🌀 *Machine Learning:* Review of theoretical results and implementation of Generative Adversarial Nets (GANs) for image generation (Python).
- 🌀 *Statistical Machine Learning:* Research and training of an optimal machine learning model to describe the data of a multinational retail company (Python).
- 🌀 *Algorithms:* Design and implementation of a text-based game on a graph with reinforcement learning integration (Python).
- 🌀 *Models and Algorithms:* Bayesian inference of a contact network of Potts variables (Python).

PROFESSIONAL EXPERIENCE

Tutorial teaching

University of Turin

Turin, Italy

March – June 2023

- Tutorial teacher of the *Probability and Statistics* course within the Bachelor's program in Mathematics for Finance and Insurance.

PHC System administrator

University of Pisa

Pisa, Italy

December 2018 – May 2022

- 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`.

SKILLS

Languages

- *Italian*: native.
- *English*: advanced level.

Programming languages

- Python (PyTorch, Pyro, pandas, scikit-learn, ...) | R | Matlab | C\C++ | SQL (basic) | Julia (basic)

Markup languages

- \LaTeX | HTML (basic)

Other computer skills

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