

GIANLUCA COVINI

PhD Student in Statistics and Computer Science
Bocconi University

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👤 [gianlucacovini](#)

📍 Milan, Italy

EDUCATION

PhD in Statistics and Computer Science

Bocconi University

📅 Sep 2025 – Jan 2030

📍 Milan, Italy

- **Advisor:** Prof. Hugo Lavenant.
- Research topics: entropic optimal transport and variational methods.
- Selected coursework: Measure Theory and Optimal Transport; Probability and Stochastic Processes; Statistical Theory. GPA: A.

MSc in Mathematics

University of Pavia

📅 Sep 2022 – Feb 2025

📍 Pavia, Italy

110/110 cum laude; GPA: 29.5/30

- Selected coursework: Functional Analysis; Advanced Probability; Stochastic Processes; Machine Learning.
- Additional coursework: Advanced Functional Analysis; Evolution Equations; Calculus of Variations.
- Thesis: *Dynamic Parameter Policies for LeadingOnes on Enhanced State Spaces*.
- Supervisors: Prof. Carola Doerr and Prof. Stefano Guagliardi.

Student, Merit-Based Programme

Almo Collegio Borromeo

📅 Sep 2022 – Jul 2024

📍 Pavia, Italy

- Advanced courses in optimal transport and stochastic differential equations.
- Co-organized a mathematics seminar series and a machine-learning course.
- Reading groups on Hausdorff measure, fractals, and Laplacian eigenvalues.

BSc in Mathematics

University of Pavia

📅 Oct 2019 – Sep 2022

📍 Pavia, Italy

110/110 cum laude; GPA: 29.8/30

- Selected coursework: Probability; Mathematical Statistics; Numerical Analysis; Optimization; Data Analysis.
- Thesis: *Ewens Sampling Formula and its Applications to the Study of Population Biodiversity*.
- Supervisor: Prof. Emanuele Dolera.

RESEARCH

Research Interests

I am interested in **optimal transport**, especially in the use of tools from *calculus of variations*, *gradient flows* and *differential geometry* to study problems arising in statistics, optimization, and machine learning.

Current Projects

Sinkhorn Propagation on Graphs

with Hugo Lavenant, Bocconi University

📅 Ongoing

We study **variational propagation problems on graphs** involving Sinkhorn divergences, using *variational methods*, *gradient-flow formulations*, and numerical algorithms.

Bayes Rule via Entropic Approximation of the Knothe–Rosenblatt Rearrangement

with Carlo Ciliberto and Giulia Luise

📅 Ongoing

We study **entropic approximations of the Knothe–Rosenblatt rearrangement** for *posterior sampling in Bayesian inference*.

Publication

G. Covini, D. Antipov, and C. Doerr. *Enhancing Parameter Control Policies with State Information*. Proceedings of FOGA 2025. arXiv:2507.08368.

Research Software

SlicedWasserstein.jl — registered Julia package for computing sliced Wasserstein distances. Author and maintainer.

Selected Talks

Conference Presentation

ROADEF 2025

📅 Feb 2025

📍 Champs-sur-Marne, France

Presented MSc thesis research on **dynamic parameter policies** for randomized local search on the *LeadingOnes* problem; abstract published in the conference book of abstracts.

Seminar Talk

WIAS Berlin

📅 Jan 2025

📍 Online

Presented Lambert et al., *Variational Inference via Wasserstein Gradient Flows*, in the seminar series “Modern Methods in Applied Stochastics and Nonparametric Statistics.”

UNDERGRADUATE RESEARCH

Survey on Distributionally Robust Optimization

Remote collaboration

📅 Oct 2024 – Dec 2024

📍 Remote

- Surveyed **submodular methods** for *distributionally robust optimization*.
- Supervisors: Prof. Angelos Georghiou and Prof. Rosario Paradiso.
- Survey report.

Statistics Summer Research Intern

Statistical Laboratory, University of Cambridge

📅 Jul 2024 – Aug 2024

📍 Cambridge, UK

- Studied **statistical properties of stochastic optimization problems** arising in *causal statistics*.
- Supervisors: Prof. Qingyuan Zhao and Tobias Freidling.
- Research report.

Research Intern in Operations Research

LIP6 – Sorbonne Université/CNRS

📅 Mar 2024 – Sep 2024

📍 Paris, France

- Developed **optimal parameter-control policies** for genetic algorithms in *dynamic algorithm configuration*.
- Supervisor: Prof. Carola Doerr.
- Outcomes: MSc thesis and FOGA 2025 paper.

Machine Learning Researcher

Sphaera

📅 Aug 2023 – Mar 2024

📍 Hybrid

- Developed a **computer-vision player-tracking algorithm** for five-a-side football.
- Supervisors: Dr. Mirko Messori and Dr. Giuseppe Roberto Marseglia.
- Research report; implementation proprietary.

TEACHING

Academic Tutor

University of Pavia

📅 Oct 2021 – Sep 2025

📍 Pavia, Italy

Teaching assistant for **Calculus** in Engineering and **Probability** in the Artificial Intelligence and Mathematics bachelor's programmes.

Lecturer, Advanced Computational Statistics

Almo Collegio Borromeo

📅 Oct 2023 – Dec 2023

📍 Pavia, Italy

Designed and taught a course combining **statistical theory** with applications to real-world data in R.

SUMMER SCHOOLS

- 2026:** Causality and Graphical Models (Bocconi–StatML); Mathematical Foundations of Machine Learning (CIRM).
- 2025:** Analysis and Machine Learning (Festum Pi); Theoretical Foundations of Machine Learning (MaLGa); Computational Optimal Transport and Missing Values (Bocconi–StatML).
- 2024:** Advanced Stochastic Optimization (NTNU); Copenhagen PhD School of Stochastic Programming.

AWARDS AND FUNDING

- Full PhD Scholarship**, Bocconi University (2025).
- Fully funded research stay**, Corpus Christi College, University of Cambridge (2024).
- Erasmus+ Traineeship Grant**, Sorbonne Université/CNRS (2024).
- Merit-Based Scholarship**, Associazione Alunni Almo Collegio Borromeo (2024).
- Funded participation in selected international schools and workshops (2024–2026).

SKILLS

Programming and Scientific Computing

Python

Julia

R

MATLAB

NumPy

Pandas

PyTorch

OpenCV

Matplotlib

Pyomo

Gurobi

CPLEX

Git

LaTeX

Linux

Languages and Tests

- Italian: native.
- English: C1, TOEFL iBT 106/120.
- French: B1, DELF B1.
- GRE: Quantitative 168, Verbal 162.

OTHER ACTIVITIES

Member of the Scientific Committee

Associazione Alumni Taramelli

📅 2024 – 2026

Served on the **scientific committee** of a secondary-school outreach project.

IT Consultant; Head of IT

JECO Pavia

📅 May 2021 – Sep 2023

📍 Pavia, Italy

Worked on **digitalization projects for SMEs**; later managed the IT area and annual strategy.

Auditor and Data Analyst

JE Italy

📅 Oct 2022 – Oct 2023

Provided **data analysis** and *audit support* for junior enterprises.

Earlier volunteering and organizational activities include Sant'Egidio – Youth for Peace, Entrepreneurship Club Pavia, and The Most Maiorum.