

EDUCATION

Polytechnic University of Milan. Milan, Italy. Spring 2025 – ongoing.

PhD in Mathematical Models and Methods in Engineering.

GPA 30/30. Supervisor: Prof. F. Regazzoni.

- Research focus: *Geometric and Probabilistic Methods for Uncertainty Quantification in Machine Learning*.

Polytechnic University of Milan. Milan, Italy. Fall 2021 – Spring 2024.

Master of Science in Mathematical Engineering: Computational Science and Computational Learning.

GPA 29.2/30. Final grade: 110/110 cum Laude.

- Master's thesis: "A discontinuous Galerkin approach for the heterodimer model of prion dynamics", under the supervision of Prof.ssa P. Antonietti, head of the Math Dept.
- Relevant coursework: Stochastic Dynamical Models; Algorithms and Parallel Computing; Advanced Programming for Scientific Computing; Advanced PDEs; Real and Functional Analysis; Numerical Analysis for Partial Differential Equations; Graph Optimisation; Computational Fluid Dynamics.

Sorbonne University, Pierre et Marie Curie. Paris, France. Fall 2022 – Spring 2023.

Exchange program at the Departments of Mathematics and Computational Mechanics.

- Advanced numerical methods for continuum models; foundation of non-linear dynamics.

Polytechnic University of Milan. Milan, Italy. Fall 2018 – Fall 2021.

Bachelor of Science in Mathematical Engineering.

- Core training in Analysis, Probability, Statistics, Numerical Methods, and Optimisation.

RESEARCH ACTIVITY

- **High-performance numerical methods for PDEs.** Design of MPI-parallel solvers for reduced fluid–structure models and development of domain-decomposed DG schemes, with theoretical and computational validation.
- **Computational modelling in neuroscience (BraiNum project).** Mathematical modelling and construction of computational solvers for neurodegenerative processes arising from prion-like propagation.
- **Scientific computing and cardiac modelling (life^x project).** Contributions to a C++ high-performance FEM framework for large-scale physiological simulations: parallelisation strategies, solver optimisation, and benchmarking.
- **Publication.** P. F. Antonietti, M. Corti, G. Lorenzon. *A discontinuous Galerkin method for the three-dimensional heterodimer model with application to prion-like proteins' dynamics* ↗. In: Proceedings of the European Congress of Mathematics (2024).
- **Ongoing research.** Probabilistic methods for machine learning, uncertainty quantification, and stochastic dynamics; Analysis of high-dimensional energy landscapes in spin-glass-inspired models and applications to epistemic uncertainty.

LANGUAGES AND COMPETENCES

Languages Italian (native), English, French.

Mathematics Probability and stochastic processes; optimisation; variational inference; stochastic dynamics and Langevin-type methods; high-dimensional statistical modelling.

Programming C, C++/17/20 (MPI, OpenMP), Python (NumPy, JAX), MATLAB, R; Bash and Linux environments.

Machine Learning & UQ Deep learning, generative modelling (flow matching, SDE-based models), Bayesian inference, uncertainty quantification, spin-glass-inspired models.

High-Performance Computing Parallel solver design; performance optimisation; HPC clusters, Git (CI/CD), Docker.

SELECTED RECOGNITIONS

- Merit-based scholarships from INPS and Lombardy Region for academic excellence (2022, 2024, 2025).
- Polytechnic University of Milan scholarship for high-merit students (2020, 2021, 2022).
- National Excellence Honour Roll (MIUR) and Medal for academic distinction (2019).
- *Alfieri del Lavoro* nominee, Presidential acknowledgement for outstanding high-school achievements (2017).

RELEVANT EXPERIENCES

JPMorgan Chase & Co. Quantitative Research - Focused on quantitative methods to estimate default probability.

Gallarate Basketball team Playmaker, Captain - Leadership and coordination responsibilities.

Model United Nations School leader - UN simulation in the Economic and Financial Committee with structured debate.

PoliMi Sailing Team - Performance Department: turbulence modelling on hydrofoils.

VOLUNTEERING AND INTERESTS

Volunteering Educational help to children with learning difficulties at ASA. Gallarate, Italy. 2014 – 2020.
Blood donor at AVIS. Gallarate, Italy. 2017 – present.

Interests Piano, Saxophone, Philosophy, Basketball, Tennis, Skiing, Alpinism, Climbing, Mathlete.