Piersilvio De Bartolomeis

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Education

Dec 2022 – present **Computer Science Ph.D.**, *ETH Zürich*.
- Advised by Prof. Fanny Yang and part of the Statistical Machine Learning group.
- Research interests: causal inference, uncertainty quantification, robustness, fairness.

Sep 2020– Oct 2022 **Data Science M.Sc.**, *ETH Zürich*, GPA 5.75/6.0.
- *Master Thesis*: "Certified defences based on convex relaxations hurt generalisation"
- *Selected courses*: Causality, Statistical Learning Theory, Mathematical Statistics, Reinforcement Learning, Advanced Machine Learning, Computational Biomedicine.

Aug 2019– Jan 2020 **Exchange Program**, *Hong Kong University of Science and Technology*, GPA 3.8/4.3.
- *Semester Project*: Contributed to the development of an indoor localization system which is currently deployed on the university campus, under the supervision of Prof. Gary Chan.

Sep 2017– July 2020 **Engineering of Computing Systems B.Sc. cum laude**, *Politecnico di Milano*, GPA 110/110.
- *Bachelor Thesis*: "Santorini: a multiplayer board game developed in Java".
  - Code available here.
- *Selected courses*: Probability and Statistics, Mathematical Analysis I and II, Linear Algebra, Algorithms and Principles of Theoretical Computer Science, Software Engineering.

Research experience

Sep 2021– June 2022 **Research Assistant**, *ETH Zürich*.
- Advised by Prof. Cara Magnabosco and part of the Geobiology group.
- Application of machine learning methods for the identification of protein secretion systems in bacterial genomes.

Teaching experience

Spring 2021 and 2022 **Machine Learning for Geobiology**, *ETH Zürich*.
- Designed homework assignments and held office hours with the students.
- Designed a Kaggle competition as part of the final course project.

Fall 2020 **Advanced Machine Learning**, *ETH Zürich*.
- Co-authored lecture notes for the course.
  - Available here.

Conference and workshop publications

Mirco Mutti, Riccardo De Santi, **Piersilvio De Bartolomeis**, and Marcello Restelli. Challenging common assumptions in convex reinforcement learning. *Advances in Neural Information Processing Systems (NeurIPS)*, 2022.

Piersilvio De Bartolomeis, Jacob Clarysse, Fanny Yang, and Amartya Sanyal. Certified defences hurt generalisation. *Contributed Talk @ Understanding Deep Learning Through Empirical Falsification Workshop*, NeurIPS 2022.

Piersilvio De Bartolomeis, Antonio Orvieto, and Giambattista Parascandolo. Enhancing unit-tests for invariance discovery. *Spurious Correlations, Invariance, and Stability Workshop*, ICML 2022.

Academic Projects

2021 **Statistical Learning Theory**.
- Implemented algorithms based on research papers in the areas of Markov Chain Monte Carlo Sampling, Deterministic Annealing, Constant Shift Embedding, and Mean Field Theory.
  - Code available here.

2020 **Single-nucleotide-variant interpretation**.
- Designed an efficient feature engineering pipeline for single nucleotide-variant data.
  - Code available here.

2020 **DNA sequence alignment**.
- Designed a memory efficient variant of suffix array and k-mer for indexing.
- Implemented banded global alignment to compare matches with a reference sequence.
  - Code available here.

Honors & Awards

2020 **Oracle GraphML Contest**, *Politecnico di Milano*.
- 1st place in the Graph Machine Learning contest organised by Oracle Labs (Zürich).

2019-2020 **Merit scholarship**, *Politecnico di Milano*.

2018 **Best freshmen scholarship**, *Politecnico di Milano*.