

Enea Monzio Compagnoni

PhD Student in Computer Science and Mathematics, Zurich, Switzerland

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I am a very motivated PhD Student in Deep Learning and Optimization. I am currently focusing on Differential Privacy for LLMs when high degrees of privacy are needed. I mathematically proved the advantages of common optimizers such as DP-Adam and designed new ones to test. Other than that, I am welcome any opportunity to expand my knowledge and gain hands-on experience with LLMs.

If you are looking for a highly productive and motivated individual, consider me:

1. I do not give up when Math gets hard;
2. I see things differently than other people.

You do not want to miss out on my **unorthodox creativity!**

Skills

Programming Languages and Tools: **Python**, **R**, **SQL**, Sklearn, JAX, TensorFlow, PyTorch, CUDA

Deep Learning: Stochastic Optimization, Transformers, LLMs, Diffusion Models, Differential Privacy

Mathematics: Stochastic Calculus, Probability, Linear Algebra, **Statistics**

Experience

Universität Basel

Oct 2022 – Present

PhD Student and Lecturer in Computer Science and Mathematics

- Conduct research on enhancing **differential privacy** for **LLMs** on GPT-2 architectures, contributing to secure and private AI advancements.
- Characterize the dynamics of optimization algorithms (SAM, AdamW, SignSGD, DCSGD) via **SDEs**.
- Mentor and teach students in **Deep Learning Foundations** and **Optimization** courses, enhancing their comprehension of advanced concepts.
- Expected graduation: October 2025.

Yahoo! Research

Jul 2023 – Sep 2023

Intern, Scalable Machine Learning Team

- Developed a **risk-aware model** for optimal control of **advertisement budgeting**, increasing spending control performance by **4%**, as validated through A/B testing.
- Applied **regression analysis** and **time-series analysis** to forecast ad spending and optimize budget allocations.
- Collaborated with cross-functional teams to integrate solutions into existing advertising platforms, enhancing system performance in a **fast-paced environment**.
- Utilized Python to analyze large datasets and implement machine learning models.

UBS AG

Jul 2019 – Sep 2022

AI Quantitative Analyst

- Designed a Lombard lending model for ultra-high-net-worth clients, enhancing decision-making processes through **predictive analytics**.
- Improved **liquidity forecasting** accuracy by **3%** for the Japanese market using regression analysis and time-series forecasting techniques.
- Enhanced anti-money laundering detection with **classification and clustering algorithms** (e.g., Adaboost, t-SNE), uncovering new fraud patterns and improving compliance.
- Conducted **experimental design** and statistical analysis to validate model performance, providing actionable insights to stakeholders.
- Collaborated with stakeholders in **complex financial environments** to implement AI solutions aligned with business goals.
- Utilized **Python, R, and SQL** for data extraction, analysis, and model development.

Education

ETH Zurich

Sep 2018 – Apr 2022

Master in Quantitative Finance (GPA: 5.76/6, Summa Cum Laude)

University of Milan

Oct 2015 – May 2018

Master in Mathematics (Grade: 110/110, Summa Cum Laude)

University of Milan

Sep 2012 – Oct 2015

Bachelor in Mathematics (Grade: 110/110, Summa Cum Laude)

Languages

English, Italian, German

Interests

- Cooking
- Fitness and Gym
- Magic: The Gathering
- Warhammer 40000
- Strategy Board Games