

## BIOGRAPHY

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My background is in Mathematics and Statistics, with applications to Machine Learning. My research focuses on [optimization](#) for Deep Learning. I am particularly interested in efficiency, distributed training, hyperparameter tuning and [benchmarking](#) optimization algorithms. I enjoy building and maintaining Machine Learning codebases!

## EXPERIENCE

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### Research Engineer - [Ellis Institute Tübingen](#), [Max Planck Institute for Intelligent Systems](#)

📍 Tübingen, DE

Jan. 2023 - Ongoing

- Research on sequence model architectures and optimization algorithms with Jonas Geiping and Antonio Orvieto.
- Developed submissions to AlgoPerf, a benchmark for optimization algorithms, scoring fourth in the competition [leaderboard](#).
- Joined MLCommons Algorithmic Efficiency team, developed open-source contributions to AlgoPerf [API](#).
- Mentored research interns in the CaCTüS program, researching LLM optimization and LLM watermarking.
- Released a simple PyTorch [codebase](#) for pretraining modern language models.

### AI Resident - [Meta](#), [FAIR Labs](#)

📍 Seattle, WA

July 2022 - Aug. 2023

- Research on hypergradient methods for adaptive hyperparameter tuning with Lin Xiao.
- Investigated loss spikes in language model optimization and the Slingshot phenomenon.
- Gained experience in ML optimization, distributed training, and familiarity with vision and language model training.

### ML Researcher - [U-Care Medical](#)

📍 Turin, IT

Dec. 2021 - June 2022

- Developed machine learning models to forecast Acute Kidney Injury in critically ill patients.
- Developed algorithms to discriminate persistent kidney injury and transient kidney injury in ICU patients.
- Conducted statistical analyses and designed data visualization APIs to support product promotion.

## EDUCATION

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### Politecnico di Milano - [Master of Science](#) in Mathematical Engineering & Statistical Learning

March 2019 - Oct. 2021

- Thesis: [Functional Time Series Forecasting](#).
- Advisor: Simone Vantini.
- Teaching assistant for "Algorithms and Parallel Computing", covering C++, OOP, data structures, parallel programming.

### Politecnico di Milano - [Bachelor of Science](#) in Mathematical Engineering

March 2019 - Oct. 2021

- Thesis: [Deep Learning Optimization Algorithms and Saddle Points](#).
- Advisor: Danilo Ardagna.

## SELECTED PUBLICATIONS

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[Ajroldi, N.](#), Orvieto, A., & Geiping, J. When, Where and Why to Average Weights? (2025). [ICML 2025](#). [ArXiv preprint](#).

Islamov, R., [Ajroldi, N.](#), Orvieto, A., & Lucchi, A. (2024). Loss landscape characterization of neural networks without over-parametrization. [NeurIPS 2024](#). [ArXiv preprint](#).

[Ajroldi, N.](#), Diquigiovanni, J., Fontana, M., & Vantini, S. (2023). Conformal prediction bands for two-dimensional functional time series. Computational Statistics & Data Analysis (CSDA), 187, 107821. [Article URL](#).

Alfieri, F., Ancona, A., Tripepi, G., Rubeis, A., [Ajroldi, N.](#), Finazzi, S., Cauda, V., & Fagugli, R. M. (2023). Continuous and early prediction of future moderate and severe acute kidney injury in critically ill patients. PLOS ONE, 18, 1–22. [Article URL](#).