Niccolò Ajroldi

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WORK EXPERIENCE

Meta AI **July 2022 - ongoing**
AI Resident in Fundamental AI Research (FAIR) Labs *Seattle, WA*

- Developed stochastic optimizers and implemented algorithms for adaptive tuning of hyperparameters.
- Investigated factors contributing to loss explosion in AI model training.
- Gained experience in **ML optimization**, **PyTorch**, slurm, wandb and training vision and language models.

U-Care Medical **Dec. 2021 - June 2022**
ML Researcher *Turin, IT*

- Developed models to forecast Acute Kidney Injury in critically ill patients.
- Implemented ML model to discriminate persistent kidney injury from transient kidney injury in ICU patients.
- Optimized **data processing** pipeline in Python, resulting in a 50% reduction in compute time.
- Responsible for statistical analysis and managment of large clynical datasets.
- Created an RShiny demo, enhancing **data visualization** and facilitating product promotion to healthcare institutions.

EDUCATION

Politecnico di Milano **March 2019 - Oct. 2021**
Master of Science in Mathematical Engineering & Statistical Learning *Milan, IT*

- Final grade: 110/110 (GPA: 4.0)
- Thesis: Functional Time Series Forecasting.
- Main courses: Algorithms and Parallel Computing, Applied Statistics, Bayesian Statistics, Machine Learning, Real and Functional Analysis, Stochastic Processes, Game Theory, Optimization.

Politecnico di Milano **Sept. 2015 - March 2019**
Bachelor of Science in Mathematical Engineering *Milan, IT*

- Thesis: Deep Learning Optimization Algorithms near Saddle Points.
- Main courses: Linear Algebra, Calculus I, II, III, Differential Equations, Numerical Analysis, Probability.

TEACHING

Politecnico di Milano **Sept. 2020 - Feb. 2021**
Teaching assistant for the course "Algorithms and Parallel Computing" *Milan, IT*

- Assisted students in laboratories on C++, OOP, parallel programming, MPI and data structures.

PUBLICATIONS & RESEARCH

Conformal Prediction Bands for Two-Dimensional Functional Time Series
Ajroldi, Diquigiovanni, Fontana, Vantini, (2023), accepted for publication by Computational Statistics & Data Analysis.
Development of algorithms to forecast time evolving surfaces and estimate prediction uncertainty. Proposal of estimation techniques for functional autoregressive models and implementation of distribution-free uncertainty quantification tools.
Article. GitHub.

Continuous and early prediction of Acute Kidney Injury in critically ill patients
Alfieri, Ancona, Tripepi, Rubeis, Arjoldi, Finazzi, Cauda, Fagugli, (2023), on PLOS ONE.
This study introduces a novel ML model to continuosly predict, Acute Kidney Injury episodes in Intensive Care Units using routinely-available data. The model is tested through a multi-centric, multi-national external validation procedure.
Article.

Bayesian Nonparametric Clustering of Functional Data
Implementation of a functional clustering algorithm leveraging a Dirichlet Process mixture model to identify nervous system damage in comatose patients, by clustering central nervous system response to electrical stimuli.
Technical report. GitHub.