Lorenzo Mobilia

Data Scientist — Machine Learning Engineer — Physicist
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Professional Summary

Machine learning engineer & data scientist with a background in physics and strong experience in AI model developing for complex signals and big data. Strong proficiency in Python, C++, TensorFlow, and distributed computing environments with applications in detection, forecasting and predictive analysis. Collaborative contributor to international projects with experience in presenting at major scientific conferences. Interests in bringing AI solutions in renewable energy sector, healthcare and technology innovation.

Technical Skills

- **Programming:** Python, C++, Bash, html
- **Machine Learning:** TensorFlow, `scikit-learn`
- **Data Analysis** & **tools** NumPy, Pandas, Matplotlib, PyCBC, MBTA
- **Tools:** HTCondor, Linux, Git, LaTeX, HPC
- **Languages:** Italian (native), English (professional), French (intermediate), Spanish (Intermediate)

Professional Experience

Data Scientist / Machine Learning Researcher. *Università degli Studi di Urbino + INFN Firenze* 2022 – Present

- Developed machine learning algorithms (Random Forest and CNN) to classify and detect gravitational wave signals in real-time datasets.
- Designed and maintained scalable data analysis pipelines (MBTA group) using Python, C++, TensorFlow.
- Collaborated within the LIGO-Virgo-KAGRA consortium applying AI to large-scale scientific data.
- Delivered presentations at GWPAW (Birmingham, 2024), LVK (Baton Rouge, 2024), EuCAIF (Cagliari, 2025) and Amaldi-GR24 (Glasgow, 2025) on machine learning applications.

Visiting PhD Researcher

IJCLab, Université Paris-Saclay, Orsay, France Oct 2024 – Jan 2025

- Conducted research on the application of Convolutional Neural Networks (CNNs) to gravitational wave data analysis.

Research Assistant (AirLab Project). *Università di Padova + INFN Padova* 2021 – 2022

- Led development of low-cost environmental sensors using RaspberryPi and custom hardware.
- Delivered educational workshops to high school students on data acquisition and analysis.

- Promoted STEM education and environmental awareness through hands-on hardware development.

Tutor (Physics & Mathematics). *Università degli Studi di Urbino & Padova* 2019 – 2024

- Provided tutoring in physics and mathematics to undergraduate and high school students.
- Designed and delivered problem-solving workshops to improve student performance.

Education

PhD in Science and Technology Research Methods
Università degli Studi di Urbino + INFN Firenze 2022 – Present

Master's Degree in Physics, 110/110
Università degli Studi di Padova 2019 – 2022
Thesis: *Gravitational Wave Detection Using Coherent Wave Burst Algorithm*

Bachelor's Degree in Physics, 108/110
Università degli Studi di Perugia 2015 – 2019

Selected Publications

- *"The MBTA Pipeline for Detecting Compact Binary Coalescences in the Fourth LIGO-Virgo-KAGRA Observing Run,"* CQG, arXiv:2501.04598
- *"Machine learning techniques for gravitational waves data analysis,"* Il Nuovo Cimento, 10.1393/ncc/i2025-25099-8
- *"Search for continuous gravitational waves from known pulsars in the first part of the fourth LIGO-Virgo-KAGRA observing run,"* arXiv:2501.01495

Additional Information

website: https://ml150914.github.io/ml150914-infos/