Davide Moretti

RESEARCH FELLOW AT IAC-CNR

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Personal Profile

A research fellow who recently graduated from Roma Tre University with a Master's in Computational Sciences (curriculum of Data Science and Statistics). I am dedicated to machine learning and data analysis.

Education

Roma Tre University — *Rome, Italy*

PhD in Mathematics — *Dec 2024 - current*

- Currently starting a PhD without a scholarship.

Roma Tre University — *Rome, Italy*

MSc in Computational Sciences — *Oct 2021 - Jan 2024*

- Graduated with a score of $110/110$ cum Laude.
- Experimental thesis: *"About clustering of time series:A case study with traffic data by Autostrade Alto Adriatico S.p.A.".*
- **Supervisor:** Prof. Vincenzo Bonifaci, **Co-supervisor:** Dr. Elia Onofri.
- **Courses:** Parallel Computing, Machine Learning, Statistics, Complex Networks, Markov Processes, Stochastic Calculus, Computability and Complexity, Numerical Analysis, Information Theory.

Roma Tre University — *Rome, Italy*

Bachelor's Degree in Mathematics — *Oct 2018 - Oct 2021*

- Graduated with a score of $110/110$ cum Laude.
- Applied Mathematics curriculum.
- **Courses:** Numerical Analysis, Advanced Probability, Combinatorial Optimization, Algorithms and Data Structure, Statistics, Calculus, Analysis, Number Theory, Topology, and Linear Algebra.

Liceo Scientifico Statale Giuseppe Peano — *Rome, Italy*

Scientific High School Diploma — *Sep 2013 - Jun 2018*

- Applied Sciences Curriculum. Studied Pascal and Python.
- Final Grade: $100/100$.

Work Experience

Italian National Research Council (Istituto per le Applicazioni del Calcolo "Mauro Picone") — *Rome, Italy*

Research Fellowship — *Mar 2024 - current*

- **Research project:** ERA4TB European Regimen Accelerator For Tuberculosis.
- Worked on analysis of experimental data and development and calibration of simulation models.

Roma Tre University — *Rome, Italy*

IT Tutor — *Oct 2023 - Feb 2024*

- Won the student-collaboration scholarships announcement for a position as a tutor for the course "IN110 - Algorithms and data structures".
- **Instructor:** Prof. Marco Liverani, **Teaching Assistant:** Dott. Elia Onofri.

Italian National Research Council (Istituto per le Applicazioni del Calcolo "Mauro Picone") — *Rome, Italy*

Curricular Internship — *Apr 2023 - Jun 2023*

- A 175 hours curricular internship at the Italian National Research Council(CNR)
- **Topics:** Verification, analysis, and detection of anomalies on real vehicle traffic data, using clustering and and anomaly detection techniques.
- **Supervisors:** Dott. Elia Onofri, Dott. Emiliano Cristiani

Conferences

YAMC - Young Applied Mathematicians Conference (4th Edition) *Rome, Italy*
Speaker (short presentation) *Sep 2024*
- Short Presentation (20') about clustering of time series and the results obtained in my Master's thesis. ("*About clustering of time series: A case study using real traffic data*")
- Official Site: www.yamc.it/home
- Book of Abstracts: www.yamc.it/special-issue-and-boa

Academic Projects

Automated Recognition of Artificially Generated Images
Rome, Italy
Roma Tre University - Machine learning course end project (IN550) *Sep 2023*
- Recognizing artificially generated images in a custom dataset built using Stable Diffusion v2.
- Creation and training of neural networks and decision trees, pre-processing the images both via convolution filters and feature extraction.
- **Technical Skills**: Python (Jupyter Notebook, tensorflow, keras, sklearn), PowerPoint.
- **Soft Skill**: Presentation skills, Independent work.

Project on Reinforcement Learning
Rome, Italy
Roma Tre University - "Algebra lineare per il Machine Learning" course end project (GE530) *Jul 2023*
- Introduction to Agent-Environment schemes, Markov Decision Processes, and Model-Based/Model-Free approaches, with the implementation of simple examples.
- **Technical Skills**: MATLAB, LaTeX, LaTeX Beamer.
- **Soft Skill**: Presentation skills, Source material research.

Project on Attribute Based Encryption
Rome, Italy
Roma Tre University - "Crittografia a chiave pubblica" course end project (CR410) *Feb 2023*
- Group project on the introduction to Ciphertext Policy Attribute-Based Encryption on lattices.
- Writing of a theoretical analysis of ABE schemes and implementation of lattice-based CP-ABE schemes.
- **Technical Skills**: C++ (PALISADE), LaTeX, LaTeX Beamer.
- **Soft Skill**: Report writing, Presentation skills, Time management, Teamwork, Source material research.

Prediction of the Final Medal Standings for the World Athletics Championships 2022
Rome, Italy
Roma Tre University - "Statistica 2, Statistica Matematica" course end project (ST420) *Feb 2023*
- Group project on predicting the Final Medal Standings and the 100-meter dash results using past events results, using statistical methods such as regression and Montecarlo simulation.
- **Technical Skills**: Excel, Wolfram Mathematica, PowerPoint.
- **Soft Skill**: Presentation skills, Teamwork.

Anomaly Detection Presentation
Rome, Italy
Roma Tre University - "Statistica 2, Statistica Matematica" course end project (ST420) *Jan 2023*
- Hold a seminar on Anomaly Detection, illustrating different approaches and applications.
- Focus on Classification, Nearest Neighbour, Clustering, and Statistical based techniques.
- **Soft Skill**: Presentation skills, Independent Work.

Skills

Programming   Python, C, PgSQL, Wolfram Mathematica, Matlab.
Miscellaneous   LaTeX(Overleaf/MikTex), Microsoft Office, Git.

Merits

2023	**Winner,** Merit scholarship for students enrolled in the Master's degree program in Computational Science.	*Rome*
2022	**Winner,** Merit scholarship for students enrolled in the Master's degree program in Computational Science.	*Rome*
2018	**Winner,** Merit scholarship for newly enrolled students in the Bachelor's degree program in Mathematics.	*Rome*

Languages

Italian   Native proficiency
English   C1 (Cambridge English Level 2 Certificate in ESOL International, Advanced). Obtained in June, 2018.