

Mario Correddu

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RESEARCH INTERESTS

I am primarily interested in data analysis and statistics, with a focus on machine learning, particularly in the context of network structured data.

EDUCATION

Università di Pisa, Pisa, Italy September 2021 — May 2024
Master degree in Mathematics.

Thesis Title: Markov switching quantile regression

Primary focus on modeling and applied mathematics, especially machine learning, data science, and finance.

Under the guidance of Professor Andrea Agazzi at the University of Pisa and in collaboration with Max Lampe, Economist at the European Central Bank, I completed my master's thesis titled Markov Switching Quantile Regression. This research focused on applying a multifrequency Markov switching quantile regression model to forecast growth-at-risk in the Eurozone.

Università di Pisa, Pisa, Italy September 2017 — May 2021
Bachelor of Science: Mathematics

Bachelor's degree in mathematics with a computational focus.

Under the supervision of Professor Dario Trevisan at the University of Pisa, I successfully completed my bachelor's thesis titled 'The Random Euclidean Minimum Spanning Tree'.

Istituto tecnico Angelo Roth, Alghero(SS), Italy June 2017
Secondary school diploma in tourism

PROFESSIONAL EXPERIENCE

European Central Bank, Frankfurt am Main, Germany July 2024 — ongoing
Trainee in the Division of Systemic Risk and Financial Institutions in the Directorate General Macroeconomic Policy and Financial Stability. My main tasks involve support for data management and visualization, and innovation, with a focus on incorporating AI both to help business life and analytical work.

ACADEMIC EXPERIENCE

Università di Pisa, Pisa, Italy April 2024 — July 2024
Tutoring activity for the Data Analysis course

PUBLICATIONS

- Correddu, M. and Trevisan, D. (2024) 'On minimum spanning trees for random Euclidean bipartite graphs', *Combinatorics, Probability and Computing*, 33(3), pp. 319–350. doi:10.1017/S0963548323000445.

SELECTED COURSES

Master's Courses

- Istituzioni di Probabilità (advanced course in stochastic processes)
- Discrete and continuous models in probability (course erogated by Scuola Normale Superiore)
- Financial Mathematics (financial derivatives models, term structure of interest rates models, and risk measures)
- Quantitative Finance (course erogated by Scuola Normale Superiore, advanced course covering financial derivatives models and econometrics for volatility)
- Data Analysis (course in statistical learning)
- Introduction to Machine Learning
- Deep learning theory (course on abstract theory of deep learning)
- Intelligent Systems for Pattern Recognition (advanced course with topics in generative models, deep learning and reinforcement learning)
- Theory and Methods of Optimization

Bachelor's Courses

- Probability
- Algorithms and Data Structures
- Operations Research
- Programming Languages with laboratory

OTHER EXPERIENCES

- **participant of the Summer school in Generative & eXplainable pis-AI** at University of Pisa 16/09/24 - 18/09/24
- **organizer of the cycle of seminars MAD - The Mathematics of Data** at University of Pisa for the events of 28/05/2024 and 04/06/2024
- **visiting student at ScaDS.Ai** (Center for Scalable Data Analytics and Artificial Intelligence), Leipzig, from 9/10/2023 to 13/10/2023

SKILLS

- **Programming:**
 - Proficient in Python, Matlab, R, C, and C++, SQL and management of projects using Git. Developed expertise through coursework projects and during my experience at ECB.
 - Further developed experience with machine learning and statistical tools, particularly during my final project for the "introduction to machine learning" course where I developed a Graph Neural Network model for the drug-drug interaction problem and during my Master's thesis;
 - experience with large dataset manipulation matured during my experience at ECB, particularly when working on bank interconnection where data consisted in multiple linkage in-between banks and firms
 - experience with the use of LLM both in the context of building applications and for the use of data extraction
 - Fast learner when it comes to picking up new programming languages. Adapts well to different coding challenges and enjoys exploring new tech tools for research.
- **Soft skills:**
 - I excel at tackling problems with an analytical and hands-on approach, applying practical solutions to real-world challenges;
 - developed strong communication skills through coursework presentations on research papers and projects and through presentations provided during my traineeship;
 - thrives in collaborative environments and enjoys working towards common goals with a team.
- **Languages:** Italian (native), English (C1, certified through FCE in 2016), French(B2), Russian (B1)