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 financial applications.

EDUCATION

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

 Thesis Title: Markov switching quantile regression

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

 Under the guidance of Professor Andre 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 at the Systemic Risk and Financial Institutions Division in the Directorate General Macroprudential Policy and Financial Stability

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 continous 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

- **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++. Developed expertise through coursework projects;
  - 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;
  - 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;
  - 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)