

*Curriculum Vitae*

**Federico Gatta**

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**Education** 

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**PhD Student** — Computational Methods and Mathematical Models for Sciences and Finance

*November 2022* Scuola Normale Superiore, Pisa, Italy

*Ongoing*

**Supervisors:** Prof. Piero Mazzarisi, Prof. Fabrizio Lillo

**Topic:** Risk Management and Machine Learning methods for Finance;  
analysis of Decentralized Exchanges properties and comparison  
with Traditional Finance.

**Subject:** Econometrics; Computer Science.

**Master's degree** — Mathematics (LM40), with honors

*December 2018* University of Naples Federico II, Italy

*February 2021*

**Thesis:** Machine Learning Approaches in Financial Data Analysis

**Advisors:** Prof. Salvatore Cuomo, Prof. Francesco Piccialli

**Subject:** Data Analysis

**Topic:** Discussion about financial time series and their properties; analysis  
of different predictive methods; introduction of a novel technique  
for stocks clustering oriented to the construction of a pure-alpha  
strategy, with applications in different markets.

**Bachelor** — Mathematics (L35), with honors

*September 2015* University of Naples Federico II, Italy

*December 2018*

**Thesis:** Strategy-proof social choice functions

**Advisors:** Chiar.mo Prof. Achille Basile, Prof. Anna De Simone

**Subject:** Game Theory

**Topic:** Discussion about the properties of social choice mechanisms for the  
aggregation of preferences.

**Working Experiences** 

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*April 2021 -*

*October 2022*

**Research Fellow**

Mathematical mODelling and Data AnaLysis (MODAL),

University of Naples Federico II, Italy

Research on Machine Learning and Deep Learning topics, especially focused  
on their applications in real-world contexts, such as Industry 4.0.

November 2017 -  
May 2018

### Part-time Student

University Library, University of Naples Federico II  
Relationship with students and use of Alma software for automated  
library management.

### Awards

March 2024

### Winner of the SIAG/FME Code Quest 2023

The competition, organized by the SIAM Activity Group on Financial Mathematics and Engineering and sponsored by World Business Chicago, combined two FinTech themes: Decentralized Finance and Automated Asset Management. Over 120 teams from around the world signed up for the competition.

June 2020

### Buon Compleanno Federico II

The award is given by the University of Naples Federico II in 2020 for the excellence of *cursus studiorum*.

### Research Activity

#### Research Papers

**Deviations from Tradition: Stylized Facts in the Era of DeFi,**  
Arxiv, (2025).

(with D.M. Di Nosse, F. Lillo, S. Jaimungal)

**A high-frequency approach to Realized Risk Measures,**  
Arxiv, (2025). [GitHub link](#)

(with F. Lillo, P. Mazzarisi)

**CAESar: Conditional Autoregressive Expected Shortfall,**  
Arxiv, (2024). [GitHub link](#)

(with F. Lillo, P. Mazzarisi)

**A Multi-step Approach for Minimizing Risk in Decentralized Exchanges,** Arxiv, (2024). [GitHub link](#)

(with D.M. Di Nosse)

**ENCODE-Ensemble neural combination for optimal dimensionality encoding in time-series forecasting,** Information Fusion, (2023).

(with F. Giampaolo, E. Prezioso, S. Cuomo, M. Zhou,  
G. Fortino, F. Piccialli)

**Meshless methods for American option pricing through Physics -Informed Neural Networks**, Engineering Analysis with Boundary Elements, (2023).

(with V. Schiano Di Cola, F. Giampaolo, F. Piccialli, S. Cuomo)

**Statistical Arbitrage in the Stock Markets by the means of Multiple Time Horizons Clustering**, Neural Computing and Applications, (2023). [GitHub link](#)

(with C. Iorio, D. Chiaro, F. Giampaolo, S. Cuomo)

**Neural networks generative models for time series**, Journal of King Saud University-Computer and Information Sciences, (2022).

(with F. Giampaolo, E. Prezioso, G. Mei, S. Cuomo, F. Piccialli)

**Predictive maintenance for offshore oil wells by means of deep learning features extraction**, Expert Systems, (2022); e13128.

(with F. Giampaolo, D. Chiaro, F. Piccialli)

**An Unsupervised Learning Framework for Market Neutral Portfolio**, Expert Systems with Applications, (2022); 116308. [GitHub link](#)  
(with S. Cuomo, F. Giampaolo, C. Iorio, F. Piccialli)

### **Teaching**

**Python lab on artificial neural networks with applications to option pricing**, Summer School in Machine Learning methods for Finance, July 14-19, 2024

### **Talks**

**Deviations from Tradition: Stylized Facts in the Era of DeFi**,

▷ Workshop on Decentralized Finance and Market Microstructure,

May 10-11, 2025

▷ International Fintech Research Conference, January 30-31, 2025

**A high-frequency approach to Realized Risk Measures**,

▷ AMASES XLIX Conference, September 11-13, 2025

▷ XXVI Workshop on Quantitative Finance, April 15-17, 2025 (QFW2025)

**CAESar: Conditional Autoregressive Expected Shortfall**,

▷ Artificial Intelligence in Finance, ECAI workshop, October 26, 2025

▷ AMASES XLVII Conference, September 5-7, 2024

▷ XXV Workshop on Quantitative Finance, April 11-13, 2024 (QFW2024)

**Unsupervised Learning of Option Price: a Neural Network Approach**, SDS Conference, April 27-28, 2023

**A Machine Learning Approach in Stock Risk Management**, CLADAG Conference, September 9-11, 2021

### **Organizer**

**Decentralized Finance & Crypto Workshop @ Scuola Normale Superiore**, January 26-28, 2025

## International Experiences

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November 2014

### PON C5

One-month training course in the locality of Nova Gorica (Slovenia). The internship project was characterized by numerous visits to the most advanced factories of the Slovenian productive infrastructures, such as Salonit Anhovo and BIA Separations.

## Memberships

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*Since November 2018 Mensa Italia*

High IQ society open to people who score at the 98th percentile on an intelligence test.

*Since April 2024*

### Society for Industrial and Applied Mathematics (SIAM)

World's largest scientific society devoted to applied mathematics. Member of the SIAM Activity Group (SIAG) of Financial Mathematics and Engineering and SIAG on Data Science.

*Since June 2024*

### Italian Association of Mathematics Applied to Economic and Social Sciences (AMASES)

## Digital Skills

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Information Processing	Communication	Content Creation	Safety	Problem Solving
Proficient User	Proficient User	Proficient User	Proficient User	Proficient User

According to Europass Digital Competences - self-assessment grid.

## Computer Skills

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<b>Python</b>	Good knowledge. I wrote various projects in Python and Jupyter, including all the experiments carried out for my research activity. You can find some of them on my <a href="#">GitHub repo</a> . Specifically, I often used scientific libraries such as Numpy, Pandas, Statsmodels, Sklearn, Scipy, PyTorch, TensorFlow, and Cython. Moreover, I worked with Selenium on web scraping.
<b>MATLAB</b>	Discrete knowledge, I learned MATLAB at university and I further enhanced my skills with the various courses on the MATLAB training center website, in particular Machine and Deep Learning.
<b>Rust</b>	Basic knowledge, I'm learning this language to improve my DeFi expertise.
<b>C</b>	Basic knowledge, I used this language for two exams.
<b>MQL4</b>	Basic knowledge, I did some experiments with trading expert systems based on the technical analysis of the forex market.
<b>Excel</b>	Good knowledge, I used this tool for handling real-world data in my research.
<b>R</b>	Basic knowledge, I used this language for simulating stochastic processes as an exam task.
<b>L<sup>A</sup>T<sub>E</sub>X</b>	Good knowledge, I wrote various works with L <sup>A</sup> T <sub>E</sub> X, e.g. both my thesis and, of course, this CV.
<b>Microsoft Office</b>	Basic knowledge, I used these tools on many occasions for various small jobs.
<b>Mathematica</b>	Basic knowledge, I'm working with this tool to improve projects for courses.
<b>Inkscape</b>	Basic knowledge, I used this software to realize illustrations for my papers.
<b>GIMP</b>	Basic knowledge, I used this software to realize small pictures for my thesis.

## Language Skills

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<b>Italian</b>	Native Language
<b>English</b>	First Certificate in English (B2 First) - Exam Date: 2021-12-11

Listening	Reading	Speaking	Spoken Interaction	Writing
C1	C1	C1	C1	C1

According to the CEFR self-assessment grid.

## My Word Cloud

