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# Andrea Amato

## PHD STUDENT IN MATHEMATICS

**Profile**

Andrea Amato is a Ph.D. student in Mathematics at the University of Bologna. His studies are focused on different areas of probability theory, from stochastic calculus and finance to numerical probability and machine learning.
He received his Master's degree in Mathematics with distinction at the University of Bologna in 2023. After this, he won a Ph.D. scholarship, within the PNRR European project 'Mathematical methods and models for human resource planning, public safety and environmental protection'. In this project, he is studying a problem of optimization of a photovoltaic panels system in a joint project with the Department of Electrical, Electronic, and Information Engineering 'Guglielmo Marconi' at the University of Bologna.
In his research, Andrea and other authors are developing a numerical approximation of McKean-Vlasov stochastic differential equations using the stochastic gradient descent method. Also, Andrea is analyzing a portfolio optimization problem in the form of a singular stochastic optimal control problem motivated by optimal goal-based investment.

**Education**

2023–Now **Alma Mater Studiorum University of Bologna**
**PHD in Mathematics**

2020–2023 **Alma Mater Studiorum University of Bologna**
**Master's Degree in Mathematics**
Thesis: *Numerical Resolution of McKean-Vlasov Stochastic Differential Equations by Stochastic Gradient Descent Method*
Advisor: Stefano Pagliarani

2017–2020 **Alma Mater Studiorum University of Bologna**
**Bachelor's Degree in Mathematics**
Thesis: *Stochastic Gradient Descent Method*
Advisors: Andrea Pascucci and Stefano Pagliarani

2012–2017 **Niccolò Copernico Scientific High School**
**High School Diploma**
Option: Applied Sciences

**Tutoring Experience**

2025 **Alma Mater Studiorum University of Bologna**
Course: INTRODUCTION TO MACHINE LEARNING [cod. 95662]
Professors: Stefano Pagliarani and Giovanni Paolini

2024 **Alma Mater Studiorum University of Bologna**
Course: PROBABILISTIC METHODS FOR MACHINE LEARNING [cod. 96791]
Professors: Stefano Pagliarani and Giovanni Paolini

2023 **Alma Mater Studiorum University of Bologna**
Course: CALCOLO DELLE PROBABILITA' E STATISTICA [cod. 04642]
Professors: Elena Bandini and Stefano Pagliarani

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**Publications**

2023 **Journal paper in review**
*Numerical approximation of McKean-Vlasov SDEs via stochastic gradient descent*
(Agarwal Ankush, Amato Andrea, Pagliarani Stefano, dos Reis Gonçalo)

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**Attended Events**

2025 **Conference**
*Mathematics of uncertain systems for economics and finance (Hotel Sporting, Rimini, 26-30 May 2025)*
Contributed talk: *Numerical approximation of McKean-Vlasov SDEs via stochastic gradient descent*

**Winter School**
*Dolomites Winter School - Optimal Transport: from robust pricing to model calibration (Folgarida and Madonna di Campiglio, 26-31 January 2025)*
Poster presenter

2024 **PhD Conference**
*ASK Conference 2024: Interaction between different areas of Mathematical Analysis and Probability (Bologna, 18 -20 December 2024)*
Organizer

**Workshop**
*Workshop on Stochastic Processes, Stochastic Optimal Control, and their Application (Politecnico di Milano, Department of Mathematics, 26 - 27 September 2024)*
Participant

**Conference**
*4th Italian Meeting on Probability and Mathematical Statistics (University building of San Pietro in Vincoli, Rome, 10 - 14 June 2024)*
Participant

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| **Experience** | 2022 | **Universidad Complutense de Madrid** (Madrid, Spain)<br>Erasmus+ |
| | 2021 | **Multitraccia S.C.** (Reggio Emilia, Italy)<br>internship |

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| **Languages** | Italian | Native |
| | English | Fluent |
| | Spanish | Intermediate |

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**Computer Skills**

Microsoft Office (Word, Excel, etc.)
Python (Numpy, Pandas, Sklearn, Pytorch, Jupyter Notebook, etc.)
MATLAB
LaTeX
Google Colab