
Andrea Amato

Profile

Andrea Amato is a Ph.D. student in Mathematics at the University of Bologna. He received his Master's degree in Mathematics with distinction from the University of Bologna in 2023. After this, he won a Ph.D. scholarship within the PNRR European project at the Department of Mathematics of the University of Bologna.

In his research, Andrea focuses on the study of several aspects of stochastic analysis, optimal control, machine learning, numerical approximations, and their applications to mathematical finance. Andrea is particularly interested in the study of numerical approximation of McKean-Vlasov stochastic differential equations using the stochastic gradient descent method; mean-field control problems with singular controls and associated mean-field games of singular controls; portfolio optimization problems formulated as singular stochastic optimal control problems, motivated by optimal goal-based investment; and the optimization of photovoltaic panel systems.

Education

2023–Now	PhD in Mathematics (University of Bologna)
2020–2023	Master's Degree in Mathematics (University of Bologna) Thesis: <i>Numerical Resolution of McKean-Vlasov SDEs by Stochastic Gradient Descent Method</i> Supervisor: Stefano Pagliarani
2017–2020	Bachelor's Degree in Mathematics (University of Bologna) Thesis: <i>Stochastic Gradient Descent Method</i> Supervisors: Andrea Pascucci and Stefano Pagliarani
2012–2017	High School Diploma — Applied Sciences (Niccolò Copernico Scientific High School)

Publications

2023	A. Agarwal, A. Amato, S. Pagliarani, G. dos Reis. <i>Numerical approximation of McKean-Vlasov SDEs via stochastic gradient descent</i> . arXiv preprint arXiv:2310.13579, (2023)
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Visiting

2025	Research visiting at the Center for Mathematical Economics (IMW), Bielefeld University (Bielefeld, Germany) Invited by Professor Giorgio Ferrari (September – December 2025)
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Tutoring Experience

2025	Course: <i>Introduction to Machine Learning</i> (University of Bologna) Professors: Stefano Pagliarani and Giovanni Paolini
2024	Course: <i>Probabilistic methods for Machine Learning</i> (University of Bologna) Professors: Stefano Pagliarani and Giovanni Paolini
2023	Course: <i>Calcolo delle probabilità e statistica</i> (University of Bologna) Professors: Elena Bandini and Stefano Pagliarani

Attended Events	2026	<i>Dolomites Winter School - Mean-field systems in finance, neurosciences and AI (Folgarida and Madonna di Campiglio, 11 - 16 January 2026)</i> Contributed talk: <i>Singular Mean-Field Control via Singular Mean-Field Games</i>
	2025	<i>Workshop on Irregular Stochastic Analysis (Palazzone di Cortona, Cortona, 23–27 June 2025)</i> Flash talk: <i>Numerical approximation of McKean–Vlasov SDEs via stochastic gradient descent</i>
		<i>Mathematics of uncertain systems for economics and finance (Hotel Sporting, Rimini, 26–30 May 2025)</i> Flash talk: <i>Numerical approximation of McKean–Vlasov SDEs via stochastic gradient descent</i>
		<i>Dolomites Winter School – Optimal Transport: from robust pricing to model calibration (Folgarida Madonna di Campiglio, 26–31 January 2025)</i> Poster presenter
2024	<i>ASK Conference 2024: Interaction between different areas of Mathematical Analysis and Probability (Bologna, 18–20 December 2024)</i> Organizer	
		<i>Workshop on Stochastic Processes, Stochastic Optimal Control, and their Application (Politecnico di Milano, 26–27 September 2024)</i> Participant
		<i>4th Italian Meeting on Probability and Mathematical Statistics (San Pietro in Vincoli, Rome, 10–14 June 2024)</i> Participant

Experience	2022	Erasmus+ at Universidad Complutense de Madrid (Madrid, Spain)
	2021	Internship at Multitraccia S.C. (Reggio Emilia, Italy)

Languages	Italian	Native
	English	Fluent
	Spanish	Intermediate

Computer Skills	Microsoft Office (Word, Excel, etc.)
	Python (NumPy, Pandas, Scikit-learn, PyTorch, Google Colab, etc.)
	MATLAB
	L ^A T _E X

Links	GitHub
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