

Kristoffer ANDERSSON

Postdoctoral Researcher, University of Verona

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RESEARCH EXPERIENCE

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| 2024- | <p>Postdoctoral researcher at University of Verona</p> <p>I develop advanced deep learning models for solving Backward Stochastic Differential Equations (BSDEs) with non-standard features such as jumps, path dependency, and measure dependency. The primary objective is to apply these enhanced BSDE models to real-world challenges in mathematical finance and risk management, enabling their use in addressing industry-relevant problems.</p> |
| 2024 | <p>Postdoctoral researcher at Utrecht University</p> <p>In this project I explored convergence properties of the deep BSDE method applied to coupled FBSDEs. In particular, I investigated when and why the method fails to converge. Furthermore, I developed a novel method that overcomes these convergence issues.</p> |
| 2019-2023 | <p>PhD candidate at Centrum Wiskunde & Informatica and TU Delft/Utrecht University</p> <p><i>Thesis: Neural networks for stochastic control and decision making in mathematical finance</i></p> <p>This PhD project was directed towards the usage of modern machine learning algorithms to approximate problems from stochastic control, often with applications in mathematical finance. More specifically, I have developed an algorithm to solve strongly coupled FBSDEs stemming from stochastic optimal control problems and provided a corresponding error analysis. On the more applied side I worked on valuation adjustments (xVAs) of large portfolios of high-dimensional exotic options in the presence of a defaultable counterpart. Moreover, I developed an algorithm for time-inconsistent portfolio optimization problems.</p> |

TEACHING/SUPERVISING EXPERIENCE

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| 2025- | <p>Supervisor of PhD student <i>Junior Parfait Ngalamo</i> (co-supervised with <i>Alessandro Gnoatto</i>) at University of Verona</p> |
| 2024 | <p>Gave a guest lecture on stochastic control in the master course: <i>Stochastic Calculus</i> at Chalmers University of Technology</p> |
| 2024 | <p>Served as a lecturer and assignment supervisor in the course: <i>Seminar Series on Machine Learning in Finance</i> at Utrecht University - <i>Machine learning in finance</i> at Utrecht University</p> |
| 2020-2025 | <p>Co-supervised master theses in collaboration with Prof. Cornelis W. Oosterlee (1-3) and PhD. Per Ljung (4)</p> <ul style="list-style-type: none">4. Bekir Fazlija & Benjamin Jonsson - <i>Deep coupled BSDE methods for fictitious games</i>, Chalmers University of Technology and Saab AB Radar Solutions, 20253. Nicky Zaugg - <i>Stochastic Calculus for Fractional Brownian Motion</i>, Utrecht University, 20222. Iris Kojiman - <i>Signature-based model recognition in financial time series</i>, TU Delft, 20211. Bálint Négyesi - <i>A Novel Method for Solving High-Dimensional Backward Stochastic Differential Equations Using Malliavin Calculus and Deep Learning</i>, TU Delft, 2020 |

2022	Served as a lecturer in the course: <i>Seminar Series on Machine Learning in Finance at Utrecht University - Machine learning in finance at Utrecht University</i>
2017	Teaching assistant in various mathematics courses at Chalmers University of Technology and University of Gothenburg

SELECTED INDUSTRY AND APPLIED RESEARCH COLLABORATIONS

- **Saab** (2025-) – Ongoing collaboration on Stochastic Differential Games with applications in drone defense systems.
- **MN Asset Management / TU Delft** (2021) – Built and back-tested optimal-execution model with Prof. C. W. Oosterlee; cut simulated slippage and analyzed liquidity in different trading venues.
- **Syntronic** (2018–2019) – Bench-marked CNN and RL pipelines for autonomous-driving radar data.

AWARDS

2022	Received the Best Youngster Presenter award at 4th International Conference on Computational Finance (ICCF) , Wuppertal, Germany, June 2022.
2023	SIAM High Impact Article Recognition, 2023 - Paper: <i>Convergence of a robust deep FBSDE method for stochastic control</i> . published in SIAM Journal on Scientific Computing.

ACADEMIC SERVICE

Referee for journals including: *SIAM Journal on Scientific Computing*, *Journal of Machine Learning Research*, *Annals of Applied Probability*, *Automatica*, *Applied Mathematics and Computation*, *Applied Numerical Mathematics*, *Annals of Operations Research*, *IMA Journal of Numerical Analysis*.

EDUCATION

2015–2017	Master of Science in ENGINEERING MATHEMATICS, Chalmers University of Technology , Gothenburg Grade average: 4.67/5.0 Thesis: <i>Approximate stochastic control based on deep learning and FBSDEs</i>
2012–2015	Undergraduate Degree in ENGINEERING MATHEMATICS, Chalmers University of Technology , Gothenburg Grade average: 3.92/5.0 Thesis: <i>Simulations of Cox–Ingersoll–Ross processes</i>

LANGUAGES

SWEDISH: Mothertongue
ENGLISH: Fluent

PROGRAMMING AND TECHNICAL SKILLS

Primary: Python (scientific computing, stochastic simulation, deep learning)
ML Frameworks: TensorFlow, Keras
Scientific Computing: MATLAB, R
Additional: FEniCS, Java, C

LIST OF PUBLICATIONS

10. Kristoffer Andersson, Adam Andersson, and Per Ljung. *Convergence of fictitious play for fully coupled FBSDEs in finite-player stochastic differential games* arXiv preprint arXiv:2607.08861

9. Kristoffer Andersson, Alessandro Gnoatto, and Camilo A. G. Trillos. *A deep solver for backward stochastic Volterra integral equations*. SIAM Journal on Scientific Computing. 48 (2), (2026). 359-384.
8. Kristoffer Andersson, Adam Andersson, and Cornelis W. Oosterlee. *The deep multi-FBSDE method: a robust deep learning method for coupled FBSDEs*. Springer Journal of Scientific Computing (2026).
7. Kristoffer Andersson, and Alessandro Gnoatto. *Multi-Layer Deep xVA: Structural Credit Models, Measure Changes and Convergence Analysis*. arXiv preprint arXiv:2502.14766 (2025).
6. Kristoffer Andersson, Alessandro Gnoatto, Marco Patacca, and Athena Picarelli. *A deep solver for BSDEs with jumps*. SIAM Journal on Financial Mathematics 16 (3), 875-911 (2025).
5. Kristoffer Andersson, and Cornelis W. Oosterlee. *On deep portfolio optimization with stocks, bonds and options*. Journal of Computational Finance (2025).
4. Kristoffer Andersson, Adam Andersson, and Cornelis W. Oosterlee. *Convergence of a robust deep FBSDE method for stochastic control*. SIAM Journal on Scientific Computing 45.1 (2023): A226-A255. Recognized as a SIAM High Impact Article.*
3. Balint Nagy, Kristoffer Andersson, and Cornelis W. Oosterlee. *The One Step Malliavin scheme: new discretization of BSDEs implemented with deep learning regressions*. arXiv preprint arXiv:2110.05421 (2021). To appear in: IMA Journal of Numerical Analysis Oxford University Press
2. Kristoffer Andersson, and Cornelis W. Oosterlee. *Deep learning for CVA computations of large portfolios of financial derivatives*. Applied Mathematics and Computation 409 (2021): 126399.
1. Kristoffer Andersson and Cornelis W. Oosterlee. *A deep learning approach for computations of exposure profiles for high-dimensional Bermudan options*. Applied Mathematics and Computation 408 (2021): 126332.

LIST OF PRESENTATIONS

12. **Vienna Seminar on Finance and Probability**, Vienna, Austria, January 2026.
11. **Research seminar on Stochastic Analysis and Financial Markets**, Berlin, Germany, December 2025.
10. **Berlin Probability Colloquium**, Berlin, Germany, December 2025.
9. **12th General AMAmEF Conference**¹, Verona, Italy, June 2025.
8. **22th Winter school on Mathematical Finance**, Amersfoort, the Netherlands, January 2025.
7. **4th International Conference on Computational Finance (ICCF)**, Amsterdam, Netherlands, April 2024.
6. **Utrecht AI Labs Event** (poster), Utrecht, the Netherlands, May 2023.
5. **Dutch Math Finance afternoons**, Delft, the Netherlands, March 2023.
4. **4th International Conference on Computational Finance (ICCF)**, Wuppertal, Germany, June 2022.
3. **SAAB Technical Forum - Radar systems**, Gothenburg, Sweden, March 2022.
2. **Workshop on Machine Learning in Quantitative Finance and Risk Management**², Amsterdam, the Netherlands, July 2020.
1. **9th International Congress on Industrial and Applied Mathematics (ICIAM)**, Valencia, Spain, July 2019.

¹Part of the local organizing team

²Organized by Cornelis W. Oosterlee and Kristoffer Andersson