

Florian Ofenheimer-Krach

Curriculum Vitae



PERSONAL DETAILS

Birth November 5, 1994, in Graz, Austria
Address ETH HG G46, D-MATH, Rämistrasse 101, 8092 Zürich, Switzerland
Homepage <https://floriankrach.github.io>
GitHub <https://github.com/FlorianKrach>
LinkedIn <https://www.linkedin.com/in/floriankrach/>
Mail florian.krach@math.ethz.ch

WORK EXPERIENCE

Postdoctoral Researcher 03/2025 - present
ETH Zürich, FinsureTech Hub
Research in machine learning and teaching for the CAS ETH in Machine Learning in Finance and Insurance.
Co-supervision of theses of students.

Scientific and Teaching Assistant as Doctoral Student 09/2019 - 02/2025
ETH Zürich
Academic research and teaching.

Quantitative Research & Machine Learning 04/2019 - 03/2020
Araneum Technologies & Z22 Technologies
Research and implementation of fully automatic trading algorithms using Python. (Full time until end of 06/2019, then as sideline.)

Community Service 10/2013 - 06/2014
Lebenshilfe Graz und Umgebung
Tasks in the front and back office as well as work with people with disabilities.

EDUCATION

PhD in Mathematics 09/2019 - 02/2025
ETH Zürich
In my PhD with Prof. Josef Teichmann, I focused on the intersection of machine learning and finance, as well as exploring fundamental research questions in machine learning through a mathematical lens.

MSc. Mathematics (Degree application in 06/2019) 09/2017 - 03/2019
ETH Zürich
Specialization on stochastic finance, mathematical optimization and computational statistics (machine learning). Seminar project on model calibration with neural networks. Master thesis about generative adversarial networks (GANs). Graduation with distinction (overall GPA: 6.0/6.0) and awarded the Willi Studer Prize 2020.

BSc. Mathematics (Degree application in 02/2018) 09/2014 - 08/2017
ETH Zürich

First year joint program of mathematics and physics. Second year compulsory mathematical courses. Third year specialization on probability theory, statistics, functional analysis, discrete mathematical finance and stochastic calculus. Bachelor thesis about optimal investment. (Overall GPA: 5.62/6.0).

Academic High School

09/2005 - 07/2013

BRG Kepler, Graz, Austria

Eight year general education with focus on mathematics and natural sciences. Competed in several mathematical competitions. Class representative for eight years, second school representative for one year. Graduation with distinction (overall GPA: 1.0/1.0).

PUBLICATIONS & PREPRINTS

Mathematics

- Jakob Heiss, Florian Krach, Thorsten Schmidt and Félix B. Tambe-Ndonfack. Nonparametric Filtering, Estimation and Classification using Neural Jump ODEs. 2024. arXiv preprint.
- Florian Krach and Josef Teichmann. Learning Chaotic Systems and Long-Term Predictions with Neural Jump ODEs. 2024. arXiv preprint.
- Raeid Saqur, Anastasis Kratsios, Florian Krach, Yannick Limmer, Jacob-Junqi Tian, John Willes, Blanka Horvath and Frank Rudzicz. Filtered not Mixed: Stochastic Filtering-Based Online Gating for Mixture of Large Language Models. 2024. International Conference on Learning Representations (ICLR) (2025).
- Florian Krach, Josef Teichmann and Hanna Wutte. Robust Utility Optimization via a GAN Approach. 2024. arXiv preprint.
- Florian Krach, Andrea Macrina, Ashley Kanter, Eba Hampwaye, Siphokazi Hlalukana and Nchakha Ratelee. The Financial Impact of Carbon Emissions on Power Utilities Under Climate Scenarios. 2023. International Journal of Theoretical and Applied Finance (IJTAF) (2024).
- Xuwei Yang, Anastasis Kratsios, Florian Krach, Matheus Grasselli and Aurelien Lucchi. Regret-Optimal Federated Transfer Learning for Kernel Regression with Applications in American Option Pricing. 2023. arXiv preprint.
- William Andersson, Jakob Heiss, Florian Krach and Josef Teichmann. Extending Path-Dependent NJ-ODEs to Noisy Observations and a Dependent Observation Framework. 2023. Transactions on Machine Learning Research (TMLR) (2024).
- Florian Krach, Marc Nübel and Josef Teichmann. Optimal Estimation of Generic Dynamics by Path-Dependent Neural Jump ODEs. 2022. arXiv preprint.
- Calypso Herrera, Florian Krach, Pierre Ruysen and Josef Teichmann. Optimal Stopping via Randomized Neural Networks. 2021. Frontiers of Mathematical Finance (FMF).
- Calypso Herrera, Florian Krach and Josef Teichmann. Neural Jump Ordinary Differential Equations: Consistent Continuous-Time Prediction and Filtering. 2021. International Conference on Learning Representations (ICLR).
- Calypso Herrera, Florian Krach and Josef Teichmann. Estimating Full Lipschitz Constants of Deep Neural Networks. 2020. arXiv preprint.
- Calypso Herrera, Florian Krach, Anastasis Kratsios, Pierre Ruysen and Josef Teichmann. Denise: Deep Robust Principal Component Analysis for Positive Semidefinite Matrices. 2020. Transactions on Machine Learning Research (TMLR) (2023).

Theses

- Doctoral Thesis: Neural Jump Ordinary Differential Equations. Under the supervision of Josef Teichmann at ETH Zurich, defended February 2025.

- Master Thesis: A Study of Generative Adversarial Networks, under the supervision of Josef Teichmann at ETH Zurich, 2019. Available on GitHub.

Medical Research

- Alina Ofenheimer, Marie-Kathrin Breyer, Emiel F.M. Wouters, Caspar Schiffers, Sylvia Hartl, Otto C. Burghuber, Florian Krach, David M. Maninno, Frits M.E. Franssen, Tobias Mraz, Patricia Puchhammer, Robab Breyer-Kohansal. The effect of body compartments on lung function in childhood and adolescence. *Clinical Nutrition*. 2023.
- Ofenheimer, Alina and Breyer-Kohansal, Robab and Hartl, Sylvia and Burghuber, Otto C. and Krach, Florian and Franssen, Frits M. E. and Wouters, Emiel F. M. and Breyer, Marie-Kathrin. Using Body Composition Groups to Identify Children and Adolescents at Risk of Dyslipidemia. *Children*. 2021.
- Ofenheimer, A., Breyer-Kohansal, R., Hartl, S. et al. Reference values of body composition parameters and visceral adipose tissue (VAT) by DXA in adults aged 18–81 years—results from the LEAD cohort. *Eur J Clin Nutr*. 2020.
- Ofenheimer, A., Breyer-Kohansal R, Hartl S, Burghuber OC, Krach F, Schrott A, Franssen FME, Wouters EFM, Breyer MK. Reference charts for body composition parameters by dual-energy X-ray absorptiometry in European children and adolescents aged 6 to 18 years – Results from the Austrian LEAD (Lung, hEart , sociAl , boDy) cohort. *Pediatric Obesity*. 2020.

TALKS

Recordings of some of my talks can be found on my website.

- Oxford-ETH workshop, Oxford, June 2-4, 2025, Neural Jump ODEs as Generative Models.
- 9th Asian Quantitative Finance Conference (AQFC), Shenzhen, China, April 26-28, 2025, Neural Jump ODEs for Input-Output Systems.
- Rough Path Interest Group (RPIG) seminar, online, April 2, 2025, Invited Talk, Neural Jump ODEs.
- Freiburg-Padova-Wien-Zürich seminar, Davos/Klosters, February 26-28, 2025, Neural Jump ODEs for Input-Output Systems.
- Statistics Seminar of the Universitat Pompeu Fabra (UPF), Barcelona, February 6, 2025, Invited Talk, Neural Jump ODEs.
- Stochastics in Mathematical Finance and Physics Conference, Hammamet, Tunisia, October 21 - 25, 2024, Invited Talk, Neural Jump ODEs for Input-Output Systems.
- 31st IFIP TC7 Conference on System Modeling and Optimization, University of Hamburg, August 12-16, 2024, Invited Talk, Optimal Estimation of Generic Dynamics by Path-Dependent Neural Jump ODEs.
- 12th Bachelier World Congress of the Bachelier Finance Society, FGV, Rio de Janeiro, Brazil, July 8-12, 2024, Path-Dependent Neural Jump ODEs and their forecasting capabilities in LOBs.
- Imperial - Hong Kong - ETH Workshop, Imperial College London, June 17-21, 2024, Path-dependent Neural Jump ODEs and their Application in Finance.
- Oxford-ETH Workshop, ETH Zurich, April 2-4, 2024, Robust Utility Optimization via a GAN approach.
- Applied Machine Learning Days (AML D) 2024, EPFL, Lausanne, March 25, 2024, Invited Talk, Path-Dependent Neural Jump ODEs and their forecasting capabilities in LOBs.

- 16ème Colloque Bachelier en Mathématiques Financières et Calcul Stochastique, Métabief, France, January 15-19, 2024, Path-Dependent Neural Jump ODEs and their Application to Stochastic Filtering.
- 10th International Congress on Industrial and Applied Mathematics (ICIAM 2023 Tokyo), Waseda University, Tokyo, Japan, August 20-25, 2023, Invited Talk, Path-Dependent Neural Jump Ordinary Differential Equations.
- 7th International Conference on Mathematics in Finance 2023, Berg-en-Dal Rest Camp, Kruger National Park, South Africa, July 24-28, 2023, Contributed Talk, Robust Utility Optimization via a GAN Approach.
- Oxford-ETH Workshop on Mathematical Finance, University of Oxford, June 26-28, 2023, Regret-Optimal Federated Transfer-Learning.
- Freiburg-Wien-Zürich (FWZ) Seminar, Lindauer Hütte, Februar 27 - March 2, 2023, Contributed Talk, Robust Utility Optimization via a GAN Approach
- 2nd Edition of the School on Machine Learning of Dynamic Processes and Time Series Analysis, Scuola Normale Superiore Pisa, November 09-10, 2022, Contributed Talk, Path-Dependent Neural Jump Ordinary Differential Equations.
- Oxford-ETH Workshop on Mathematical Finance, ETH Zürich, June 20-21, 2022, (Extended) Neural Jump Ordinary Differential Equations.
- 11th World Congress of Bachelier Finance Society, virtually in Hong Kong, China, June 17, 2022, Contributed Talk, Optimal Stopping via Randomized Neural Networks.
- Rough Paths & SPDE Seminar, TU Berlin, June 9, 2022, Invited Talk, (Extended) Neural Jump Ordinary Differential Equations.
- Quantitative Finance Workshop 2022, Rome, April 1, 2022, Contributed Talk, Neural Jump Ordinary Differential Equations.
- AMaMeF Conference 2021, June 24, 2021, Contributed Talk, Neural Jump Ordinary Differential Equations.
- International Conference on Learning Representations (ICLR) 2021, May 3, 2021, Poster & Video Presentation, Neural Jump Ordinary Differential Equations: Consistent Continuous-Time Prediction and Filtering.

CO-ORGANISATION

- Minisymposium, Neural differential methods in Finance, 12th Bachelier World Congress of the Bachelier Finance Society, July 8 - 12, Rio de Janeiro, Brazil.

TEACHING EXPERIENCE

CAS ETH in Machine Learning in Finance and Insurance

03/2025 - present

ETH Zürich

Python Workshops for ML topics, challenges, and projects.

ADIA Lab International Summer School 2025 on "Explainable AI"

May 2025

University of Granada

Lecture on xAI together with Josef Teichmann and Bastian Bergmann, where I talked about "An Instance of Explainable AI: Explainability in the context of Neural Jump ODEs".

Mathematics for New Technologies in Finance

April 2024

ETH Zürich

In spring 2024 I held one week of Josef Teichmann's lecture on Machine Learning in Finance, where I covered the topics Deep Calibration and Generative Adversarial Networks (GANs).

Financial Mathematics Team Challenge (FMTC)

July 2023

University of Cape Town

I participated as team leader at the FMTC 2023. Team Members: Eba Hampwaye, Siphokazi Hlalukana, Nchakha Thato Rateele. Mentors: Ashley Kanter, Andrea Macrina. Project Title: South Africa's Carbon Opportunity.

Coordinator and/or Teaching Assistant

09/2018 - 02/2025

ETH Zürich

Diskrete Mathematik for D-ITET (HS 2018), Stochastik for D-MATL, D-MAVT, RW (HS 2019), Wahrscheinlichkeit und Statistik for D-MATH (FS 2020), Mathematik 3 for D-HEST (HS 2020), Mathematik 1&2 for D-HEST, D-BIOL, D-PHARM (HS 2021, FS 2022, HS 2023).

CO-SUPERVISION

- William Andersson, PD-NJ-ODE for Predictions in Convex Spaces, Master Thesis at ETH Zürich under Supervision of Josef Teichmann, 2024.
- Markus Chardonnet, Probabilistic Forecasting for Time Series Anomaly Detection, Master Thesis at ETH Zürich under Supervision of Josef Teichmann, 2023.
- William Andersson, Overcoming Independence between the Observed Process and the Observation Framework in PD-NJ-ODEs, Semester Project at ETH Zürich under Supervision of Josef Teichmann, 2023.
- Tengyingzi Ma, Limit Order Book Simulation with GANs, Semester Project at ETH Zürich under Supervision of Josef Teichmann, 2022.
- Marc Nübel, Neural ODE Models for Continuous Time Prediction of Non-Markovian Processes, Master Thesis at ETH Zürich under Supervision of Josef Teichmann, 2021.
- Group Project of Lecture Machine Learning in Finance, Neural Jump ODEs and their Application to Classification Tasks, ETH Zürich, 2021.
- Kei Ishikawa, Multilevel Quasi Monte Carlo Methods for Neural SDEs, Semester Project at ETH Zürich under Supervision of Markus Kalisch and Josef Teichmann, 2021.
- Jonas Baggenstos, Reinforcement Learning in Financial Markets using Lipschitz Extensions, Bachelor Thesis at ETH Zürich under Supervision of Josef Teichmann, 2020.

SKILLS & HOBBIES

<i>Software</i>	PYTHON (ML, deep learning, data science & stats, parallel programming, web-scraping, PyScript), C++, R (several machine learning techniques), MATLAB, SWIFT, GIT, L ^A T _E X, HTML & JS & SQL (basics) MS OFFICE
<i>Languages</i>	German (native language), English (fluent), Italian (fluent speaking), French (intermediate)
<i>Various Hobbies</i>	Swiss Skitouring Guide (esa Leiterkurs Skitouren) since January 2023 Skitouring (tour guide for TC Zollikon), Skiing, Hiking, Climbing, Golf, Tennis, Swimming, Cooking