NIKLAS DEXHEIMER

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Employment

University of Twente — since Sep. 2024
Postdoc at the Department of Applied Mathematics (DAMUT) — *Enschede, The Netherlands*

Aarhus University — Oct. 2022 – Sep. 2024
Postdoc at the Department of Mathematics — *Aarhus, Denmark*

Christian-Albrechts-Universität zu Kiel — Jul. 2022 – Sep. 2022
Postdoc at the Department of Mathematics — *Kiel, Germany*

Education

Aarhus University

Ph.D. in Mathematics — Jun. 2020 – Jun. 2022
Thesis: On statistical inference for selected multivariate stochastic processes of diffusion type
Advisor: Prof. Dr. Claudia Strauch — *Aarhus, Denmark*

University of Mannheim

Ph.D. Student — May 2019 – May 2020
Continued studies at Aarhus University

Master of Science in Mathematics in Business and Economics — Sep. 2016 – May 2019
Thesis: Lévy processes and stochastic differential equations, Grade: 1.1 with distinction

Bachelor of Science in Mathematics in Business and Economics — Sep. 2013 – July 2016
Thesis: Tricks with martingales, Grade: 1.4 — *Mannheim, Germany*

Focus Areas

Statistics for stochastic processes, statistical analysis of biologically plausible learning rules, nonparametric statistics, high-dimensional statistical inference, data-driven stochastic optimal control, machine learning

Publications

Peer-reviewed

Spike-timing-dependent Hebbian learning as noisy gradient descent (2025)
(with Sascha Gaudlitz and Johannes Schmidt-Hieber)
Accepted at *NeurIPS 2025*, arXiv: 2505.10272.

Adaptive nonparametric drift estimation for multivariate jump diffusions under sup-norm risk
Stochastic Processes and their Applications 190 (2025), 104741, DOI: 10.1016/j.spa.2025.104741

On Lasso and Slope drift estimators for Lévy-driven Ornstein–Uhlenbeck processes
(with Claudia Strauch)
Bernoulli 30 (2024), no.1, pp. 88–116. DOI: 10.3150/22-bej1574

Estimating the characteristics of stochastic damping Hamiltonian systems from continuous observations
(with Claudia Strauch)
Stochastic Processes and their Applications 153 (2022), pp. 321–362. DOI: 10.1016/j.spa.2022.08.008

Adaptive invariant density estimation for continuous-time mixing Markov processes under sup-norm risk
(with Claudia Strauch and Lukas Trottner)
Annales de l'Institut Henri Poincaré B (Probab. et Stat.) 58 (2022), no. 4, pp. 2029–2064.
DOI: 10.1214/21-aihp1235

Preprints

Improving the Convergence Rates of Forward Gradient Descent with Repeated Sampling (2024)
(with Johannes Schmidt-Hieber)
under review, arXiv: 2411.17567.

Data-driven optimal stopping: A pure exploration analysis (2023)
(with Sören Christensen and Claudia Strauch)

in revision for resubmission, arXiv: 2312.05880

In Preparation

A spike-timing-dependent BCM model
(with Sascha Gaudlitz and Johannes Schmidt-Hieber)

Statistics for large language models
(with Insung Kong, Richard Samworth and Johannes Schmidt-Hieber)

Transfer learning for PCA
(with Anna Sepliarskaia)

Training of deep Heaviside networks
(with Insung Kong and Johannes Schmidt-Hieber)

Statistical inference for time-dependent Heaviside networks
(with Insung Kong and Johannes Schmidt-Hieber)

Sparse drift estimation for Lévy-driven Ornstein–Uhlenbeck processes from discrete observations
(with Natalia Jeszka)

Awards

Award for best master's degree in Mathematics, University of Mannheim	2019
Award for best bachelor's thesis in Mathematics, University of Mannheim	2016

Teaching/Supervision

University of Twente

Supervision

Co-supervision of PhD student Natalia Jeszka (with Johannes Schmidt-Hieber)	since Fall 2024

Aarhus University

Lecturing

Statistics for Stochastic Processes	Spring 2024

Supervision

Co-supervision of two master's theses on data-driven optimal control	Spring 2023+2024

Tutoring

Introduction to Probability Theory and Statistics	Fall 2023
Risk	Spring 2023
Statistical Theory	Fall 2021
Introduction to Probability Theory and Statistics	Fall 2021
Mathematical Statistics	Spring 2021
Nonparametric Statistics	Spring 2021
Reinforcement Learning	Fall 2020
Introduction to Probability Theory and Statistics	Fall 2020
Calculus	Fall 2020

University of Mannheim

Tutoring

Stochastics I	Fall 2019
Probability Theory I	Spring 2019
Introduction to Probability Theory	Fall 2017

Professional Activities

Presentations and Seminars

Stochastics Seminar, Stuttgart University *invited talk (planned)*	November 2025
65th ISI World Statistics Congress, Den Haag (The Netherlands) *invited talk*	October 2025
11th International Conference on Lévy Processes, Sofia (Bulgaria) *invited talk*	July 2025
Stochastics Seminar, Karlsruhe Institute of Technology *invited talk*	July 2025
Stochastics Seminar, Bielefeld University *invited talk*	June 2025
Workshop on the Statistical Theory of Neural Networks, Egmond aan Zee (The Netherlands) *invited talk*	May 2025
Frontiers of Statistics and Machine Learning (Junior Session), Oberwolfach (Germany) *invited talk*	March 2025
German Probability and Statistics Days 2025, Dresden (Germany)	March 2025
Seminar Department of Mathematics, Kiel University *invited talk*	Feb. 2025
Dynstoch 2024, Kiel (Germany)	May 2024
Stochastics Seminar, Aarhus University *invited talk*	March 2024
Workshop on Stochastic Analysis and Statistics, Tokyo (Japan) *invited talk*	Feb. 2024
Young Researchers in Stochastic Control and Games, Bielefeld (Germany) *invited talk*	Dec. 2023
43rd Conference on Stochastic Processes and their Applications, Lisbon (Portugal)	July 2023
European Meeting of Statisticians 2023, Warsaw (Poland)	July 2023
Workshop on Stochastic Dynamic Games and Related Topics, Kiel (Germany) *invited talk*	March 2023
German Probability and Statistics Days 2023, Essen (Germany)	March 2023
Seminar Department of Mathematics, Kiel University *invited talk*	July 2022
German Probability and Statistics Days 2021, Mannheim (Germany)	Sep. 2021
Stochastics Seminar, Aarhus University *invited talk*	Oct. 2020
Bernoulli-IMS One World Symposium 2020	Aug. 2020
German Probability and Statistics Days 2020, Dresden (Germany)	March 2020 (cancelled)
Seminar Department of Mathematics, Kiel University *invited talk*	Feb. 2020
Stochastics Seminar, University of Heidelberg/Mannheim *invited talk*	Nov. 2019

Research Stays

Research stay with Richard Samworth at the University of Cambridge	Sep. 2025
Research visit at the Simons Institute for the Theory of Computing with Johannes Schmidt-Hieber, Berkeley (California)	Oct. 2024

Spring/Summer/Fall Schools

Hausdorff School: High-Dimensional Statistics, Bonn	July 2021
RTG1953 Fall School on Causal Inference and Stein's method, Mannheim	Nov. 2019
Satellite Summer School to the 9th International Conference on Lévy Processes, Athens	July 2019

Refereeing

Annals of Statistics, Journal of Statistical Planning and Inference, Bernoulli, Electronic Journal of Probability, Stochastic Processes and their Applications, ALEA, Journal of Nonparametric Statistics, Statistical Inference for Stochastic Processes

References

Johannes Schmidt-Hieber, Professor of Statistics, Department of Applied Mathematics (DAMUT), University of Twente
✉ a.j.schmidt-hieber@utwente.nl

Claudia Strauch, Professor for Statistics, Institute for Mathematics, Heidelberg University
✉ strauch@math.uni-heidelberg.de

Sören Christensen, Professor for Probability and Statistics, Department of Mathematics, Kiel University
✉ christensen@math.uni-kiel.de