

Karolina Klockmann, PhD

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Research Interests

Privacy-preserving machine learning, biomedical image processing of sparse data, sensor-based trajectory analysis, Bayesian modeling, uncertainty quantification, statistical inference for dependent data.

Experience

- since 2024 **Substitute Professor**, *University of Kassel*, Stochastics & Analysis
- since 2023 **Postdoctoral Researcher**, *University of Vienna*, Statistical Methods
- 2020–2023 **Research Assistant**, *University of Vienna*, Statistical Methods
- 2019–2020 **Research Assistant**, *University of Göttingen*, Statistical Methods
- 2018–2019 **Student Assistant**, *Fraunhofer IAIS*, Knowledge Discovery, Sankt Augustin
- 7–9/2017 **Intern in Risk Management**, *Deutsche Bank*, Risk Methodologies, Frankfurt
- 2016–2017 **Student Assistant**, *Fraunhofer ITWM*, Financial Mathematics, Kaiserslautern
- 2015–2016 **Student Assistant**, *vwd group*, Interface Development, Kaiserslautern

Education

- 2019–2023 **PhD** in Statistics, *University of Vienna*
- 2016–2019 **Master of Science** in Financial Mathematics, *University of Kaiserslautern*
- 2017–2018 Semester abroad, *Sorbonne University*, Paris
- 2013–2016 **Bachelor of Science** in Mathematics, *University of Kaiserslautern*
- 2015–2016 Semester abroad, *Chalmers University of Technology*, Gothenburg

Dissertation

- Title On Periodograms and Efficient Nonparametric Toeplitz Covariance Matrix Estimators
- Supervisor Prof. Dr. Tatyana Krivobokova
- Reviewers Prof. Cristina Butucea, Prof. Dr. Jens-Peter Kreiß
- Description Two novel data-driven nonparametric methods for estimating Toeplitz covariance matrices in different scenarios are proposed. Their theoretical properties and practical applications are discussed.

Publications

Peer-reviewed

- 2024 Klockmann and Krivobokova: On second-order statistics of the log-average periodogram for Gaussian processes, *IEEE Signal Processing Letters*, DOI:10.1109/LSP.2024.3483033
- 2024 Klockmann and Krivobokova: Efficient nonparametric estimation of Toeplitz covariance matrices, *Biometrika*, DOI: 10.1093/biomet/asae002
- 2022 Krivobokova, Serra, Rosales and Klockmann: Joint non-parametric estimation of mean and auto-covariances for Gaussian processes, *Computational Statistics & Data Analysis*, DOI: 10.1016/j.csda.2022.107519

Preprint

- 2025 Butucea, Klockmann and Krivobokova: Nonparametric spectral density estimation using interactive mechanisms under local differential privacy, [arXiv:2504.00919](https://arxiv.org/abs/2504.00919)

Software

- R package vstdct - Nonparametric estimation of Toeplitz covariance matrices ([CRAN](https://cran.r-project.org/web/packages/vstdct/index.html))

Reviewing Activities

- since 2023 Peer Reviewer for Journal TEST, Spanish Society of Statistics and Operations Research

Talks

- 7/2025 **Invited**, *European Young Statistician Meeting*, Turin
- 3/2025 **Contributed**, *German Probability and Statistics Days*, Dresden
- 2/2025 **Seminar Talk**, University of Kassel
- 1/2025 **Seminar Talk**, TU Braunschweig
- 12/2024 **Invited**, *IMS Intl. Conference on Statistics and Data Science*, Nice
- 7/2024 **Contributed**, *Intl. Symposium on Nonparametric Statistics*, Braga
- 10/2023 **Invited**, *Oskar Morgenstern Doctoral School Opening Celebration*, Vienna
- 7/2023 **Contributed**, *European Meeting of Statisticians*, Warsaw
- 12/2022 **Invited**, *16th Intl. Conference on Computational and Financial Econometrics*, London
- 6/2022 **Contributed**, *Intl. Symposium on Nonparametric Statistics*, Paphos
- 9/2021 **Contributed**, *German Probability and Statistics Days*, Mannheim
- 9/2021 **Contributed**, *Royal Statistical Society 2021 Intl. Conference*, Manchester

Research Stays

- 11/2022 **CREST ENSAE**, Paris, group of Prof. Cristina Butucea, one month

- 9/2022 **Summer School**, *Klagenfurt*, Modern Topics in Time Series Analysis
8/20218 **Summer School**, *Lviv*, Lviv Data Science Summer School

Teaching

- 2025 **Lecture**, *Applied Statistics*, graduate level, English, University of Kassel
2025 **Lecture**, *Elementare Analysis*, undergraduate level, German, University of Kassel
2024 **Lecture**, *Elementare Arithmetik und Zahlentheorie*, undergraduate level, German, University of Kassel
2024 **Seminar**, *Stochastics*, undergraduate level, German, University of Kassel
2024 **Seminar**, *Analysis*, undergraduate level, German, University of Kassel
2024 **Exercise Class**, *Analysis*, undergraduate level, German, University of Vienna
2023-2024 **Exercise Class**, *Probability Theory*, undergraduate level, German, University of Vienna
2023 **Repetitorium**, *Statistics 1*, undergraduate level, German, University of Vienna
2021-2023 **Exercise Class**, *Statistics 1*, undergraduate level, German, University of Vienna
2017 **Exercise Class**, *Analysis*, undergraduate level, German, University of Kaiserslautern

Scholarships, Grants & Awards

- 2023 **Award of Excellence**, *Austrian Federal Ministry for Education, Science and Research*, National Award for the Top 40 dissertations in Austria in 2022/23
2022 **Small Research Grant**, *University of Vienna*, support for early career researchers
2017-2018 **Erasmus**, *Sorbonne University*, Paris, graduate studies
2018 **DAAD Go East**, *DAAD*, Participation at Lviv Data Science Summer School, Ukraine
2015-2016 **Erasmus**, *Chalmers University of Technology*, Gothenburg, undergraduate studies
2014-2016 **Deutschlandstipendium**, *University of Kaiserslautern*, undergraduate studies

Conference & Workshop Organization

- 2/2025 **Day of Mathematics**, *University of Kassel*, co-organization of the math laboratory

Skills

- Languages German (native language), English (fluent), French (fluent)
Programming R, Python, Matlab, SAS, Mathematica, git