# Dr. Rouven Michels

## Personal Information


- **Born:** 23.02.1994 in Wickede (Ruhr)
- **Address:** Fröbelstraße 12, 33604 Bielefeld
- **E-mail:** rouven.michels@tu-dortmund.de


## Professional and Academic Experience

**Technical University of Dortmund** — Dortmund
Research Associate in the Statistical Methods for Big Data group — since October 2024

**Bielefeld University** — Bielefeld
Research Associate in the Statistics and Data Analysis group — October 2020 - September 2025
Research Associate in the Sports Science AB V group — October 2020 - September 2024

**KPMG AG** — Bielefeld/Frankfurt am Main
Associate in (Quantitative) Risk Management — May 2019 - September 2020
Working Student and Intern in Credit Risk — February 2018 - December 2018

**Bielefeld University** — Bielefeld
Student/Research Assistant and Academic Advisor — October 2015 - March 2019

**Zurich AG** — Bonn
Intern in Actuarial Department — August 2015 - September 2015

## Education

**Bielefeld University** — Bielefeld
PhD Candidate at the Faculty of B.A. and Economics (summa cum laude) — October 2020 - June 2024

- Thesis: Statistical Inference for Stochastic Process Models in Sports Analytics

**Bielefeld University** — Bielefeld
Bachelor & Master of Science in Business Mathematics — October 2013 - April 2019

## Miscellaneous

- **Applications:** 2nd place for the position "Associate Professor for Sports and Data Analytics" at UMCG.
- **Awards:** Student prize winner of the RSS Women's World Cup 2023 Prediction Competition
  Best Student Presentation Award at the IWSM 2024 in Durham, UK
  Honorable Mention at the NFL Big Data Bowl 2024
- **Scientific Activities:** Associate Editor of the Journal of Sports Analytics
  Member of the Sports – Training and Research in Data Science Methods for Analytics and Injury Prevention Group (S-TRAINING)
- **Software Skills:** R (excellent knowledge), Python (basic knowledge), Microsoft Office (excellent knowledge)
- **Languages:** German (native speaker), English (business fluent), Spanish (good basic knowledge)
- **Hobbies:** Playing football, road cycling, and groundhopping

## Selected Research

Bajons, Robert, Koslik, Jan-Ole, Michels, Rouven, and Ötting, Marius (2025). "PEP: a tackle value measuring the prevention of expected points". *Journal of Quantitative Analysis in Sports*. im Druck.

Karlis, Dimitris, Michels, Rouven, and Ötting, Marius (2025). "Modelling handball outcomes using univariate and bivariate approaches". *Statistical Methods & Applications*. im Druck.

Koslik, Jan-Ole, Feldmann, Carlina C, Mews, Sina, Michels, Rouven, and Langrock, Roland (2025). "Inference on the state process of periodically inhomogeneous hidden Markov models for animal behavior". *The Annals of Applied Statistics* **19**: (4), 2724–2737.

Michels, Rouven and Langrock, Roland (2025). "Nonparametric estimation of bivariate hidden Markov models using tensor-product B-splines". *Statistical Modelling*. im Druck.

Michels, Rouven, Ötting, Marius, and Karlis, Dimitris (2025). "Extending the Dixon and Coles model: an application to women's football data". *Journal of the Royal Statistical Society Series C: Applied Statistics* **74**: (1), 167–186.

Winkelmann, David and Michels, Rouven (2025). "Momentum effects in team sports: analyzing the interplay between offense and defense in the NBA". *The American Statistician*. im Druck.

Winkelmann, David, Michels, Rouven, and Deutscher, Christian (2025). "Predicting Qualification Thresholds in UEFA's incomplete round-robin tournaments". *arXiv preprint arXiv:2508.20075*.

Adam, Timo, Ötting, Marius, and Michels, Rouven (2024). "Markov-switching decision trees". *AStA Advances in Statistical Analysis* **108**: (2), 461–476.

Michels, Rouven and Koslik, Jan-Ole (2024). "On the combination of data smoothing and Markov-switching models". *Journal of the Royal Statistical Society Series C: Applied Statistics* **73**: (3), 557–560.

Oelschläger, Lennart, Adam, Timo, and Michels, Rouven (2024). "fHMM: Hidden Markov Models for Financial Time Series in R". *Journal of Statistical Software* **109**, 1–25.

Ötting, Marius, Michels, Rouven, Langrock, Roland, and Deutscher, Christian (2024). "Demand for live betting: An analysis using state-space models". *Applied Stochastic Models in Business and Industry* **40**: (2), 527–541.

Michels, Rouven, Ötting, Marius, and Langrock, Roland (2023). "Bettors' reaction to match dynamics: Evidence from in-game betting". *European Journal of Operational Research* **310**: (3), 1118–1127.

## Selected Teaching Courses

- Hidden Markov and State Space Models (Lecture), ST 2025
- Visualisation of Sports Data (Seminar), ST 2025
- Soccer Analytics (Seminar), WT 2024/25
- Introductory Case Studies (Practical Session), WT 2024/25
- Supervision of Bachelor's and Master's Theses, WT 2020/21 - ST 2025
- Statistical Consulting (P), WT 2022/23 - WT 2024/25
- Research Methods in Sports Economics (Seminar), STs 2021, 2022, 2023, 2024
- Reading Course "Statistische Wissenschaften" (Seminar), WTs 2022/23 & WTs 2023/24
- Exercises on Hidden Markov Models, ST 2022
- Organization of the 10th Young Researchers Workshop of the Centre for Statistics, March 2022
- Exercises on Generalized Linear Models, WT 2021/22

## Selected Talks

- The Best of Both Worlds: Predicting Football Coverages with Supervised and Unsupervised Learning, NESSIS, Harvard, Cambridge, September 2025

- Forecasting In-Game Win Probabilities in Handball: Evaluating the Impact of Goalkeeper Substitution, 7th Joint Statistical Meeting of the Deutsche Arbeitsgemeinschaft Statistik, Berlin, March 2025
- Latent Markov Models and their applications in Sports Analytics, SFU Sports Analytics Seminar (invited), Burnaby, September 2024
- Inferential tools for hidden Markov models with periodic components, 38th International Workshop on Statistical Modelling, Durham, July 2024
- Tree-based regression within a hidden Markov model framework, CLADAG, Salerno, September 2023
- Modelling women's football scores, RSS International Conference (invited), Harrogate, September 2023
- Using tensor product B-splines for nonparametric inference in multivariate hidden Markov models, IMS ICSDS, Florence, December 2022
- Using tensor product B-splines for nonparametric inference in multivariate hidden Markov models, 6th Joint Statistical Meeting of the Deutsche Arbeitsgemeinschaft Statistik, Hamburg, March 2022