

Filip Schlembach

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RESEARCH

I work on conformal prediction for multivariate regression and time-series forecasting. My thesis investigates methods to construct hyperrectangular prediction regions that stay jointly valid on non-exchangeable data while being less conservative than the standard Bonferroni construction. Beyond my thesis I am interested in the connection between conformal prediction and decision theory, and in the relationship between conformal prediction regions and highest probability density region estimation. A more detailed description of my work is available at research.schlembach.be.

EDUCATION

PhD

Apr 2023 – present

Maastricht University, Department of Advanced Computing Sciences (DACS), The Netherlands

- Supervisors: [Mark H. M. Winands](#) and [Evgueni Smirnov](#)
- Thesis to be submitted in November 2026, defence expected in the first half of 2027
- Started as an external candidate under a hospitality agreement while employed at adesso SE

M.Sc. Data Science for Decision Making

Sep 2020 – Dec 2022

Maastricht University, DACS, The Netherlands

- Final grade 8.5/10
- Thesis: *Conformal Multistep-Ahead Multivariate Time-Series Forecasting*, graded 10/10 and awarded the department's Master Thesis Award. Published in *Machine Learning*, see [1] below

Visiting student

Apr 2022 – Aug 2022

University of Sydney, School of Computer Science, Australia

- Research collaboration with Professor Irena Koprinska on my master's thesis

B.Sc. Scientific Programming

Sep 2017 – Jul 2020

FH Aachen, Germany

- Final grade 1.8 (German scale, 1.0 best)
- Thesis: *Generating synthetic fundus images using generative adversarial networks (Erzeugung Synthetischer Fundusbilder mit Hilfe von Generative Adversarial Networks)*
- Focus on data science and machine learning

Coursework towards BAS Sciences de l'Ingénieur

Sep 2013 – Jun 2017

Université de Liège, Belgium

- Orientation Ingénieur civil. Coursework completed before transferring to FH Aachen

PUBLICATIONS

Grouped by the role I played. Numbering of the thesis publications matches research.schlembach.be.

PhD thesis

- [4] **Tightening Hyperrectangular Conformal Prediction Regions for Multi-Target Regression under Non-exchangeability**

F. Schlembach, D. Mertens Velasquez, E. Smirnov, M. H. M. Winands

Manuscript submitted for publication, 2026

- [3] **Corrected Max-Rank for Finite-Sample Conformal Prediction**

F. Schlembach, E. Smirnov, M. H. M. Winands

Proceedings of the Fifteenth Symposium on Conformal and Probabilistic Prediction with Applications, PMLR 329:199–221, 2026.

- [2] **Dynamic Conformal Prediction for Multi-Target Regression: Optimising Informational Efficiency under Joint Validity**
F. Schlembach, E. Smirnov, M. H. M. Winands
Proceedings of the Fourteenth Symposium on Conformal and Probabilistic Prediction with Applications, PMLR 266:193–213, 2025
- [1] **Conformal multistep-ahead multivariate time-series forecasting**
F. Schlembach, E. Smirnov, I. Koprinska, M. H. M. Winands
Machine Learning, 114(7):165, 2025

Supervised student projects

Bachelor's and master's thesis projects I co-supervised, published with the student as first author.

- **Electric-Vehicle Charging Scheduling under Grid-Capacity and Charging Lower-Bounds**
B. Cavalcanti Lauro, M. Mihalák, F. Schlembach, E. Smirnov
Proceedings of the 26th Symposium on Algorithmic Approaches for Transportation Modelling, Optimization, and Systems, 2026. In press
- **MyQuantitative: Risk-Aware Multi-Agent Portfolio Construction with Conformal Prediction**
A. Roy Thompson, F. Schlembach, M. Glazunov, E. Smirnov
Machine Learning and Principles and Practice of Knowledge Discovery in Databases, 2026. In press
- **Testing Marginal and Conditional Coverage in Conformal Prediction for Non-Stationary Time Series via Value-at-Risk Backtesting**
K. Retzlaff, F. Schlembach, D. Bams, P. Dreesen
Proceedings of the Fourteenth Symposium on Conformal and Probabilistic Prediction with Applications, PMLR 266:725–747, 2025

Other collaborations

- **Bootstrapped Chains for Learning Using Privileged Information**
E. Smirnov, F. Schlembach
The Importance of Being Learnable: Essays Dedicated to Alexander Gammernan, LNCS 16290:144–156, 2026
- **Classify-and-Count with Prediction Sets: A Conformal Approach to Label Distribution Estimation**
E. Smirnov, F. Schlembach
Proceedings of the 5th International Workshop on Learning to Quantify, 2025

TEACHING

Teaching assistant, Maastricht University (DACS)

Sep 2024 – present

Held as part of the PhD.

- [KEN4113 Data Mining](#), MSc Artificial Intelligence and MSc Data Science for Decision Making
- [SCI2036 Artificial Intelligence](#), BSc University College Maastricht
- Supervising tutorials, lecturing in a limited capacity, and grading. Both courses coordinated by Evgueni Smirnov

Teaching assistant, Maastricht University (DACS)

Sep 2021 – Jan 2022

Held part time alongside the M.Sc.

- Introduction to Programming, Maastricht Science Programme
- Machine Learning and Calculus, BSc Data Science and Artificial Intelligence

AWARDS

Alexey Chervonenkis Award for Best Student Paper Fifteenth Symposium on Conformal and Probabilistic Prediction with Applications	2026
Master Thesis Award Department of Advanced Computing Sciences, Maastricht University	2022

PROFESSIONAL EXPERIENCE

Researcher, Maastricht University (DACS) Research on predictive uncertainty quantification, with teaching and supervision duties.	Dec 2024 – Nov 2026
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Associate Consultant Data Science & AI, adesso SE Aachen, Germany	Sep 2022 – Nov 2024
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- Developed and operationalised machine learning models
- Data understanding, analysis and preparation in close collaboration with the clients' domain experts
- Pursued the PhD in parallel with this role

Advanced Technology Intern, Accenture Heerlen, The Netherlands	Aug 2021 – Jan 2022
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- Predictive modelling and prediction interval estimation for solar power forecasting

ICT Consultant, agineo GmbH Aachen, Germany	Jun 2017 – Jul 2021
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- Analysis of clients' IT infrastructure and business processes
- ServiceNow customisation, interface development, and software development in JavaScript
- Held alongside the B.Sc. and the first year of the M.Sc.

ICT Technician, Pro-Tech Service Raeren, Belgium. IT services and infrastructure administration for small local businesses.	Sep 2010 – Jun 2017
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SKILLS AND LANGUAGES

Technical. Python, PyTorch, scikit-learn, NumPy, pandas, Git, LaTeX, JavaScript.

Languages. German and French (native), English (fluent), Dutch.