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TRANSREGIO Express

Transregio 391-Newsletter, Edition No.1

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Dear colleagues and friends,

It's hard to believe that our TRR is now running for almost six months already. At our first retreat last November at Parkhotel Lüdenscheid, more than 75 scientists shared their first results, and we charted the exciting path ahead. One of the highlights was the vibrant scientific speed dating among our young researchers. It was great to witness such a dynamic exchange of ideas and the birth of new collaborations.
Our next retreat is already in the works for November 13-14. All topic circles have held their kick-off meetings and our research school STAIRS has hosted its first events, setting the stage for further impactful activities. This year, several topic circles organise workshops, and STAIRS offers a summer school. Our coordinator Julia Dröpper and I have recently visited potential locations for our TRR conference in 2026.
These milestones are just the beginning! I am eagerly looking forward to the inspiring discussions, collaborative efforts, and groundbreaking results that lie ahead when tackling the challenges of the energy and transport transition. Thanks a lot for your inspiring energy and enthusiasm, and thanks to Julia and Christina, who substitutes Jonas during his parental leave, for setting up this first newsletter of our TRR!

With warm regards
Roland Fried

Honors and Awards

We are happy to congratulate our TRR members Nadja Klein (A07) and Timm Faulwasser (B02) on their recent awards.

Timm Faulwasser will receive the European Control Award 2025 at the annual European Control Conference on June 2025. This award acknowledges his outstanding contributions as a young researcher in the field of systems and control.

Nadja Klein has been honored with the Emerging Leaders Award by the Committee of Presidents of Statistical Societies (COPSS). This award recognizes her remarkable contributions to statistical science, in particular Bayesian deep learning, computational methods and spatial statistics, and her commitment to impactful research, mentorship, professional service and ensuring the accessibility of methods and software to researchers and practitioners.

We congratulate both for their well-deserved recognition and their outstanding contributions to scientific research.

TRR Retreat November, 2024. © S. Ferber/TU Dortmund

TRANSREGIO EXPRESS

Save the dates

Call for Papers for the Special Issue "New Statistical Methods in the Context of Energy Transition". Deadline for full paper: November 15, 2025. Guest editors are Roland Fried, Jethro Browell, Deniz Sezer and Florian Ziel. More details here.

STAIRS Summer School June 12-14, 2025, TU Dortmund University. For details see page 3.

Topic Circle Workshops

TC06: Prediction
April 4-5, 2025, IBZ, TU Dortmund
International Workshop in Econometrics
Please let us know via email at econ-ws@statistik.tu-dortmund.de if you plan to attend. There is only a limited number of seats available for the conference dinner so we may not be able to accommodate all.
Contact persons: Christoph Hanck, Matei Demetrescu, Carsten Jentsch

TC01: Experimental Design
September 26-27, 2025, SRG1/1.001, TU Dortmund.
Workshop on "Robust Statistics and Experimental Design for Spatio-temporal Data"
Contact persons: Christine Müller, Kirsten Schorning

STAIRS / TRR Retreat 2025

STAIRS Retreat: November 12, 2025, Welcome Hotels, Paderborn, Germany

TRR 391 Retreat: November 13-14, 2025, Welcome Hotels, Paderborn, Germany

STAIRS

STAIRS Seminar

The STAIRS seminar was held at TU Dortmund University on January 22. The seminar, which now takes place once a semester, offers doctoral students participating in the STAIRS program the opportunity to foster interdisciplinary exchange. Focusing on “High-Dimensionality in STAIRS: Find your connections!”, the participants networked and discussed the topic of high-dimensionality in research and application.

Workshop "Research Data Management"

The first STAIRS-internal workshop on "Research Data Management" took place at the end of January. A total of twelve participants joined the on-site workshop at TU Dortmund University on January 30. Thanks to the active support of TU Dortmund University's research data management team (special thanks to Bernd Zey and Wibke Kleina), the INF project (especially Philip Raatz, Helena Rahaus and Patrick Thiel) and Edzer Pebesma, we were able to shed light on the topic of research data management from different perspectives in three modules. Among other things, the participants learned how to use GitHub and independently developed a data management plan for their dissertation project.

Lively scientific speed dating by STAIRS participants at the TRR retreat 2024 © M. Jakubzik/TU Dortmund

STAIRS (continued)

Summer School

June 12-14, 2025
With Sayar Karmakar from the University of Florida and Matteo Fasiolo from the University of Bristol, two outstanding lecturers await you. The three-day Summer School will feature both theoretical and practical sessions in the computer lab. The Summer School will be complemented by an attractive social program.

Hidden Curriculum

November 6, 2025
In cooperation with the RGS Econ and the RTG "Regional Disparities and Economic Policy", STAIRS is offering a full-day workshop entitled "The Hidden Curriculum". It will be held by Prof. Daniel I. Rees, a professor in the Department of Economics at the Universidad Carlos III de Madrid. The workshop is subtitled "Everything You Weren't Taught in Graduate School about Doing Applied Research", and is intended to serve as a practical guide for doctoral students in applied research. Among other things, it will cover the nuts and bolts of writing and publishing.

TRR Research Seminar

Last semester, we have hosted six lecturers:

Philipp Sibbertsen, Leibniz University Hannover: Modeling and Forecasting the Long Memory of Cyclical Trends in Paleoclimate Data

Mark Merner /Unsplash

Eugen J./Unsplash

Otilia Boldea, Tilburg University: Inference About Impulse Responses Based On External Instruments

Timo Dimitriadis, Heidelberg University: Asymptotic Inference for Score Decompositions

Paul Elhorst, University of Groningen: Estimation of Large Three-Dimensional Panels with Fixed Effects and Spatial Lags

David Rügamer, LMU Munich: Regression in the Age of Neural Networks: Tackling Scale and High Dimensionality

Melanie Birke, University Bayreuth: Testing for independence and functional regression models

In the next summer term, the following guests have already agreed to present their work at our Research Seminar:

Gabriel Ahlfeldt, Peter Winker, Alexander Marx, Sophie Langer, Anna Malinovskaya, Arturas Juodis, Fabrice Gamboa
You can find an up-to-date list on our website. All seminars are also listed in the TRR calendar so that you don't miss any information about talks if you subscribe to it.

Miscellaneous

Andreas Groll (A02, INF) will organize a session on "Advances in the Modelling of Spatio-Temporal Data" at IES 2025 in Bressanone, Italy, June 25-27.

Johannes Lederer (A02, A05) hosts a Podcast called Data Science Talks.

Hanna Meyer (A05) and **Jakub Nowosad** from Münster University organize an international workshop on "Advances in Spatial Machine Learning", 24-25 May 2025 in Münster.

On February 24, 2025, a coordination meeting took place for all employees who are responsible for the administrative support of the TRR. There was a lively exchange and many open questions could be clarified. The corresponding PowerPoint presentation can be downloaded from Nextcloud under Handouts.

TRR website

Our TRR website is now set up. We look forward to your feedback and regular suggestions for news to be published there.

Youtube channel @TRR391-spatio-temporal

TRR 391 launched its YouTube channel including the first two recordings of talks from our TRR Research Seminar.

We will continue to make future talks available, so that you can access them via our TRR Research Seminar overview page at your convenience.

TRR working paper series has started

In this series, researchers of TRR 391 can publish, share and get feedback on their work within the TRR and beyond, already before it has been published in peer-reviewed journals or proceedings.

American Public Power Association/Unsplash

Our first publication in the TRR Working Paper Series is „Individual mobility and public transport subsidies“ by Mark Andreas Andor, Joschka Flintz and Colin Vance.

All publications in the series will be permanently available via Eldorado. The complete list of all peer-reviewed articles and working papers can be found on our website.

And more...

For newcomers to TRR391 who want to improve their statistical background knowledge, the DKZ.2R provides valuable guidance:

The Rhine-Ruhr Center for Scientific Data Literacy offers free, tailored support to researchers facing data-related challenges in their projects.

They support researchers from various disciplines in navigating the challenges of complex data analysis, research data management, high-performance computing, and artificial intelligence.

For details, visit here.

Publications

Books

Lederer, J. (2025). A first course in statistical learning: with data examples and Python code. *Springer Statistics and Computing.* DOI: 10.1007/978-3-031-30276-3.

Peer-reviewed articles (accepted)

Faymonville, M., Jentsch, C., & Weiß, C.H. (2024). *Semi-parametric goodness-of-fit testing for INAR models. to appear in Bernoulli. Link to Preprint: https://www.bernoullisociety.org/publications/bernoulli-journal/bernoulli-journal-papers*

Golestaneh, P., Taheri, M., & Lederer, J. (2025). *How many samples are needed to train a deep neural network? to appear in ICLR 2025. Available on arXiv DOI: 10.48550/arXiv.2405.16696.*

Peer-reviewed articles (published)

Bruns, M., & Keweloh S. A. (2025). *Testing for strong exogeneity in proxy-VARs. Journal of Econometrics, 245 (1-2). DOI: 10.1016/j.jeconom.2024.105876.*

Demetrescu, M., & Hillmann, B. (2025). *Gaussian inference in predictive regressions for stock returns. Journal of Financial Econometrics, 23(2), nbaf004. DOI: 10.1093/jjfinec/nbaf004.*

Dohme, H., Malchercyzk, D., Leckey, K., & Müller, C. H. (2024). *K-depth tests for testing simultaneously independence and other model assumptions in time series. Communications in Statistics - Simulation and Computation, 1–19. DOI: 10.1080/03610918.2024.2413905*

Hanck, C., & Massing, T. (2024). *Testing for nonlinear cointegration under heteroskedasticity. Econometric Reviews, 44(4), 512–543. DOI: 10.1080/07474938.2024.2429598.*

Lederer, J., & von Sachs, R. (2025). *Simultaneous estimation of stable parameters for multiple autoregressive processes from datasets of nonuniform sizes. Journal of Time Series Analysis. DOI: 10.1111/jtsa.12806.*

Zimmermann, M., & Ziel, F. (2025). *Efficient mid-term forecasting of hourly electricity load using generalized additive models. Applied Energy, 388. DOI: 10.1016/j.apenergy.2025.125444.*

Working Papers

Andor, M.A., Flintz, J., Vance, C. (2025). *Individual mobility and public transport subsidies. TRR 391 Working Paper #1. DOI: 10.17877/DE290R-25228.*

Bai, L., Dette, H., Wu, W. (2025). *A portmanteau test for multivariate non-stationary functional time series with an increasing number of lags. arXiv. DOI: 10.48550/arXiv.2501.00118.*

Bastian, P. (2024). *Detecting relevant deviations from the white noise assumption for non-stationary time series. arXiv. DOI: 10.48550/arXiv.2411.06909.*

Bastian, P. (2025). *Choosing the right norm for change point detection in functional data. arXiv. DOI: 10.48550/arXiv.2501.04476.*

Bastian, P., Basu, R., Dette, H. (2025). *Uniform confidence bands for joint angles across different fatigue phases. arXiv. DOI: 10.48550/arXiv.2502.08430.*

Bastian, P., Dette, H., Heinrichs, F. (2025). *Sequential outlier detection in non-stationary time series. arXiv. DOI: 10.48550/arXiv.2502.18038.*

Boulin, A. (2024). *Estimating max-stable random vectors with discrete spectral measure using model-based clustering. arXiv. DOI: 10.48550/arXiv.2402.01609.*

Bücher, A., Dette, H. (2024). *On the lack of weak continuity of Chatterjee's correlation coefficient. arXiv. DOI: 10.48550/arXiv.2410.11418.*

Dette, H., Kroll, M. (2024). *Detecting practically significant dependencies in infinite dimensional data via distance correlations. arXiv. DOI: 10.48550/arXiv.2411.16177.*

Gierse, J., Fried, R. (2024). *Nonparametric directional variogram estimation in the presence of outlier blocks. arXiv. DOI: 10.48550/arXiv.2412.01464.*

Molodchyk, O., Schmitz, P., Engelmann, A., Worthmann, K., & Faulwasser, T. (2025). *Towards data driven multi-stage OPF. arXiv. DOI: 10.48550/arXiv.2502.01545.*

Molodchyk, O., Teutsch, J., Faulwasser, T. (2024). *Towards safe Bayesian optimization with Wiener kernel regression. arXiv. DOI: 10.48550/arXiv.2411.02253.*

Uniejewski, B., Ziel, F. (2025). *Probabilistic forecasts of load, solar and wind for electricity price forecasting. arXiv. DOI: 10.48550/arXiv.2501.06180.*

Yuan, Z., & Dette, H. (2025). *Exponential inequalities for some mixing processes and dynamic systems. arXiv. DOI: 10.48550/arXiv.2208.11481.*

Talks

(ordered chronologically)

Invited Talks

Hanna Meyer (A05): Remote Sensing and Machine Learning for Environmental Monitoring: Opportunities and Challenges. AI for Good (Online), February 26, 2025.

Johannes Lederer (A02, A05): The Role of Mathematics in AI. ICORS 2025, Stresa, Italy, May 19-23, 2025.

Hanna Meyer (A05) Machine learning as a tool to map the world? Challenges and perspectives of spatial predictive mapping of the environment. Spatial Statistics 2025, Noordwijk, Netherlands, July 15-18, 2025.

Conferences

Maxime Faymonville (A03), Carsten Jentsch (A03, C01), Efstathios Paparoditis: Predictive inference for discrete-valued time series. CMStatistics, London, UK, 14-16 December 14-16, 2024.

Maxime Faymonville (A03), Carsten Jentsch (A03, C01), Efstathios Paparoditis: Predictive inference for discrete-valued time series. Stochastiktage 2025, Dresden, Germany, March 11-14, 2025.

Antonio Fioravanti (A03), Carsten Jentsch (A03, C01): Tapered covariance matrix estimation for lattice processes. Stochastiktage 2025, Dresden, Germany, March 11-14, 2025.

Carsten Jentsch (A03, C01), Barbara Brune, Jonathan Flossdorf: Goodness-of-fit testing based on graph functionals for homogeneous Erdös-Rényi graphs. Stochastiktage 2025, Dresden, Germany, March 11-14, 2025.

Daniel Dzikowski (C01), Carsten Jentsch (A03, C01): Structural periodic vector autoregressions. DAGStat 2025, Berlin, Germany, March 24-28, 2025.

Roland Fried (A04, B02), Jana Gierse (B02): On the robust estimation of autocorrelations in the presence of outliers and shifts. ICORS 2025, Stresa, Italy, May 19-23, 2025.

Sheila Görz (A04), Roland Fried (A04, B02): From time series to spatial data: a generalized approach for change detection. DAGStat 2025, Berlin, Germany, March 24-28, 2025.

Christine Müller (B01): Multivariate sign depth and related distribution-free tests for model fit. DAGStat 2025, Berlin, Germany, March 24-28, 2025.

Matei Demetrescu (A06, C03): Detecting the predictive power of imperfect predictors with smoothly varying components. 11th International Congress of Econometrics and Empirical Economics, Palermo, Italy, May 29-31, 2025.

Research Seminars and Workshops

Matei Demetrescu (A06, C03): Tests of no cross-sectional error dependence in panel quantile regressions. Alfred Weber Institute for Economics, Heidelberg, Germany, November 11, 2024.

Matei Demetrescu (A06, C03): Detecting the predictive power of imperfect predictors with slowly varying components. Research Seminar of the Institute of Economics & Association of Freiburg Economists, Freiburg, Ger-many, December 5, 2024.

Christoph Hanck (A06, C01): Predictive regressions under heteroskedasticity. Ökonomisches Forschungsseminar University of Münster, Münster, Germany, January 15, 2025.

Johannes Lederer (A02, A05): From high-dimensional statistics to deep learning. Workshop on the Statistical Theory of Neural Networks, Egmond aan Zee, Netherlands, May 5-8, 2025.

Matei Demetrescu (A06, C03): Assessing loss preferences on the basis of noisy forecast errors. Institute of Econometrics and Statistics of University of Cologne, Cologne, Germany, May 6, 2025.

Johannes Lederer (A02, A05): Statistics in the era of AI. Workshop on Advances in high-dimensional and time series statistics. Louvain-La-Neuve, Belgium, September 11, 2025.