

Curriculum vitae

of Mario Ullrich

Personal data

Name Dr. Mario Ullrich
Born March 3, 1987 in Mühlhausen, Germany
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Research areas

In general Approximation theory; information-based complexity; theoretical data science; applied harmonic analysis; probability theory; uniform distribution theory

In detail Complexity of high-dimensional numerical integration and approximation; power of random information; asymptotic geometric analysis; large random matrices; discrepancy and dispersion of point sets; applied number theory; mixing of stochastic processes

Education

12/12 Ph.D. in Mathematics (Dr. rer. nat.),
Friedrich Schiller University Jena, Germany.
Thesis: “Rapid mixing of Swendsen-Wang dynamics in two dimensions”
(*summa cum laude*)
Advisor: Erich Novak
Supported by: DFG Research Training Group (1523/1)
“Quantum and Gravitational Fields”

07/09 Dipl.-Math. in Mathematics,
Friedrich Schiller University Jena, Germany.
Thesis: “Explicit error bounds and comparison of Importance
sampling and the Metropolis algorithm” (in German)

07/05 Abitur,
Seiler-Gymnasium in Schlotheim, Germany.

Professional experience

- 03/19– Assistant Professor (Universitätsassistent) at JKU Linz, Austria (permanent position)
- 05/20–01/22 Associated researcher at the *Moscow Center for Fundamental and Applied Mathematics* at the Lomonosov Moscow State University, Russia.
- 10/18–03/19 Visiting Professor (Vertretungsprofessor-W3) for “Theoretical Numerics” at Friedrich Schiller University Jena, Germany
- 03/15–09/18 Assistant Professor (Universitätsassistent) at JKU Linz, Austria
- 01/13–02/15 Post-Doc (wiss. Mitarbeiter) at FSU Jena, Germany
- 07/12–12/12 Postdoctoral fellowship at Università Roma Tre, Rome.
Supported by: ERC Advanced Grant 228032
“Phase transitions in random evolutions of large-scale structures” (PTRELSS)
- 09/09–07/12 Ph.D. student at Friedrich Schiller University Jena, Germany.
Supported by: DFG Research Training Group 1523/1
“Quantum and Gravitational Fields”
- 10/07–06/09 Undergraduate teaching assistant in probability theory
Friedrich Schiller University Jena, Germany.

Awards

- 2021 *Joseph F. Traub Prize for Achievement in Information-Based Complexity*
- 2019 *Journal of Complexity Best Paper Award*
for the article “The curse of dimensionality for numerical integration on general domains” [J. Complexity 50 (2019), 25–42]
- 2015 *Information-Based Complexity Young Researcher Award*
- 2013 *Promotionspreis des Dekans* of the Friedrich Schiller University

Most important invitations

- 2022 Invited mini-symposium organizer at the annual meeting of the *Austrian*

Mathematical Society on “High-dimensional approximation”,
Graz, Austria, September 2023.

- 2022 Plenary speaker at *International Conference on “Function Spaces and Applications”*, Apolda/Thür., Germany, Oct 2022 (postponed from 2020)
- 2022 Invited mini-symposium organizer at *Curves and Surfaces 2022* on “Random matrices and approximation using function values”, Arcachon, France, June 2022
- 2022 Invited speaker at the *MASCOT-NUM Workshop “Optimal Sampling for Approximation”*, Institut Henri Poincaré, Paris, France, March 2022
- 2021 Invited speaker (2 lectures) at the conference “*Sampling recovery and related problems*” at the Laboratory of High-Dimensional Approximation and Applications, Moscow, Russia, May 2021 (online)
- 2020 Plenary speaker at “*14th International Conference in Monte Carlo & Quasi-Monte Carlo Methods in Scientific Computing*” (MCQMC 2020) at Oxford University, UK, August 2020 (online).
- 2017 Invited speaker at *LMS Durham Research Symposium “Markov Processes, Mixing Times and Cutoff”* at the Durham University, UK, July 2017
- 2017 Semi-plenary speaker at the *Information-based Complexity workshop* at the FoCM 2017 conference, Barcelona, July 2017
- 2016 Invited speaker at “*Approximate Counting, Markov Chains and Phase Transitions*” workshop at the Simons Institute for the Theory of Computing, Berkeley, February 2016

Visiting professorships and appointment procedures

10/18–03/19 Visiting professor (Vertretungsprofessur-W3) for “Theoretical Numerical Analysis” at Friedrich Schiller University Jena, Germany (I was offered to take over the next semester as well.)

- Invitations:
- 2022: FAU Erlangen-N. (W3, chair of “Data Science”, shortlisted)
 - 2022: TU Ilmenau (W3, “Math. of Data Science”, shortlisted)
 - 2021: Universität Passau (W3, chair of “Functional analysis”)
 - 2018: EKV Tübingen (tenure-track W3, “Math. methods in CS”)
 - 2017: FAU Erlangen-Nürnberg (W1, “Applied mathematics”, possibly shortlisted, procedure cancelled)

Teaching activities

Special courses:

- WS 21/22 *Practical Work in Artificial Intelligence* (JKU Linz, practical training)
- WS 20/21 *Structure of random point sets* (JKU Linz, seminar)
- WS 19/20 *Approximation theory and Machine learning* (JKU, Linz, seminar)
- SS 19 *High-dimensional numerical approximation* (JKU Linz, MSc seminar)
- WS 18/19 *Modern applications of harmonic analysis* (FSU Jena, seminar)
- WS 18/19 *Complexity theory for continuous problems* (FSU Jena, lecture)
- SS 18 *Information-based complexity* (JKU Linz, lecture)
- WS 17/18 *High-dimensional numerical integration* (JKU Linz, lecture)
- WS 17/18 *Discrepancy and numerical integration* (JKU Linz, seminar)
- SS 17 *Modern applications of harmonic analysis* (JKU Linz, seminar)
- WS 16/17 *Levin's discrepancy bound for lattices* (JKU Linz, research seminar)
- SS 16 *Modern methods in Approximation theory* (JKU Linz, lecture)
- SS 16 *Optimal algorithms for numerical integration* (JKU Linz, seminar)

Basic courses:

- WS 22/23 *Mathematics for Artificial Intelligence 3* (JKU Linz, lecture)
- SS 22 *Mathematics for Artificial Intelligence 2* (JKU Linz, lecture)
- WS 21/22 *Mathematics for Artificial Intelligence 1* (JKU Linz, lecture)
- SS 21 *Seminar on "Mathematics in AI"* (JKU Linz, seminar)
- WS 20/21 *Mathematics for Artificial Intelligence 3* (JKU Linz, lecture)
- SS 20 *Mathematics for Artificial Intelligence 2* (JKU Linz, lecture)
- SS 20 *Mathematics for Artificial Intelligence 1* (JKU Linz, only online lecture)
- WS 19/20 *Mathematics for Artificial Intelligence 1* (JKU Linz, lecture)
- SS 19 *Mathematics for Biological Chemists 2* (JKU Linz, lecture)
- WS 18/19 *Harmonic analysis* (FSU Jena, lecture)
- SS 17 *Classical harmonic analysis* (JKU Linz, lecture)
- WS 16/17 *Complex analysis* (JKU Linz, lecture & exercise)
- others ~15 exercises/tutorials in analysis, numerical analysis, statistics and probability theory starting WS 07/08 (FSU Jena, JKU Linz)

Special teaching service:

- 2019– Responsible for design and implementation of the “Mathematics for Artificial Intelligence 1–3” lecture series for the new “Artificial Intelligence” studies at the JKU Linz:
- Goal: Math on the level of “Math for Physicists” adjusted to AI topics
 - designed for distance learning (live streaming, recording, online service)
 - cooperation with the Linz School of Education
- 2020– Development of the specialization “Mathematical Foundation of AI” in the AI studies; new Master track as of WS 23/24.

Most Important Publications (chronological order)

1. A sharp upper bound for sampling numbers in L_2
(with M. Dolbeault and D. Krieg).
Appl. Comput. Harmon. Anal. 63 (2023), 113–134,
DOI:10.1016/j.acha.2022.12.001, arXiv:2204.12621.
2. Function values are enough for L_2 -approximation (with D. Krieg).
Found. Comput. Math. 21 (2021), 1141–1151
DOI:10.1007/s10208-020-09481-w, arXiv:1905.02516.
3. Random sections of ellipsoids and the power of random information
(with A. Hinrichs, D. Krieg, E. Novak and J. Prochno).
Trans. Amer. Math. Soc. 374 (2021), no. 12, 8691–8713,
DOI:10.1090/tran/8502, arXiv:1901.06639.
4. The Curse of Dimensionality for Numerical Integration of Smooth Functions
(with Aicke Hinrichs, Erich Novak and Henryk Woźniakowski).
Math. Comp. 83 (2014), no. 290, 2853–2863,
DOI:10.1090/S0025-5718-2014-02855-X, arXiv:1211.0871.
5. Rapid mixing of Swendsen-Wang dynamics in two dimensions.
Dissertationes Math. 502 (2014), 64 pp.,
DOI:10.4064/dm502-0-1, arXiv:1212.4908.

Full Publication List

Online archives:

- Scopus: www.scopus.com/authid/detail.uri?authorId=55781373500
- MathSciNet: www.ams.org/mathscinet/search/author.html?mrauthid=1023200
- ArXiv: www.arxiv.org/find/math/1/au:+Ullrich_M/0/1/0/all/0/1

Theses:

2. *Rapid mixing of Swendsen-Wang dynamics in two dimensions*, Dissertation, 2012, Jena (cf. the paper [9])
1. *Explicit error bounds and comparison of Importance sampling and the Metropolis algorithm* (in German), Diploma thesis, 2009, Jena

Refereed journal papers:

37. Exponential tractability of L_2 -approximation with function values (with D. Krieg, P. Siedlecki and H. Woźniakowski). to appear in *Adv. Comput. Math.*, arXiv:2205.04141.
36. A sharp upper bound for sampling numbers in L_2 (with M. Dolbeault and D. Krieg). *Appl. Comput. Harmon. Anal.* 63 (2023), 113–134, DOI:10.1016/j.acha.2022.12.001, arXiv:2204.12621.
35. Deterministic constructions of high-dimensional sets with small dispersion (with J. Vybíral). *Algorithmica* 84 (2022), 1897–1915, DOI:10.1007/s00453-022-00943-x, arXiv:1901.06702.
34. Function values are enough for L_2 -approximation: Part II (with D. Krieg). *J. Complexity* 66 (2021) DOI:10.1016/j.jco.2021.101569, arXiv:2011.01779.
33. On the worst-case error of least squares algorithms for L_2 -approximation with high probability. *J. Complexity* 60 (2020), DOI:10.1016/j.jco.2020.101484, arxiv:2003.11947.
32. Function values are enough for L_2 -approximation (with D. Krieg). *Found. Comput. Math.* 21 (2021), 1141–1151, DOI:10.1007/s10208-020-09481-w, arXiv:1905.02516.

31. Random sections of ellipsoids and the power of random information (with A. Hinrichs, D. Krieg, E. Novak and J. Prochno). *Trans. Amer. Math. Soc.* 374 (2021), no. 12, 8691–8713, DOI:10.1090/tran/8502, arXiv:1901.06639.
30. On the power of random information (with A. Hinrichs, D. Krieg, E. Novak and J. Prochno). In: F.J. Hickernell, P. Kritzer (eds.), *Multivariate Algorithms and Information-Based Complexity*, pp. 43–64, DeGruyter, Berlin/Boston, 2020. arXiv:1903.00681.
29. On the fixed volume discrepancy of the Fibonacci sets in the integral norms (with V.N. Temlyakov). *J. Complexity* 61 (2020), DOI:10.1016/j.jco.2020.101472, arXiv:1908.04658.
28. Numerical performance of optimized Frolov lattices in tensor product reproducing kernel Sobolev spaces (w/ C. Kacwin, J. Oettershagen and T. Ullrich). *Found. Comput. Math.* 21 (2021), 849–889, DOI:10.1007/s10208-020-09463-y, arXiv:1802.08666.
27. On a multi-dimensional Poissonian pair correlation concept and uniform distribution (with A. Hinrichs, L. Kaltenböck, G. Larcher and W. Stockinger). *Monatsh. Math.* 190 (2019), no. 2, 333–352, DOI:10.1007/s00605-019-01267-9, arXiv:1809.05672.
26. The minimal k -dispersion of point sets in high-dimensions (with A. Hinrichs, J. Prochno and J. Vybíral). *J. Complexity* 51 (2019), 68–78, DOI:10.1016/j.jco.2018.10.001, arXiv:1807.01492.
25. A note on the dispersion of admissible lattices. *Discrete Appl. Math.* 257 (2019), 385–387, DOI:10.1016/j.dam.2018.08.032, arXiv:1710.08694.
24. The curse of dimensionality for numerical integration on general domains (with A. Hinrichs and J. Prochno). *J. Complexity* 50 (2019), 25–42, DOI:10.1016/j.jco.2018.08.003, arXiv:1804.03957.
23. Comparison of hit-and-run, slice sampling and random walk Metropolis (with Daniel Rudolf). *J. Appl. Probab.* 55 (2018), no. 4, 1186–1202, DOI:10.1017/jpr.2018.78, arXiv:1505.00579.
22. Lattice rules with random n achieve nearly the optimal $\mathcal{O}(n^{-\alpha-1/2})$ error independently of the dimension (with P. Kritzer, F. Y. Kuo and D. Nuyens).

- J. Approx. Theory* 240 (2019), 96–113,
DOI:10.1016/j.jat.2018.09.011, arXiv:1706.04502.
21. Digital net properties of a polynomial analogue of Frolov’s construction (with J. Dick, F. Pillichshammer, K. Suzuki and T. Yoshiki).
Finite Fields Appl. 51 (2018), 325–350,
DOI:10.1016/j.ffa.2018.02.004, arXiv:1712.06831.
 20. Reproducing Kernels of Sobolev Spaces on \mathbb{R}^d and Applications to Embedding Constants and Tractability (with E. Novak, H. Woźniakowski and S. Zhang).
Analysis and Applications 16 (2018), no. 5, 693–715,
DOI:10.1142/S0219530518500094, arXiv:1709.02568.
 19. An upper bound on the minimal dispersion (with J. Vybíral).
J. Complexity 45 (2018), 120–126,
DOI:10.1016/j.jco.2017.11.003, arXiv:171006754.
 18. Lattice based integration algorithms: Kronecker sequences and rank-1 lattices (with J. Dick, F. Pillichshammer, K. Suzuki and T. Yoshiki).
Ann. Mat. Pura Appl. (4) 197 (2018), no. 1, 109–126,
DOI:10.1007/s10231-017-0670-3, arXiv:1608.08687.
 17. A lower bound for the dispersion on the torus.
Math. Comput. Simulation 143 (2018), 186–190,
DOI:10.1016/j.matcom.2015.12.005, arXiv:1510.04617.
 16. A Monte Carlo method for integration of multivariate smooth functions.
SIAM J. Numer. Anal. 55 (2017), no. 3, 1188–1200,
DOI:10.1137/16M1075557, arXiv:1604.06008.
 15. Product rules are optimal for numerical integration in classical smoothness spaces (with A. Hinrichs, E. Novak and H. Woźniakowski).
J. Complexity 38 (2017), 39–49,
DOI:10.1016/j.jco.2016.09.001, arXiv:1604.00261.
 14. Complexity of oscillatory integrals on the real line (with E. Novak, H. Woźniakowski and S. Zhang).
Adv. Comput. Math. 43 (2017), 537–553,
DOI:10.1007/s10444-016-9496-6, arXiv:1511.05414.
 13. Change of variable in spaces of mixed smoothness and numerical integration of multivariate functions on the unit cube (with V. K. Nguyen and T. Ullrich).
Constr. Appr. 46 (2017), 69–108,
DOI:10.1007/s00365-017-9371-9, arXiv:1511.02036.
 12. The role of Frolov’s cubature formula for functions with bounded mixed derivative (with Tino Ullrich).

- SIAM J. Numer. Anal.* 54 (2016), no. 2, 969–993,
DOI:10.1137/15M1014814, arXiv:1503.08846.
11. On “Upper error bounds for quadrature formulas on function classes” by K. K. Frolov. In: R. Cools and D. Nuyens (Eds): *Monte Carlo and Quasi-Monte Carlo Methods*, Springer Proceedings in Mathematics & Statistics, Vol. 163 (2016), 571–582,
DOI:10.1007/978-3-319-33507-0_31, arXiv:1404.5457.
 10. Complexity of Oscillatory Integration for Univariate Sobolev Spaces (with Erich Novak and Henryk Woźniakowski).
J. Complexity 31 (2014), no. 1, 15–41,
DOI:10.1016/j.jco.2014.07.001, arXiv:1311.1528.
 9. Rapid mixing of Swendsen-Wang dynamics in two dimensions.
Dissertationes Math. 502 (2014), 64 pp.,
DOI:10.4064/dm502-0-1, arXiv:1212.4908.
 8. On weak tractability of the Clenshaw-Curtis Smolyak algorithm (with Aicke Hinrichs and Erich Novak).
J. Approx. Theory 183 (2014), 31–44,
DOI:10.1016/j.jat.2014.03.012, arXiv:1301.4055.
 7. Structure and eigenvalues of heat-bath Markov chains (with Martin Dyer and Catherine Greenhill).
Linear Algebra Appl. 454 (2014), 57–71,
DOI:10.1016/j.laa.2014.04.018, arXiv:1309.0360.
 6. The Curse of Dimensionality for Numerical Integration of Smooth Functions II (with Aicke Hinrichs, Erich Novak and Henryk Woźniakowski).
J. Complexity 30 (2014), no. 2, 117–143,
DOI:10.1016/j.jco.2013.10.007, arXiv:1304.3372.
 5. The Curse of Dimensionality for Numerical Integration of Smooth Functions (with Aicke Hinrichs, Erich Novak and Henryk Woźniakowski).
Math. Comp. 83 (2014), no. 290, 2853–2863,
DOI:10.1090/S0025-5718-2014-02855-X, arXiv:1211.0871.
 4. Swendsen-Wang is faster than single-bond dynamics.
SIAM J. Discrete Math. 28 (2014), no. 1, 37–48,
DOI:10.1137/120864003, arXiv:1201.5793.
 3. Positivity of hit-and-run and related algorithms (with Daniel Rudolf).
Electron. Commun. Probab. 18 (2013), no. 49, 1–8,
DOI:10.1214/ECP.v18-2507, arXiv:1212.4512.

2. Comparison of Swendsen-Wang and Heat-Bath Dynamics.
Random Structures Algorithms 42 (2013), no. 4, 520–535,
DOI:10.1002/rsa.20431, arXiv:1105.3665.
1. Exact Sampling for the Ising Model at all Temperatures.
Monte Carlo Methods Appl., 223–233, De Gruyter Proc. Math, De Gruyter,
Berlin, 2013, arXiv:1012.3944.

Preprints and others:

2. Heat-bath Markov chains have no negative eigenvalues (with Catherine Greenhill). *Preprint*, arXiv:1301.4055v1.
1. Rapid mixing of Swendsen-Wang and single-bond dynamics in two dimensions. *Preprint*, arXiv:1202.6321.

Some other invited visits

- “30th birthday of Acta Numerica”, Banach Center, Bedlewo, PL, June 2022
- ESI Program “Optimal Point Configurations on Manifolds”, Erwin Schrödinger Institute, Vienna, Austria, Jan 2022
- ESI Program “Applied Functional Anal. & High-Dimensional Approximation”, Erwin Schrödinger Institute, Vienna, Austria, Apr 2021
- Dagstuhl Seminar 19341 on “Algorithms and Complexity for Continuous Problems”, Schloss Dagstuhl, Leibniz Center for Informatics, Germany, Aug 2019
- Workshop: “Challenges in optimal recovery and hyperbolic cross approximation”, Newton Institute for Mathematical Sciences, Cambridge, UK, Feb 2019
- University of Passau (invited by T. Müller-Gronbach), Germany, Jan 2019
- University of Osnabrück (invited by Michael Gnewuch), Germany, Dec 2018
- Special semester: “Multivariate Algorithms and their Foundations in Number Theory”, Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austrian Academy of Sciences, Linz, Austria, Oct–Dec 2018
- Mini-conference “High-dimensional approximation and discretization”, Laboratory of High-Dimensional Approximation and Applications, Lomonosov Moscow State University, Moscow, Russia, Sep 2018
- Closing workshop of the “Graduiertenkolleg 1523”, Germany, March 2018
- ESI Program “Tractability of High Dimensional Problems and Discrepancy”, Erwin Schrödinger Institute, Vienna, Austria, Sep–Oct 2018
- Oberwolfach Workshop 1706c on “Perspectives in High-dimensional Probability and Convexity”, Germany, Feb 2017
- Workshop in Discrepancy Theory, Villa Cipressi, Varenna, June 2016
- Hausdorff Center for Mathematics (invited by Tino Ullrich), Bonn, Germany, Mar 2016
- Dagstuhl Seminar 15391 on “Algorithms and Complexity for Continuous Problems”, Schloss Dagstuhl, Leibniz Center for Informatics, Germany, Sep 2015
- University of Geneva (invited by Ioan Manolescu), Switzerland, May 2015
- Conference on “Information-based complexity”, Banach Center, Bedlewo, Poland, Apr 2015
- IBC workshop at “Foundations of Computational Mathematics conference” (FoCM 2014), Montevideo, Uruguay, Dec 2014
- ESI Programm “Minimal Energy Point Sets, Lattices, and Designs”, Erwin Schrödinger Institute, Vienna, Austria, Oct 2014
- Hausdorff Center for Mathematics (invited by Tino Ullrich), Bonn, Germany, Apr 2014

- Workshop: “Discrepancy, Numerical Integration and Hyperbolic Cross Approximation”, Hausdorff Center for Mathematics, Bonn, Germany, Sep 2013
- Dagstuhl Seminar 12391 on “Algorithms and Complexity for Continuous Problems”, Schloss Dagstuhl, Leibniz Center for Informatics, Germany, Sep 2012
- University of Roma Tre (invited by Fabio Martinelli), Rome, Italy, May 2012
- Hausdorff Trimester Program “Analysis and Numerics for High Dimensional Problems”, Hausdorff Institute, Bonn, Germany, June/July 2011

Some selected talks

- Monte Carlo and Quasi-Monte Carlo Methods “MCQMC 2020”, *Plenary talk*, Oxford, UK, Aug 2020 (held online)
Talk: *Random vs. optimal information for L_2 -approximation*
- Dagstuhl Seminar “Algorithms and Complexity for Continuous Problems”, Schloss Dagstuhl, Leibniz Center for Informatics, Germany, Aug 2019
Talk: *Discrepancy, Dispersion and Fixed Volume Discrepancy*
- Workshop: “Challenges in optimal recovery and hyperbolic cross approximation”, Newton Institute for Mathematical Sciences, Cambridge, UK, Feb 2019
Talk: *Deterministic constructions of point sets with small dispersion*
- Ninth International Conference on Numerical Methods and Applications “NMA’18”, Borovets, Bulgaria, Aug 2018
Talk: *Integration of Smooth Functions using Random Point Sets*
- ESI Program “Tractability of High Dimensional Problems and Discrepancy”, Vienna, Oct 2017
Talk: *The inverse of the dispersion depends logarithmically on the dimension*
- New Perspectives in Function spaces and Applications “NPFSA 2017”, Bedlewo, Poland, Sep 2017,
Talk: *Monte Carlo methods for numerical integration*
- Foundations of Computational Mathematics “FoCM 2017”, *Semi-plenary talk*, Barcelona, Spain, July 2017
Talk: *Optimal algorithms for numerical integration: a (personal) survey*
- Workshop in Discrepancy Theory, Villa Cipressi, Varenna, Italy, June 2016
Talk: *Product rules are optimal for classical smoothness spaces*
- Research seminar “Mathematics of Computation”, HCM Bonn, Mar 2016
Talk: *On a Monte Carlo method for smooth functions*

- International Congress on Industrial and Appl. Math. “ICIAM 2015”,
Beijing, China, Aug 2015
Talk: *A universal cubature formula for functions with mixed smoothness*
- Mathematical Physics seminar of Stanislaw Smirnov and Ioan Manolescu,
University of Geneva, Switzerland, May 2015
Talk: *Dynamics for the random-cluster model on the square lattice*
- Conference on Information-based Complexity “IBC 2015”,
Bedlewo, Poland, Apr 2015
Talk: *Numerical integration of functions with bounded mixed derivative*
- Foundations of Computational Mathematics “FoCM 2014”,
Montevideo, Uruguay, Dec 2014
Talk: *Numerical integration of functions with mixed smoothness*
- ESI Program “Minimal Energy Point Sets, Lattices, and Designs”,
Vienna, Oct 2014
Talk: *Frolov cubature in Besov spaces with mixed smoothness*
- Monte Carlo and Quasi-Monte Carlo Methods “MCQMC 2014”,
Leuven, Belgium, Apr 2014
Talk: *Complexity of Oscillatory Integration*
- Random Structures and Algorithms Conference "RSA 2013",
Poznań, Poland, Aug 2013
Talk: *Rapid mixing for the non-critical random-cluster model on the lattice*
- German-Polish Joint Conference on Probability and Mathematical Statistics,
Toruń, Poland, June 2013
Talk: *Rapid mixing of Swendsen-Wang for the two-dimensional Ising model*
- Probability seminar, University of Roma Tre, Rome, May 2012
Talk: *Rapid mixing of the Swendsen-Wang process for the 2d Ising model at all temperatures*
- Monte Carlo and Quasi-Monte Carlo Methods “MCQMC 2012”,
Sydney, Feb 2012
Talk: *Tight mixing bounds at the Potts transition point for single-bond dynamics on the torus*
- IMACS Seminar on Monte Carlo Methods “MCM 2011”,
Borovets, Bulgaria, Aug 2011
Talk: *Swendsen-Wang beats Heat-bath*
- Workshop on High-Dimensional Approximation “HDA 2011”,
Hausdorff Institute, Bonn, June 2011
Talk: *Swendsen-Wang beats Heat-bath*

Students

- Gernot Zöcklein - Bachelor (AI), 2022, JKU Linz
Topic: “Spectral Graph Theory and Sparsification”
- Johannes Zischg - Bachelor (AI), 2022, JKU Linz
Topic: “Uniform Pooling”
- Fabian Steigersdorfer - Bachelor (AI), 2022, JKU Linz
Topic: “Markov chains and the Ising model”
- Johannes K. Kröpfl - Bachelor (AI), 2022, JKU Linz
Topic: “Brownian Motion and Stochastic Calculus for deriving the Black-Scholes-Merton Model of Investing”
- Raphael-Pascal Endstrasser - Bachelor (AI), 2022, JKU Linz
Topic: “Model identification of ARIMA processes”
- Julian Hofstadler - Master, 2021, JKU Linz
- Stefan Stockinger - Bachelor, 2020, JKU Linz
- Lukas Weissinger - Bachelor, 2019, JKU Linz
- Julian Hofstadler - Bachelor, 2019, JKU Linz
- Mathias Sonnleitner - Master, jointly with Prof. A. Hinrichs, 2019, JKU Linz
- Sebastian Falkensteiner - Master, jointly with Prof. Hinrichs, 2016, JKU Linz
- David Krieg - Master, jointly with Prof. Dr. E. Novak, 2016, FSU Jena
- David Krieg - Bachelor, jointly with Prof. Dr. E. Novak, 2014, FSU Jena
- Florian Blöthner - Diplom, jointly with Prof. Dr. E. Novak, 2011, FSU Jena

Scientific community service

- Organization:
- Mini-symposium on “High-dimensional approximation” at annual meeting of the Austrian Math. Society (with D. Krieg), Graz, Austria, Sep 2023.
 - Conference “Approximation and Geometry in High Dimensions 2022”, Banach Center, Bedlewo, Poland, www.impan.pl/.
 - Special session on “Approximation from random data” at “MCQMC 2022” (with D. Krieg), Linz, Austria, July 2022
 - Mini-symposium on “Random matrices and approximation using function values” at “Curves and Surfaces 2022”, Arcachon, France, June 2022
 - Special session on “Random Points: Quality Criteria and Applications” at “MCQMC 2020” (with M. Gnewuch), Oxford University, UK, online

- “Discretization” section of the conference "Approximation Theory and Applications" (dedicated to the 100th anniversary of S.B. Stechkin) at Steklov Institute of Mathematics, Moscow, Russia, August 2020
- Conference “Approximation and Geometry in High Dimensions 2020”, Banach Center, Bedlewo, Poland, postponed
- Special session “Dispersion and Applications” at “MCQMC 2018”, Rennes, France
- Co-organization of the “Joint Austrian-Czech Analysis Seminar 2018”, Traunkirchen, Austria
- Special session “Integration, Approximation and Discrepancy” at “ICIAM 2015”, Beijing, China
- Special session “Tractability of integration and approximation” with A. Hinrichs at “MCQMC 2014”, Leuven, Belgium

- Administration:
- Deputy mid-level staff speaker of the *Fachbereich* (~math. department) at JKU since May 2022
 - Member of the study commission for the course “Artificial Intelligence” at JKU since Sep 2019
 - Responsible for design and implementation of the new “Math for Artificial Intelligence” courses at JKU since Feb 2019
 - Contact person (“Mentor”) for first year students in mathematics at JKU Linz, Oct 2017 – Sep 2019
 - Responsible for IT of the Institute of Analysis at JKU Linz, Mar 2016 – Nov 2019
 - Mid-level staff representative of the Institute of Analysis in the *Institutsversammlung* at JKU Linz since Jan 2016
 - Member of the appointment committee for “Mathematical optimization” at FSU Jena, 2015

Editor for: J. Complexity

Referee for: Advances in Computational Math., Ann. Inst. Henri Poincaré Probab. Stat., Applied Numerical Mathematics, Bulletin of Brazilian Mathematical Society, Communications in Math. Physics, Contemporary Mathematics, Constructive Approximation, Electronic Communications in Probability, Foundations of Computational Mathematics, IEEE Open J. Signal Processing, J. Approxi-

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- Proceedings: Curves and Surfaces, Dagstuhl, FOCS, MCM, MCQMC, RANDOM, SLOAN80, SODA, STOC
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Miscellaneous

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