Jan Vybíral

Curriculum Vitae

Personal data:

Born: September 2, 1979 in Hranice, Czechoslovakia

Address: Department of Mathematics
Faculty of Nuclear Sciences and Physical Engineering
Czech Technical University
Trojanova 13
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Citizenship: Czech Republic

Education:

2017:	Habilitation at Charles University, Prague, Czech Republic Thesis: Functions and sequences in analysis and applications
2011:	Habilitation at Friedrich-Schiller University Jena, Germany Academic degree: Dr. rer. nat. habil. Habilitation thesis: *Decomposition methods and their applications in the theory of function spaces* Lehrprobe: *Zufällige Matrizen: Lemma von Johnson und Lindenstrauss*
2009:	Academic degree RNDr., awarded by the Charles University, Prague, Czech Republic
2008:	Graduated at the Charles University Academic degree: Ph.D. Dissertation: *Fine properties of Sobolev embeddings* Supervisor: Prof. Luboš Pick
2005:	Graduated at Friedrich-Schiller University, Jena, Germany Academic degree: Dr. rer. nat., *summa cum laude* Dissertation: *Function spaces with dominating mixed smoothness* Supervisors: Prof. Hans-Jürgen Schmeisser and Prof. Winfried Sickel
2002–2005:	Ph.D. studies at the Graduate School *Approximation and Algorithmic Methods* Friedrich-Schiller University, Jena, Germany

2002:	Graduated at the Charles University, Prague, Czech Republic Academic degree: Mgr. Diploma thesis: *Optimality of function spaces for boundedness of integral operators and Sobolev embeddings* Supervisor: Prof. Luboš Pick.
1997–2002:	Undergraduate study at the Faculty of Mathematics and Physics of the Charles University, Prague, Czech Republic.
1993–1997:	Mathematical high school in Bílovec, Czech Republic.

Professional experience:

April – September 2022:	Guest Professor, Fakultät für Mathematik Technische Universität München, Garching, Germany
October 2017 – now:	Associate Professor, Department of Mathematics Faculty of Nuclear Sciences and Physical Engineering Czech Technical University, Prague
January 2017 – September 2017:	Associate Professor, Department of Mathematical Analysis Faculty of Mathematics and Physics, Charles University, Prague
July 2014 – December 2016:	Research Assistant, Department of Mathematical Analysis Faculty of Mathematics and Physics, Charles University, Prague
April 2012 – June 2014:	*Leader of the Young Research Group "Applied Functional Analysis"*, MATHEON, TU Berlin, Germany.
October 2009 – March 2012:	Research Assistant, RICAM, Linz, Austria in the FWF Start Project *Sparse Approximation and Optimization in High Dimensions* supervised by Prof. Massimo Fornasier.
April 2006 – September 2009:	Research Assistant, Friedrich–Schiller University, Jena Supervisor: Prof. Erich Novak.
October 2005 – March 2006:	Research Assistant in the project DFG Hi 584/2-2 Supervisor: Prof. Aicke Hinrichs.

Awards:

2019	*Joseph F. Traub Prize for Achievement in Information-Based Complexity*
2017–	Three *"Best Teacher's awards"* of the Dean of the Faculty of Nuclear Sciences and Physical Engineering, Czech Technical University
2015–17	Four *"Best Teacher's awards"* of the Dean of the Faculty of Mathematics and Physics, Charles University
2015	*Research grant of the private Neuron Foundation.*
2013	*Travel grant of Institute for Pure and Applied Mathematics (IPAM), UCLA.*
2013	*Elected into Postdoctoral Faculty of Berlin Mathematical School.*
2008	*Information-Based Complexity Young Researcher Award.*
2005	*Promotionspreis* of the Friedrich-Schiller University.
2002	*Bolzano's prize*, awarded by the Charles University.

2002 *First prize in the competition "Students Scientific and Expert Activity"* in the section Mathematical Analysis, awarded by Mathematics Research Section of the Union of Czech Mathematicians and Physicists.

1997 *Silver medal at the* 38^{th} *International Mathematical Olympiad in Argentina.*

Grants and third-party funding:

Investigator:
January 2023 – now: P202/23/04720S of the Grant Agency of the Czech Republic, co-investigator, principal investigator: Prof. Luboš Pick
January 2016 – December 2018: Neuron research grant: Reconstruction of structured data – theory and applications.
November 2012 – June 2015: Project of the DFG Research Center MATHEON: *A23: Tractable recovery of multivariate functions from limited number of samples.*
2013: DFG-Conference Support for MATHEON Workshop "Compressed Sensing and its Applications", December 2013, Berlin.
Member of the team:
March 2020 – December 2021: Time-Frequency Representations for Function Spaces (TIFREFUS – multilateral project)
January 2018 – June 2021: P201/18/00580S of the Grant Agency of the Czech Republic, Prof. Luboš Pick
January 2017 – December 2018: Time-Frequency Analysis, Methods for Operators and Function Spaces (TIFMOFUS – multilateral project)
July 2014 – August 2017: ERC CZ LL1203 of the Czech Ministry of Education, Prof. Stanislav Hencl
October 2009 – March 2012: FWF Start Project *Sparse Approximation and Optimization in High Dimensions*, Prof. Massimo Fornasier
October 2005 – March 2006: DFG Hi 584/2-2 of Prof. Aicke Hinrichs

Students:

Matěj Trödler - Bachelor, 10/2022 – now, Czech Technical University, Prague
Daniel Khol - Bachelor, 10/2020 – 9/2022, Czech Technical University, Prague
Adam Šumník - Master, 10/2021 – now, Czech Technical University, Prague
Adam Šumník - Bachelor, 10/2020 – 09/2021, Czech Technical University, Prague
Jan Trödler - Master, 10/2020 – 06/2022, Czech Technical University, Prague
Jiří Chmel - Master, 09/2019 – 06/2022, Czech Technical University, Prague
Jan Trödler - Bachelor, 09/2019 – 09/2020, Czech Technical University, Prague
Anna Doležalová - Master, 09/2018 – 09/2019, Charles University, Prague
Marta Kossaczká - Bachelor, 01/2016 – 09/2016, Charles University, Prague
Ekkehard Schnoor - Master, 09/2015 – 06/2016 (jointly with Prof. Dr. Gitta Kutyniok, TU Berlin)
Anton Kolleck - PhD, 01/2013 – 03/2017 (since 2015 jointly with Prof. Dr. Gitta Kutyniok, TU Berlin)

Teaching activities:

Advanced lectures:

SS 21/22 **Harmonic analysis** at Technical University Munich (2SWS)

SS 21/22	**Modern Approximation Theory** at Technical University Munich (4SWS)
SS 21/22	**Seminar on Information Based Complexity** at Technical University Munich (2SWS)
WS 21/22 – now	**Introduction to probability** at Czech Technical University (2SWS)
WS 18/19 – now	**Random Matrix Theory** at Czech Technical University (2SWS)
WS 18/19 – now	**Compressed Sensing** at Czech Technical University and Charles University Prague (2 SWS)
WS 17/19 – now	**Theory of random processes** at Czech Technical University (3SWS)
SS 17/18 – now	**Markov processes** at Czech Technical University (2SWS)
SS 16/17	**Interpolation theory II** at Charles University (2 SWS)
WS 16/17	**Random Matrices and Matrix Completion** at TU Berlin (Block course of 10 lectures)
WS 16/17	**Interpolation theory I** at Charles University (2 SWS)
WS 15/16	**Non-asymptotic analysis of random matrices** at Charles University (2 SWS)
WS 14/15	**Compressed Sensing** at Charles University Prague (2 SWS)
SS 14	**Geometry of highdimensional spaces** at TU Berlin (2 SWS)
WS 13/14	**Harmonic analysis** at TU Berlin (2 SWS)
SS 13	**Mathematical Introduction to Compressed Sensing** at TU Berlin (4 SWS)
WS 12/13	**Functional analysis II** at TU Berlin (4 SWS)
SS 09	**Modern Approximation Theory** with exercises at FSU Jena (4 SWS)

Basic courses:

SS 16/17	Mathematical Analysis II for Physics at Charles University (4 SWS)
WS 16/17	Mathematical Analysis I for Physics at Charles University (4 SWS)
WS 15/16	Mathematical Analysis I for Physics at Charles University (4 SWS)
SS 15	Mathematical Analysis II for Computer Science at Charles University (2 SWS)
WS 14/15	Mathematical Analysis I for Computer Science at Charles University (2 SWS)

I have given also numerous Exercises, Tutorials and Seminars at Charles University, FSU Jena, and Czech Technical University

Publications:

Research profiles:
Google Scholar: `http://scholar.google.com/citations?user=tYNedUYAAAAJ&hl=en`
ResearcherID: `http://www.researcherid.com/rid/L-6190-2014`
MathSciNet: `https://mathscinet.ams.org/mathscinet/author?authorId=786842`

Theses:

4. *Decomposition methods and their applications in the theory of function spaces*, Habilitation Thesis, Friedrich-Schiller University, Jena, 2011.
3. *Fine properties of Sobolev embeddings*, Dissertation, 2008, Prague, (cf. the papers [2,4,6,7,8])
2. *Function Spaces with Dominating Mixed Smoothness*, Dissertation, 2005, Jena (cf. the paper [1])
1. *Optimality of Function Spaces for Boundedness of Integral Operators and Sobolev Embeddings*, Diploma Thesis, 2002, Prague.

Book chapters:

1. with H. Boche, R. Calderbank, and G. Kutyniok, *A Survey of Compressed Sensing*, First chapter in Compressed Sensing and its Applications, Birkhäuser, Springer, 2015

Refereed journal papers:

55. with C. Schneider, *Multivariate Riesz basis of ReLU neural networks*, submitted
54. with D. Krieg, *New lower bounds for the integration of periodic functions*, J. Fourier Anal. Appl. 29, 41 (2023)
53. with H. Kempka and C. Schneider, *Path regularity of Brownian motion and Brownian sheet*, to appear in Constr. Appr.
52. with A. Hinrichs, D. Krieg, and E. Novak, *Lower bounds for integration and recovery in L_2*, J. Compl (72), October 2022, 101662
51. with A. Hinrichs and J. Prochno, *Gelfand numbers of embeddings of Schatten classes*, Math. Ann. 380 (2021), 1563–1593
50. with A. Hinrichs, D. Krieg, and E. Novak, *Lower bounds for the error of quadrature formulas for Hilbert spaces*, J. Compl. (65), August 2021, 101544
49. *A variant of Schur's product theorem and its applications*, Adv. Math. 368 (2020), 107140
48. with A. Doležalová, *On the volume of unit balls of finite-dimensional Lorentz spaces*, J. Appr. Theory 255 (2020), 105407
47. with M. Ullrich, *Deterministic constructions of high-dimensional sets with small dispersion*, Algorithmica 84 (2022), 1897–1915
46. with A. Hinrichs, J. Prochno, and M. Ullrich, *The minimal k-dispersion of point sets in high-dimensions*, J. Compl. 51 (2019), 68–78
45. with M. Fornasier and I. Daubechies, *Robust and resource efficient identification of shallow neural networks by fewest samples*, Information and Inference: A journal of IMA, 10(2), June 2021, 625–695
44. with M. Kossaczká, *Entropy numbers of finite-dimensional embeddings*, Expositiones Mathematicae 38(3) (2020), 319–336
43. with H. Tyagi, *Learning non-smooth sparse additive models from point queries in high dimensions*, Constr. Appr. 50(3) (2019), 403–455
42. with M. Ullrich, *An upper bound on the minimal dispersion*, J. Compl. 45 (2018), 120–126
41. with L. M. Ghiringhelli, E. Ahmetchik, R. Ouyang, S. V. Levchenko, C. Draxl, and M. Scheffler,*Learning physical descriptors for materials science by compressed sensing*, New Journal of Physics, 19 (2017), 023017
40. with A. Hinrichs and J. Prochno, *Entropy numbers of embeddings of Schatten classes*, J. Funct. Anal. 273 (10) (2017), 3241–3261
39. with H. F. Goncalves and H. Kempka, *Franke-Jawerth embeddings for Besov and Triebel-Lizorkin spaces with variable exponents*, Ann. Acad. Sci. Fenn. Math. 43(1) (2018), 187–209
38. with T. Conrad, M. Genzel, N. Cvetkovic, N. Wulkow, A. Leichtle, G. Kutyniok, and Ch. Schuette, *Sparse Proteomics Analysis - A compressed sensing-based approach for feature selection and classification of high-dimensional proteomics mass spectrometry data*, BMC Bioinformatics 18:160 (2017)

37. with A. Hinrichs and A. Kolleck, *Carl's inequality for quasi-Banach spaces*, J. Funct. Anal. 271 (8) (2016), 2293–2307

36. with A. Kolleck, *Non-asymptotic Analysis of l_1-norm Support Vector Machines*, IEEE Trans. Inf. Theory 63, no. 9 (2017), 5461–5476

35. with H. Kempka, *Volumes of unit balls of mixed sequence spaces*, Math. Nachr. 290, no. 8-9 (2017), 1317-1327

34. with A. Kolleck, *On some aspects of approximation of ridge functions*, J. Appr. Theory 194 (2015), 35–61

33. with L. M. Ghiringhelli, S. V. Levchenko, C. Draxl, and M. Scheffler, *Big data of materials science - Critical role of the descriptor*, Phys. Rev. Lett. 114, 105503 (2015)

32. with S. Mayer and T. Ullrich, *Entropy and sampling numbers of classes of ridge functions*, Constr. Appr. 42 (2) (2015), 231-264

31. *Weak and quasi-polynomial tractability of approximation of infinitely differentiable functions*, J. Compl. 30 (2) (2014), 48–55

30. with W. Sickel and L. Skrzypczak, *Complex interpolation of weighted Besov- and Lizorkin-Triebel spaces*, Acta Math. Sin. (Engl. Ser.) 30 (8) (2014), 1297–1323

29. with W. Sickel and L. Skrzypczak, *The characterization of radial subspaces of Besov- and Lizorkin-Triebel spaces by differences*, Banach Center Publ. 102 (2014), 197–214

28. with H. Kempka, *Lorentz spaces with variable exponents*, Math. Nachr. 287, no. 8-9 (2014), 938–954

27. with C. Schneider, *Non-smooth atomic decompositions, traces on Lipschitz domains, and pointwise multipliers in function spaces*, J. Funct. Anal. 264 (5) (2013),1197–1237.

26. with C. Schneider, *Homogeneity property of Besov and Triebel-Lizorkin spaces*, J. Funct. Spaces Appl. (2012), 281085 (17 pages).

25. with M. Fornasier and J. Haškovec, *Particle systems and kinetic equations modeling interacting agents in high dimension*, SIAM: Multiscale Modeling and Simulation, 9(4)(2011), 1727–1764.

24. with H. Kempka, *Spaces of variable smoothness and integrability: Characterizations by local means and ball means of differences*, J. Fourier Anal. Appl. 18 (4) (2012), 852–891.

23. with H. Kempka, *A note on the spaces of variable integrability and summability of Almeida and Hästö*, Proc. Amer. Math. Soc. 141 (9) (2013), 3207–3212.

22. *Average best m-term approximation*, Constr. Approx. 36 (1) (2012), 83–115.

21. with M. Fornasier and K. Schnass, *Learning functions of few arbitrary linear parameters in high dimensions*, Found. Comput. Math. 12 (2) (2012), 229–262.

20. with W. Sickel and L. Skrzypczak, *On the interplay of regularity and decay in case of radial functions I. Inhomogeneous spaces*, Commun. Contemp. Math. 14 (1) (2012), 1250005 (60 pages).

19. *A variant of the Johnson-Lindenstrauss lemma for circulant matrices*, J. Funct. Anal. 260(4) (2011), 1096–1105.

18. with A. Hinrichs, *Johnson-Lindenstrauss lemma for circulant matrices*, Random Struct. Algor. 39(3) (2011), 391–398.

17. with A. Hinrichs, *On positive positive-definite functions and Bochner's Theorem*, J. Compl. 27 (2011), 264–272.

16. with S. Hencl, J. Malý and L. Pick, *Weak estimates cannot be obtained by extrapolation*, Expo. Math., 28 (2010), 375–377.

15. with C. Schneider, *On dilation operators in Triebel-Lizorkin spaces*, Funct. Approx., 41(2) (2009), 139–162.

14. *Sobolev and Jawerth embeddings for spaces with variable smoothness and integrability*, Ann. Acad. Sci. Fenn. Math. 34:2 (2009), 529–544.

13. *On sharp embeddings of Besov and Triebel-Lizorkin spaces in the subcritical case*, Proc. Amer. Math. Soc. 138 (2010), 141–146.

12. with M. Hansen, *The Jawerth-Franke embedding of spaces with dominating mixed smoothness*, Georg. Math. J. 16 (2009), No. 4, 667–682.

11. with L. Skrzypczak, *Corrigenda to the paper: "On approximation numbers of Sobolev embeddings of weighted function spaces"*, J. Approx. Theory 156 (2009), 116–119.

10. with A. Hinrichs and E. Novak, *Linear information versus function evaluations for L_2-approximation*, J. Approx. Theory 153 (2008), 97–107.

9. *Widths of embeddings in function spaces*, J. Compl. 24 (2008), 545–570.

8. *A new proof of Jawerth-Franke embedding*, Rev. Mat. Complut. 21 (2008), 75–82.

7. *Dilation operators and sampling numbers*, J. of Function Spaces and Appl. 6 (2008), 17–46.

6. *Sampling numbers and function spaces*, J. Compl. 23 (2007), 773–792.

5. with W. Sickel, *Traces of function spaces with dominating mixed derivative in* $\mathbb{R}^3$, Czechoslovak Math. J. Vol. 57, no. 4 (2007) 1239–1273.

4. *Optimal Sobolev embeddings on* $\mathbb{R}^n$, Publ. Mat. 51 (2007), 17–44.

3. *A diagonal embedding theorem for function spaces with dominating mixed smoothness*, Funct. et Appr. 33 (2005), 101–120.

2. *A remark on better-λ inequality*, Math. Ineq. and Appl. 10 (2007), 335–341.

1. *Function spaces with dominating mixed smoothness*, Diss. Math. 436 (2006), 1–73.

Papers in refereed proceedings, preprints and others:

4. with M. Fornasier and K. Schnass, *Learning functions of few arbitrary linear parameters in high dimensions*, Proceedings of SampTA 2011.

3. *Generating random signals and sparse and compressible vectors*, Proceedings of SampTA 2011.

2. with K. Schnass, *Compressed Learning of High-Dimensional Sparse Functions*, Proceedings of ICASSP 2011.

1. *Characterisations of function spaces with dominating mixed smoothness properties*, Jenaer Schriften zur Mathematik und Informatik, Math/Inf/15/03, 2003.

Recent research visits:

• February 2023, Friedrich-Schiller-University Jena, Germany
• December 2022, Friedrich-Schiller-University Jena, Germany
• November 2021, University of Novi Sad, Serbia
• April 2021, online seminar talk at Ohio State University, U.S.A.
• September 2020, online seminar talk at RWTH Aachen, Germany
• February 27-29, 2020, Simula, Oslo, Norway
• October 9-11, 2019, JKU Linz, Austria
• August 23-26, 2019, FSU Jena, Germany
• October 11-13, 2018, FSU Jena, Germany
• April 13-14, 2018, FSU Jena, Germany
• January 21-24, 2018, FHI Berlin, Germany
• June 19-22, 2017, NuHAG, University Vienna, Austria
• March 1-3, 2017, TU Munich, Germany (Prof. Massimo Fornasier)
• December 1-4, 2016, University Jena, Germany, talk on Entropy numbers of Schatten classes
• April 20-23, 2016, University Jena, Germany, talk on Carl's inequality
• February 2016, University Bonn, Germany (Dr. Tino Ullrich)
• November 2015, University Linz, Austria (Prof. Aicke Hinrichs)
• May 2015, Technical University Berlin, Germany
• November 3, 2014, Technical University Brno, Czech Republic, (Dr. Pavel Rajmic), talk on Lasso and Compressed Sensing
• September 2014, Technical University Berlin, Germany
• March 1 - March 8, 2013, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia (Dr. Jan Haškovec)
• September 22 - October 19, 2013, Institute For Pure and Applied Mathematics (IPAM), University of California, Los Angeles (UCLA).
• July 7 - 9, 2013, Universität Bonn, Germany (Dr. Tino Ullrich)
• May 28, 2013, Georg-August-Universität Göttingen, Germany (Jun.-Prof. Dr. Felix Krahmer), Colloqium Talk: *Tractable approximation of high-dimensional functions*
• February 24 - March 2, 2013, King Abdullah University of Science and Technology, Thuwal, Saudi Arabia (Dr. Jan Haškovec)

Languages:

Czech - native speaker
German - fluent
English - fluent

Referee for the following journals:

Advances in Computational Mathematics, *Algorithmica*, *Annales Polonici Mathematici*, *Annali di Matematica Pura ed Applicata*, *Applied and Computational Harmonic Analysis*, *Central European Journal of Mathematics*, *Commentationes Mathematicae Universitatis Carolinae*, *Complex Variables and Elliptic Equations*, *Discrete Mathematics*, *Eurasian Mathematical Journal*, *Foundations of Computational Mathematics*, *IEEE Signal Processing Letters*, *IEEE Transactions on Information Theory*, *IEEE Transactions on Signal Processing*, *IMA Journal of Numerical Analysis*, *Information and Inference: a journal of IMA*, *Journal of Approximation Theory*, *Journal of Complexity*, *Journal of Inequalities and Applications*, *Journal of Inequalities in Pure and Applied Mathematics*, *Journal of Fourier Analysis and Applications*, *Journal of Functional Analysis*, *Journal of Function Spaces and Applications*, *Journal of Mathematical Analysis and Applications*, *Mathematica Bohemica*, *Mathematika (Cambridge Journal)*, *Mathematische Annalen*, *Mathematische Nachrichten*, *Monatshefte für Mathematik*, *New Zealand Journal of*

Mathematics, *Numerische Mathematik*, *Proc. A Royal Soc. Edinburgh*, *Random Structures and Algorithms*, *Revista Matemática Complutense*, *Sampling Theory, Signal Processing, and Data Analysis*, *SIAM Journal of Numerical Analysis*, *Springer Science and Business Media, referee of a book proposal*, *Transactions of the American Mathematical Society*, *Zeitschrift für Analysis und ihre Anwendungen*.

Service to the community:

Since 2014: Member of the editorial board of Journal of Complexity
Member of the organization committee of Algorithms and Complexity for Continuous Problems, Dagstuhl, Germany, August 27 – September 1, 2023
Member of the organization committee of Qualitative Improvement and New Dimensions Erlebachova bouda, Czech Republic, September 13–17, 2020
Member of the organization committee of 11th International Conference Nonlinear Analysis, Function Spaces and Applications, Prague, Czech Republic, July 9–14, 2018
Member of the organization committee (together with prof. H. Boche (TU Munich), prof. R. Calderbank (Duke) and prof. G. Kutyniok (TU Berlin)) of MATHEON Workshop: "Compressed Sensing and its Applications", Berlin, December 2013.

Participation at conferences and schools:

Plenary talks:

• Foundations of Computational Mathematics
June 12 – June 21, 2023, Paris, France
Semi-plenary talk: *Lower bounds for numerical integration and approximation*

• Nonlinear Analysis, Function Spaces and Applications (NAFSA)
May 30 – June 3, 2022, Praha, Czech Republic
talk: *Regularity of paths of the Wiener process and of the Brownian sheet*

• Lubos Pick turns 60
September 15 – 19, 2021, Zelezna Ruda, Czech Republic
talk: *Sure you know Schur*

• Summer School, Joint PhD Programm of universities in Aveiro, Coimbra, Minho and Porto, September 9-13, 2019, Braga, Portugal
talk: *Morrey-Besov spaces, heat equations and Navier-Stokes equation*

• Analysis Seminar 2018, June 8 – 10, 2018, Traunkirchen, Austria
talk: *Approximation of structured functions and simple neural networks*

• Approximating high dimensional functions, December 18 – 19, 2017, Turing Institute, London, UK
talk: *Ridge functions, their sums, and sparse additive functions*

• NOMAD Summer, September 25 – 29, 2017, Berlin, Germany
talk: *Compressed Sensing and Neural Networks*

• New perspectives in the theory of function spaces and their applications, September 18 – 22, 2017, Bedlewo, Poland
talk: *From approximation theory to machine learning*

• WDI^2 - Approximation Theory and Applications, March 10, 2017, Innsbruck, Austria
talk: *Optimality and lower bounds in approximation theory*

• Perspectives in High-dimensional Probability and Convexity, February 6-10, 2017, Oberwolfach, Germany
talk: *IBC: Approximation problems and lower bounds*

• Facets of Complexity, September 29 - September 30, 2016, FU Berlin, Germany
talk: *Information Based Complexity*

• Function Spaces, Differential Operators and Nonlinear Analysis (FSDONA) 2016, July 4 - 9, Prague, Czech Republic
talk: *What is Information Based Complexity?*

• Summer School on Applied Analysis, September 21 - 25, 2015, TU Chemnitz, Germany
3 talks on *Low-rank matrix recovery*

• Information-based complexity, Banach Center Conferences, April 26 - May 2, 2015, Bedlewo, Poland
Plenary talk: *Ridge functions: approximation, tractability, and applications*

• Seminar and winter school of numeric analysis, Ostrava, Czech Republic, January 19 - 23, 2015
3 talks on *LASSO and Compressed Sensing in analysis of high-dimensional data*

• Innovative Verarbeitung bioelektrischer und biomagnetischer Signale
TU Berlin, Germany; April 10 - 11, 2014
Plenary talk: *Compressed Sensing*

• 3rd SPLab Workshop 2013, Brno, Czech Republic; October 30 - November 1, 2013
Plenary talk: *Survey on Compressed Sensing and Applications*

• Function Spaces, Differential Operators, Nonlinear Analysis (FSDONA-2011)
Tabarz, Germany; September 18 - 24, 2011
Semi-plenary talk: *Besov and Triebel-Lizorkin spaces of variable smoothness and integrability*

• Workshop "Smoothness, Approximation, and Function Spaces"
Oppurg, Germany; October 10 - 16, 2010
Semi-plenary talk: *Average best m-term approximation*

Selected short talks (since 2014):

• Workshop on Mathematical Information Science
The Lagrange Mathematics and Computation Research Center, October 9-13, 2023, Paris
Talk: Multivariate Riesz basis of ReLU neural networks

• ICIAM 2023 (10th International Congress on Industrial and Applied Mathematics)
Waseda University, Tokyo, Japan; August 20-25, 2023
Talk: Multivariate Riesz basis of ReLU neural networks

• Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing
Linz, Austria; July 17-22, 2022
Talk: Schur's multiplication theorem and lower bounds for numerical integration

• School and conference "Sampling recovery and related problems"
Moscow, Russia (online event), May 3–7, 2021
Talk: Robust and efficient identification of neural networks

• Qualitative Improvement and New Dimensions
Erlebachova bouda, Czech Republic; September 13-17, 2020
Talk: A variant of Schur's product theorem and its applications

• Analysis und Theoretische Numerik
Siegmundsburg, Germany; July 27-29, 2020
Poster: A variant of Schur's product theorem and its applications

• New Perspectives and Computational Challenges in High Dimensions
Oberwolfach, Germany; February 3-7, 2020
talk: *Numerical integration and Schur's product theorem*

• Analysis und Theoretische Numerik
Siegmundsburg, Germany; August 26-28, 2019
Talk: On the volume of (non-)convex bodies

• Algorithms and Complexity for Continuous Problems
Dagstuhl, Germany; August 18–23, 2019
Talk: Approximation of shallow neural networks

• 10th Function Spaces, Differential Operators and Nonlinear Analysis (FSDONA2019)
Turku, Finland; June 12-15, 2019
Talk: Approximation of multivariate functions

• Challenges in optimal recovery and hyperbolic cross approximation, Isaac Newton Institute for Mathematical Sciences
Cambridge, UK; February 18 - 22, 2019
Talk: *Approximation of Ridge Functions and Sparse Additive Models*

• Discrepancy, RICAM Special Semester on Multivariate Algorithms and their Foundations in Number Theory
Linz, Austria; November 26 - 30, 2018
Talk: *Volumes of (non-)convex bodies in* $\mathbb{R}^n$

• Nonlinear Analysis, Function Spaces and Applications (NAFSA)
Prague, Czech Republic; July 9 - 14, 2018
Talk: *On a notion of minimal dispersion*

• Monte Carlo & Quasi-Monte Carlo Methods in Scientific Computing (MCQMC)
Rennes, France; July 1 - 6, 2018
Talk: *On further aspects of dispersion*

• Strobl18, "Harmonic Analysis and Applications"
Strobl, Austria; June 4 - 8, 2018
Talk: *Carl's inequality and entropy numbers of Schatten classes*

• Foundations of Computational Mathematics, FoCM 2017
July 10 - 19, 2017 – Barcelona, Spain
Talk: *Optimality and lower bounds in approximation theory*

• 7th Workshop on High-Dimensional Approximation
February 13 - 17, 2017 – The University of New South Wales, Sydney, Australia
Talk: *Carl's inequality and entropy numbers of Schatten classes*

• IBC on the 70 th anniversary of Henryk Woźniakowski
Bedlewo, Poland; August 28 - September 2, 2016
Talk: *Carl's inequality for quasi-Banach spaces*

• Strobl16, "Time-Frequency Analysis and Related Topics"
Strobl, Austria; June 6 - 10, 2016
Talk: *Carl's inequality for quasi-Banach spaces*

• Hausdorff trimester "Mathematics of Signal Processing", Workshop on Low Complexity Models
Bonn, Germany; February 15 - 19, 2016
Talk: *Non-asymptotic analysis of ℓ_1-support vector machines*

• Workshop "Big Data of Materials Science - Critical Next Steps"
CECAM (Centre Européen de Calcul Atomique et Moléculaire)
Lausanne, Switzerland; November 30 - December 4, 2015
Talk: *Interpretability of machine learning: search for human-readable descriptors*

• SIAM Conference on Applied Linear Algebra, Atlanta, U.S.A., October 26 - 30, 2015
Talk: *Approximation of ridge functions*

• Applied Harmonic Analysis and Sparse Representations, Oberwolfach, August 17 - 21, 2015
Talk: *Non-assymptotic analysis of ℓ_1-SVM*

• Workshop on Function Spaces and Approximation, Siegmundsburg, Germany, July 21 - 24, 2015
Talk: *Non-assymptotic analysis of ℓ_1-SVM*

• IMACS Seminar on Monte Carlo Methods (MCM 2015), Linz, Austria, July 6 - 10, 2015
Talk: *Non-assymptotic analysis of ℓ_1-SVM*

• Approximation Methods and Function Spaces, Hasenwinkel, Germany, March 16 - 20, 2015
Talk: *On Lorentz spaces with variable exponents*

• Foundations of Computational Mathematics, Montevideo, Uruguay, December 11 - 20, 2014
Talk: *Tractability of approximation of ridge functions*

• White nights of materials science: From physics and chemistry to data analysis, and back
Saint Petersburg, Russia, June 16 - 20, 2014
Talk: *Sparsity and Kernel Methods in Machine Learning*

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