

## Curriculum Vitae

**Kateryna Pozharska** (Shvai)

### Personal

Date of birth – 04.03. 1994  
Nationality – Ukrainian  
Marital status – married, 1 child (2022)



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### Address

Theory of Functions Department  
Institute of Mathematics  
National Academy of Sciences of Ukraine  
Tereshchenkivska Str. 3, 01024 Kyiv-4, Ukraine  
  
Faculty of Mathematics  
Chemnitz University of Technology  
Reichenhainer Str. 39, 09107 Chemnitz, Germany

### Research interests

Approximation Theory, Information Based Complexity,  
Theory of Function Spaces, Nonlinear Approximation,  
Sampling Recovery, Data Sparsification, Discretization,  
Frame Theory

### Languages

Ukrainian (native), Russian (fluent), English (fluent),  
German (Telc B2)

**PhD thesis**      “Best approximations and entropy numbers of the classes of periodic multivariate functions”  
speciality – 01.01.01 Mathematical analysis  
supervisor – Prof. Dr. Romanyuk A.S.  
Diploma issued on 05.03.2019

## **Education**

2015–2018      PhD, Institute of Mathematics of the NAS of Ukraine,  
Theory of Functions Department, Kyiv, Ukraine

2014–2015      Master’s degree, Lesya Ukrainka Eastern European  
National University, Faculty of Mathematics, Lutsk,  
Ukraine (speciality “Mathematics”, master’s degree  
with honours)

2010–2014      Bachelor’s degree, Lesya Ukrainka Eastern European  
National University, Faculty of Mathematics, Lutsk,  
Ukraine (speciality “Mathematics”, bachelor’s degree  
with honours)

## **Working experience**

03.2025–present      Postdoctoral researcher, Group of Prof. Dr. Tino Ullrich.  
Within the DFG project № 403/4-1.  
Chemnitz University of Technology, Germany.

12.2021–present      Researcher, Group of Prof. Dr. Anatolii Romanyuk.  
Institute of Mathematics of the NAS of Ukraine.

09.2022–02.2025      Postdoctoral researcher, Group of Prof. Dr. Tino Ullrich.  
Within the scholarship from the Philipp Schwartz  
Initiative of the Alexander von Humboldt Foundation.  
Chemnitz University of Technology, Germany.

10.2020–01.2022      Senior Lecturer, Department of Mathematical Analysis  
and Statistics, Faculty of Information Technology and  
Mathematics, Lesya Ukrainka Volyn National University.

09.2019–01.2020      Invited researcher, Group of Prof. Dr. Tino Ullrich.  
Chemnitz University of Technology, Germany.

11.2018–12.2021      Junior researcher, Group of Prof. Dr. Anatolii Romanyuk.  
Institute of Mathematics of the NAS of Ukraine.

09.2017–12.2019 Junior researcher, Ukrainian State Budget Theme  
“Extremal Problems of Approximation Theory in Functional Spaces”

## Scholarships and awards

2025	Grant of the National Academy of Sciences of Ukraine for research groups of young scientists of NAS of Ukraine
2024	<b>Award of the Supreme Council of Ukraine for young scientists</b>
2024	The Best Talk Award at the Conference of young scientists “Pidstryhach readings – 2024”, Lviv, Ukraine
2023	“Young researcher of the year” Award in the nomination “Scientific cooperation” (all-Ukrainian competition)
2023	“Talent, inspiration, work” Award of the National Academy of Sciences of Ukraine
2023	<b>Joseph F. Traub Information-Based Complexity Young Researcher Award</b>
2022	<b>Scholarship of the Philipp Schwartz Initiative of the Alexander von Humboldt Foundation</b>
2021	<b>Award of the President of Ukraine for young scientists</b>
2020	Scholarship of the National Academy of Sciences of Ukraine for young scientists
2020	Grant of the National Academy of Sciences of Ukraine for research groups of young scientists of NAS of Ukraine
2011–2015	During the university studies: the scholarships - of the President of Ukraine, - of the Supreme Council of Ukraine, - of the Fund “Only Together” by Igor Palytsia, - Myhaylo Kravchuk scholarship for talented students; - a winner of the All-Ukrainian Competition-Defence of Students Research Works (twice: Vinnytsia, Ivano-Frankivsk); - 3rd place in the All-Ukrainian Students Olimpiad in mathematics (twice, Lviv)

## Other contributions

2023                      Established the ERASMUS+ partnership for student's exchange between Chemnitz University of Technology and Lesya Ukrainka Volyn National University (for academic years 2023/2024 – 2024–2026).

## Membership in associations

2025–present            Member of the Society for Industrial and Applied Mathematics (SIAM).  
2024–present            Member of the European Mathematical Society.  
2024–present            Member of the European Women in Mathematics Association.  
2024–present            Member of the Association for Women in Mathematics.  
2019–present            Member of the Marie Curie Alumni Association.  
10.2019–09.2022        Member of the Council of Young Scientists, Institute of Mathematics of the NAS of Ukraine.  
12.2019–10.2021        Member of the Council of Young Scientists, Lesya Ukrainka Volyn National University.

## Short research visits

15-19.06.2024            Technical University of Munich. Research with Dr. Frank Filbir (by invitation).  
23.03.19-24.04.19        Institute of Mathematics, University of Lübeck, Germany. Visit in the framework of H2020-MSCA-RISE-2014 Project number 645672 (AMMODIT). Research with Prof. Dr. Juergen Prestin.  
13.11.18-20.12.18        Institute of Mathematics, University of Lübeck, Germany. Visit in the framework of H2020-MSCA-RISE-2014 Project number 645672 (AMMODIT). Research with Prof. Dr. Juergen Prestin.  
01.08.18-31.08.18        Johann Radon Institute for Computational and Applied Mathematics (RICAM), Austrian Academy of Sciences, Austria. Visit in the framework of H2020-MSCA-RISE-2014 Project number 645672 (AMMODIT). Research with Prof. Dr. Sergei Pereverzyev.

## Managerial activities

- 18.08.24-23.08.24 Organizer of two Special Sessions “Function recovery and discretization problems” in the 16th International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing, University of Waterloo, Canada
- 06.06.22-10.06.22 International Conference “Theory of Approximation of Functions and its Applications”, dedicated to the 80th anniversary of the Corresponding Member of the NAS of Ukraine, Prof. A. Stepanets (1942-2007), Lutsk, Ukraine (Scientific Secretary)
- 03.06.21-05.06.21 International Conference of Young Mathematicians, Kyiv, Ukraine (Member of the Program Committee)
- 20.06.19-26.06.19 International Conference “Functional Methods in Approximation Theory, Differential Equations and Numerical Mathematics IV” dedicated to the 100th anniversary of V. K. Dzyadyk (1919-1998), Svityaz', Volyn region, Ukraine (Scientific Secretary)
- 06.06.19-08.06.19 International Conference of Young Mathematicians, Kyiv, Ukraine (Member of the Organizing Committee)
- 18.03.19-22.03.19 Final AMMODIT Conference “Mathematics for life sciences”, Kyiv, Ukraine (Member of the Local Organizing Committee)
- 02.09.18-04.09.18 Coordination meeting of the planned project “Spectral optimization: From Mathematics to Engineering and Life Sciences” (SOMELS), Kyiv, Ukraine (Member of the Local Organizing Committee)
- 07.06.17-10.06.17 International Conference of Young Mathematicians in honor of the 100th anniversary of Academician of NASU, Prof. Yu. O. Mitropolskiy, Kyiv, Ukraine (Member of the Local Organizing Committee)

## List of publications

- 2026 (1) D. Krieg, K. Pozharska, M. Ullrich, T. Ullrich, *Sampling projections in the uniform norm*. J. Math. Anal. Appl. 551, No. 2, 129873 (2026). (arXiv: 2401.02220)
- 2025 (2) M. Moeller, K. Pozharska, T. Ullrich, *Instance optimal function recovery – samples, decoders and asymptotic performance*. arXiv:2503.16209.
- (3) D. Krieg, K. Pozharska, M. Ullrich, T. Ullrich, *Sampling recovery in  $L_2$  and other norms*. arXiv: 2305.07539. (Under final revision in Math. Comp.)
- (4) M. Moeller, K. Pozharska, T. Ullrich, *Sampling designs for function recovery – theoretical guarantees, comparison and optimality*. MCQMC24 Proceedings, in print.
- 2024 (5) F. Bartel, L. Kämmerer, K. Pozharska, M. Schäfer, T. Ullrich, *Exact discretization, tight frames and recovery via  $D$ -optimal designs*. arXiv:2412.02489. (Under revision in SMAI J. Comp. Math.)
- (6) K. Pozharska, A. Romanyuk, *The best  $m$ -term trigonometric approximations of the classes of periodic functions of one and many variables in the space  $B_{q,1}$* , Res. Math. 32, No. 2 (2024).
- (7) K.V. Pozharska, A.S. Romanyuk, V.S. Romanyuk, *Widths and entropy numbers of the classes of periodic functions of one and several variables in the space  $B_{q,1}$* , Carpathian Math. Publ. 16, No. 2, 351-366 (2024).
- (8) K.V. Pozharska, A.S. Romanyuk, S.Ya. Yanchenko, *Best approximations for classes of periodic functions of many variables with bounded dominating mixed derivative*, Ukr. Math. J. 76, No. 7, 1007-1023 (2024).
- (9) K.V. Pozharska, A.S. Romanyuk, *Estimates for the approximation characteristics of the Nikol'skii-Besov classes of functions with mixed smoothness in the space  $B_{q,1}$* . arXiv: 2404.05451. (Under final revision in Math. Nachr.)
- 2023 (10) A. Romanyuk, V. Romanyuk, K. Pozharska, S. Hembars'ka, *Characteristics of linear and nonlinear approximation of isotropic classes of periodic multivariate func-*

- tions, Carpathian Math. Publ. 15, No. 1, 78-94 (2023).
- 2022 (11) K. Pozharska, T. Ullrich, *A note on sampling recovery of multivariate functions in the uniform norm*, SIAM J. Numer. Anal. 60, No. 3, 1363–1384 (2022).
- (12) O. Shvai, K. Pozharska, *On some approximation properties of Gauss-Weierstrass singular operators*, J. Math. Sci. 260, No. 5, 693–699 (2022).
- 2021 (13) A. A. Pozharskyi, K. V. Pozharska, *Recovery of continuous functions of two variables from their Fourier coefficients known with error*, Carpathian Math. Publ. 13, No. 3, 676–686 (2021).
- 2020 (14) K. V. Pozharska, A. A. Pozharskyi, *Recovery of continuous functions from their Fourier coefficients known with error*, Res. Math. 28, No. 2, 24–34 (2020).
- (15) I. V. Kal'chuk, YU. I. Kharkevych, K. V. Pozharska, *Asymptotics of approximation of functions by conjugate Poisson integrals*, Carpathian Math. Publ. 12, No. 1, 138–147 (2020).
- 2019 (16) K. V. Pozharska, *Entropy numbers of the Nikil'skii – Besov-type classes of periodic functions of many variables*, J. of Math. Sci. 241, No. 1, 64–76 (2019).
- (17) K. V. Pozharska, *Estimates for the entropy numbers of the classes  $B_{p,\theta}^\Omega$  of periodic multivariable functions in the uniform metric*, Ukr. Math. J. 70, No. 9, 1439-1455 (2019).
- 2018 (18) K. V. Shvai, *Estimation of the best bilinear approximations for the classes of  $(\psi, \beta)$ -differentiable periodic multivariable functions*, Ukr. Math. J. 70, No. 4, 649–660 (2018).
- (19) Yu. I. Kharkevych, K. V. Pozharska, *Asymptotics of approximation of conjugate functions by Poisson integrals*, Acta et Commentationes Universitatis Tartuensis de Mathematica. 22, No. 2, 235-243 (2018).
- 2017 (20) K. V. Pozharska, *Estimates of the best  $M$ -term trigonometric approximations of the classes  $L_{\beta,p}^\psi$  of periodic multivariate functions of small smoothness in the space  $L_q$* ,

Differential equations and related questions of analysis:  
Zb. Pr. Inst. Mat. NAN Ukr. 14, No. 3, 293-318  
(2017). (in Ukrainian)

- (21) K. V. Shvai, *The best  $M$ -term trigonometric approximations of the classes of periodic multivariate functions with bounded generalized derivative in the space  $L_q$* , J. Math. Sci. 222, No. 6, 750–761 (2017).
- 2016 (22) K. V. Shvai, *The best  $M$ -term trigonometric approximations of classes of  $(\psi, \beta)$ -differentiable periodic multivariate functions in the space  $L_q$* , J. Num. and Appl. Math. 122, No. 2, 83–91 (2016).
- (23) K. V. Shvai, *Estimates of the best orthogonal trigonometric approximations of the generalized multivariate analogues of Bernoulli kernels and classes  $L_{\beta,1}^\psi$  in the space  $L_q$* , Differential equations and related questions of analysis: Zb. Pr. Inst. Mat. NAN Ukr. 13, No. 1, 300–320 (2016). (in Ukrainian)

## Learning materials

O. L. Shvai, K. V. Pozharska, Methodical recommendations for solving the problems on the discipline  
“Computer discrete mathematics”, Lutsk, Lesya Ukrainka Volyn National University, 2020, 65 pp.

O. L. Shvai, K. V. Pozharska, Lecture notes on the discipline “Computer discrete mathematics”, Lutsk, Lesya Ukrainka Volyn National University, 2020, 55 pp.

O. L. Shvai, K. V. Pozharska, Collection of tests on the discipline “Computer discrete mathematics”, Lutsk, Lesya Ukrainka Volyn National University, 2020, 52 pp.

## Articles in the “Encyclopedia of Modern Ukraine”

2020 “Approximation theory”  
[http://esu.com.ua/search\\_articles.php?id=71385](http://esu.com.ua/search_articles.php?id=71385)

2021 “Inequality”  
[https://esu.com.ua/search\\_articles.php?id=74501](https://esu.com.ua/search_articles.php?id=74501)



## Conferences and workshops

- 09.06.25-11.06.25 Workshop: Approximation and learning in high dimensions, CRM, Université de Montréal, Montreal, Canada
- 02.06.25-06.06.25 Conference on Modern trends in Fourier analysis, CRM, Barcelona, Spain
- 26.05.25-30.05.25 Advanced Course on Modern aspects of Fourier analysis, CRM, Barcelona, Spain
- 19.05.25-22.05.25 Constructive Functions 2025 in conjunction with the 37th Shanks Lecture Celebrating Ed Saff's 80th birthday, Vanderbilt University, Nashville, Tennessee, U.S.A.
- 12.05.25-16.05.25 Workshop within the framework of the HORIZON-2020 project SOMPATY-2025 (online, **invited speaker**)
- 12.05.25 **EWM May12 event. Celebrating Women in Mathematics** (online)
- 03.04.25-04.04.25 Workshop on Approximation Theory and Fast Algorithms dedicated to the 65th birthday of Prof. Dr. Jürgen Prestin and the 70th birthday of Prof. Dr. Winfried Sickel, Hasenwinkel, Germany (**Plenary speaker**)
- 03.04.25-04.04.25 **Philipp Schwartz Forum, Berlin, Germany** (Poster)
- 21.03.25-22.03.25 **Marie Curie Alumni Association (MCAA) Annual Conference and General Assembly**, Krakow, Poland (Lightning talk)
- 03.03.25-07.03.25 SIAM Conference on Computational Science and Engineering (CSE25), Fort Worth, Texas, U.S.A. (**Invited speaker** at the Special Session)
- 17.01.25-18.01.25 34. Rhein-Ruhr-Workshop über Angewandte Mathematik, Approximationstheorie und Numerische Mathematik, Bestwig (Sauerland), Germany
- 10.09.24-13.09.24 6th Workshop on Sparse Grids and Applications, Bonn, Germany (**Plenary Speaker**)
- 18.08.24-23.08.24 16th International Conference on Monte Carlo and Quasi-Monte Carlo Methods in Scientific Computing, University of Waterloo, Canada (Co-organizer of two Special Sessions, **Invited speaker** at the Special Session)

29.07.24-02.08.24	2nd Analysis Mathematica Conference, Budapest, Hungary
23.07.24-25.07.24	Siegmundsburg Workshop, Germany
26.06.24-28.06.24	10th International Conference on Mathematical Methods for Curves and Surfaces, Oslo, Norway
09.06.24-15.06.24	More on Harmonic Analysis, Strobl, Austria
27.05.24-29.05.24	The conference of young scientists “Pidstryhach readings – 2024”, Lviv, Ukraine (online)
18.09.23-22.09.23	Workshop and Summer School on Applied Analysis 2023, Chemnitz, Germany
02.09.23-06.09.23	Workshop “From Modeling and Analysis to Approximation and Fast Algorithms”, Hasenwinkel, Germany
27.08.23-01.09.23	Dagstuhl-Seminar 23351 “Algorithms and Complexity for Continuous Problems”, Schloss Dagstuhl, Leibniz-Zentrum für Informatik, Germany ( <b>by invitation only</b> )
19.06.23-21.06.23	Foundations of Computational Mathematics (FoCM) 2023, Paris, France
01.06.23-03.06.23	International Conference of Young Mathematicians, Kyiv, Ukraine (online)
21.06.21-25.06.21	9th International Online Conference on “Mathematical Analysis, Differential Equation & Applications MADEA 9”, Bishkek, Kyrgyz Republic
16.06.21-18.06.21	Contemporary Analysis and Its Applications. Satellite event of the 8th European Congress of Mathematics, Portorož, Slovenia (online)
03.06.21-05.06.21	International Conference of Young Mathematicians, Kyiv, Ukraine (online)
26.05.21-28.05.21	Conference of Young Scientists “Pidstryhach readings – 2021”, Lviv, Ukraine (online)
12.05.21-13.05.21	International research and practice conference of post-graduate students and students “Young science of Ukraine: priorities and perspectives of research”, Lutsk, Ukraine
19.03.21-21.03.21	International Online Workshop on Approximation Theory, Ivano-Frankivsk, Ukraine

01.12.20-03.12.20	3rd BYMAT Conference, Valencia, Spain
26.10.20-30.10.20	11th International Skorobohatko Mathematical Conference, Lviv, Ukraine
16.09.20-19.09.20	International conference dedicated to the 100th anniversary of M. P. Korneichuk (1920-2003), Dnipro, Ukraine
26.05.20-28.05.20	Conference of Young Scientists “Pidstryhach Readings – 2020”, Lviv, Ukraine
21.05.20-22.05.20	International research and practice conference of young scholars, postgraduates and bachelor students “Challenges and opportunities of modern science”, Rivne, Ukraine
04.03.20-08.03.20	Workshop “Analytical Modeling and Approximation Methods” , A meeting within the VolkswagenStiftung project “From Modeling and Analysis to Approximation”, Berlin, Germany
23.09.19-27.09.19	Chemnitz Summer School on Applied Analysis 2019 Faculty of Mathematics of the Chemnitz University of Technology, Germany
20.06.19-26.06.19	International Conference “Functional Methods in Approximation Theory, Differential Equations and Numerical Mathematics IV” dedicated to the 100th anniversary of V. K. Dzyadyk (1919–1998), Svityaz', Ukraine
06.06.19-08.06.19	International Conference of Young Mathematicians, Kyiv, Ukraine
18.03.19-22.03.19	Final AMMODIT Conference “Mathematics for life sciences”, Kyiv, Ukraine
17.09.18-19.09.18	International Scientific Conference “Modern problems of mathematics and its application in natural sciences and information technologies” in honor of the 50th anniversary of the Faculty of Mathematics and Informatics, Chernivtsi, Ukraine
22.05.18-25.05.18	International Conference “Modern Problems of Mechanics and Mathematics” dedicated to 90th anniversary of Ya. S. Pidstryhach, Academician of NASU and 40th

- anniversary of the Institute for Applied Problems of Mechanics and Mathematics of NASU, Lviv, Ukraine
- 19.03.18-23.03.18 4th AMMODIT Conference, Malekhiv (Lviv region), Ukraine
- 07.06.17-10.06.17 International Conference of Young Mathematicians in honor of the 100th anniversary of Academician of NASU, Prof. Yu. O. Mitropolskiy, Kyiv, Ukraine
- 28.05.17-03.06.17 International Conference “Theory of approximation of functions and its applications” in honor of the 75th anniversary of Alexander Stepanets, Doctor of Sciences, Professor, Corresponding Member of NASU, Slovyansk, Ukraine
- 23.05.17-25.05.17 Conference of Young Scientists “Pidstryhach Readings – 2017”, Lviv, Ukraine
- 22.02.17-25.02.17 All-Ukrainian Scientific Conference “Modern problems of probability theory and mathematical analysis”, Vorokhta, Ukraine
- 26.01.17-30.01.17 3rd Conference “Approximation Methods for Molecular Modelling and Diagnosis Tools” (AMMODIT), Kyiv, Ukraine
- 01.08.16-14.08.16 XI Summer School “Algebra, Topology, Analysis”, Odessa, Ukraine
- 25.05.16-27.05.16 Conference of Young Scientists “Pidstryhach Readings – 2016”, Lviv, Ukraine

## Seminar talks

- 21.06.2024 Research Seminar Function Spaces, Faculty of Mathematics and Computer Science, University of Jena, Germany
- 08.01.2024 Joint seminar of the Technical University of Munich and the Helmholtz Center Munich, Germany
- 10.10.2023 Research seminar Applied Analysis, Institute of Mathematics, Osnabrück University, Germany
- 09.08.2023 Faculty of Mathematics, Chemnitz University of Technology, Germany

29.09.2021	Point Distributions Webinar, online
09.09.2021	Seminar within the EU Project SOMPATY (“Spectral Optimization: From Mathematics to Physics and Advanced Technology”), online
13.05.2021	Oles Honchar Dnipro National University, Ukraine
04.03.2020	Faculty of Mathematics, Chemnitz University of Technology, Germany
28.05.2019	Faculty of Mathematics, Chemnitz University of Technology, Germany
28.11.2018	Institute of Mathematics, University of Lübeck, Germany
27.09.2018	Taras Shevchenko National University of Kyiv, Ukraine
–	Institute of Mathematics of NAS of Ukraine, Ukraine

### **Selected interviews and references**

Interview for TSN 1+1 (main Ukrainian daily news TV program)

News on the Ukrainian Mathematical Community webpage

News in the Notices of the American Mathematical Society

News on the Chemnitz University of Technology webpage

Interview for MAN Platform (Junior Academy of Sciences of Ukraine)

Interview for Lesya Ukrainka National University

Interview for MAN Platform (Junior Academy of Sciences of Ukraine)