CURRICULUM VITAE

TETIANA STEPANIUK (STEPANYUK)

Date and place of birth: January 21, 1989; Lutsk, Ukraine
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ACADEMIC DEGREES

Ph.D. in Physical and Mathematical Sciences (Mathematical Analysis), Institute of Mathematics of NAS of Ukraine, Kyiv, Ukraine, 2016.
Title: *"Approximation characteristics of classes of (ψ,β)-differentiable functions"*.

CURRENT INSTITUTIONAL AFFILIATION:

University of Lübeck, Alexander von Humboldt postdoctoral fellow.

EDUCATION

Jan-Feb 2020	intensive German course at did deutsch-institut Hamburg;
Nov. 2012 – Nov. 2015	**PhD student** in Mathematical Analysis of Lesya Ukrainka EENU Ph.D. supervisor: Anatoly Serdyuk (Defense of PhD thesis took place in Institute of Mathematics of NAS of Ukraine on 19th of January, 2016);
2011	**Master degree** in Mathematics with honors of Lesya Ukrainka EENU;
2006 – 2010	**Bachelor degree** in Mathematics with honors of Lesya Ukrainka VNU.

PROFESSIONAL EXPERIENCE

Since March 2020	**Humboldt Fellow** at Institute of Mathematics, University of Lübeck;
Jan. 2019 – Dec. 2019	**Postdoctoral researcher** at Johann Radon Institute of Computational and Applied Mathematics (RICAM) Austrian Academy of Sciences, Linz, within the Special Research Program (SFB) "Multivariate Algorithms and Quasi-Monte Carlo Methods" under the supervision of Peter Kritzer (FWF project F5506-N26);
Aug. 2018 – present	**Researcher (part time)** at Institute of Mathematics of National Academy of Sciences of Ukraine;
Jan. 2017 – Dec. 2018	**Postdoctoral researcher** at Graz University of Technology, Graz, within the Special Research Program (SFB) "Quasi-Monte Carlo Methods: Theory and Applications" under the supervision of Peter Grabner (FWF project F5503);
Sept 2016 – Aug. 2017	**Assistant Professor** of Department of differential equations and Mathematical Physics of Lesya Ukrainka EENU;
Nov. 2015 – Aug. 2016	**Senior Lecturer** of Department of Differential equations and Mathematical Physics of Lesya Ukrainka EENU;
Sept. 2011 – Jan. 2013	**Assistant and Senior Lecturer** of Department of Mathematical Analysis of Lesya Ukrainka Eastern European National University;
September 2010	internship in Lutsk City council.

SCHOLARSHIPS, GRANTS AND AWARDS

2021	President's award for young scientists of Ukraine http://www.kdpu-nt.gov.ua/en/node/313593;
2020	Humboldt Fellowship for postdoctoral researchers (Host Prof Jürgen Prestin) University of Lubeck, Germany; Fellowship is granted for 24 months;

2018-2019	grant of NAS of Ukraine for groups of young scientists (project No16-10/2018);
2016	travel grant to attend the 7th European Congress of Mathematics (Berlin, July 18-22);
2010, 2011	scholar twice of the scholarship program of Victor Pinchuk Foundation Zavtra.UA for talented students; http://www.zavtra.in.ua/;
Jan. 2010	first award "Student year 2009 of Volyn" in nomination "scientist of natural sciences".

LANGUAGE PROFICIENCY AND TECHNICAL SKILLS

Languages: Ukrainian (Native speaker),
Russian (Native speaker),
English (Fluent)
German (Fluent, Goethe Zertifikat C1),
Spanish (Intermediate, approx. A2-B1)

Programming languages: Python, Java, JavaScript, C++, Delphi, Pascal

Technical skills: React.js; Mathematica.app;
Coursera certificate in Cryptography I coursera.org/verify/MNFFW5VK4XLN
Crash Course on Python coursera.org/verify/9S8TA7WE73YS

Reviewer for: Journal of Complexity ; Springer Proceedings in Mathematics & Statistics; Mathematics; Computational Methods in Applied Mathematics; Math Reviews

Co-organizer of Point Distributions Webinar https://www.math.fsu.edu/~vlasiuk/point_seminar.html

RESEARCH INTERESTS

Interested in Approximation Theory, Numerical Analysis, Programming, Quasi-Monte Carlo, Data Science, Machine Learning, Information-Based Complexity and related fields.

KEY WORDS: best approximations, Fourier sums, linear methods of approximation, Lebesgue inequalities, interpolation, wavelets, shearlets, worst-case error, discrete energies, spherical t-designs, Quasi-Monte Carlo (QMC) methods, points configurations on the manifold, tractability problems, construction of polynomial lattice rules, Information-Based Complexity.

RESEARCH STAYS/VISITS

Nov. 11-16, 2018	Universidad de Cantabria, Santader, Spain (invited by Carlos Beltran)
Sept. 29 – Oct.26, 2018	Vanderbilt University, USA (invited by Edward Saff)
May 29 -June 1, 2018	University of Lübeck, Germany (invited by Jürgen Prestin) Colloquium talk
Feb. 25- March 25, 2018	ICERM Semester Program on "Point Configurations in Geometry, Physics and Computer Science", ICERM, Brown University, USA:
Sept. 11 – Oct. 13, 2017	Program on “Tractability of High Dimensional Problems and Discrepancy”, ESI, University of Vienna;

TEACHING

Winter Semester 2021-2022 **University of Lübeck** (Lübeck, Germany)
Analysis I: exercise classes (in German)

Summer Semester 2021-2022 **University of Lübeck** (Lübeck, Germany
Analysis I: exercise classes (in German)

2015-2016 **Lesya Ukrainka Eastern European National University** (Lutsk, Ukraine)
Differential equations: lectures, exercise classes and exams,
Probability Theory: lectures, exercise classes and exams,

Statistics: lectures, exercise classes and exams,
Special courses.

2011-2012 **Lesya Ukrainka Eastern European National University** (Lutsk, Ukraine)
Numerical methods: lectures, exercise classes and exams,
Mathematical Analysis: exercise classes,
Probability Theory: exercise classes,
Statistics: exercise classes.

SELECTED CONFERENCE TALKS

- Online Hypercomplex Seminar 2021 "(Hyper)Complex Seminar"; Bedlewo (Poland), November 11-14, 2021;
- Online International Conference on Computational Harmonic Analysis, September 13-17, 2021, Munich
- Online Seminar “From Modeling Analysis to Approximation”, University of Lübeck, Germany, April 23, 2021
- Online Seminar of Department of Mathematics and Mechanics of Oles Honchar Dnipropetrovsk University, Ukraine, April 1, 2021
- Seminar for young scientists at Institute of Mathematics of NAS of Ukraine, online talk, February 5, 2021
- Combinatorial and geometrical discrepance workshop September 30 – October 2, 2020, Bannf, Canada, online talk
- 11th International Skorobahat’ko Conference, Lviv, October 26- 30, 2020, Online talk
- Point Distributions Webinar, 29th of July, 2020 online talk
- Workshop "Analytical Modeling and Approximation Methods" A meeting within the VolkswagenStiftung project "From Modeling and Analysis to Approximation" Berlin, Germany, March 4-8, 2020;
- Workshop Algorithms & Complexity in High Dimensions, September 30-October 4, 2019, Graz, Austria
- 8th Workshop on High-Dimensional Approximation, September 9-13, 2019, ETH, Zurich, Switzerland
- The 15th International Symposium on Orthogonal Polynomials, Special Functions and Applications (OPSFA) 22-25 July, 2019 Hagenberg, Austria.
- International Congress on industrial and applied Mathematics, July 15-19, 2019, Valencia, Spain
- The 12th International Conference on Monte Carlo Methods and Applications, July 8-12, 2019, Sydney, Australia.
- Workshop "Approximation, sampling, and compression in high dimensional problems", Isaac Newton Institute for Mathematical Sciences, Cambridge, United Kingdom, June 16-23, 2019
- Conference Optimal Point Configurations and Potential Theory, CIEM, Castro Urdiales, Cantabria, Spain, April 8th-11th, 2019
- Final AMMODIT Conference "Mathematics for Life Sciences", March 18-22, 2019, Kyiv, Ukraine.
- RICAM Special Semester on Multivariate Algorithms and their Foundations in Number Theory, Workshop: Discrepancy, Linz, Austria November 30, 2018.
- Computational Analysis Seminar, October 24, 2018,Vanderbilt University, Nashville, USA.
- Midwestern Workshop on Asymptotic Analysis, October 6, 2018, Indiana University, Bloomington, USA
- Hypercomplex Seminar 2018 "(Hyper)Complex Analysis in Differential Equations, Geometry and Physical Applications"; Bedlewo (Poland), July 22-29, 2018;
- MCQMC conference, Rennes, France, July 1-6; 2018

- Conference “Harmonic Analysis and Applications”, Strobl, Austria, June 4-8, 2018;
- Collloquium des Instituts für Mathematik, University of Lubeck, May 31, 2018;
- ICERM Semester Program on "Point Configurations in Geometry, Physics and Computer Science", February 25- March 25, 2018, ICERM, Brown University, USA:
- Program on “Tractability of High Dimensional Problems and Discrepancy”, the Research Centre Erwin Schrödinger International Institute for Mathematics and Physics (ESI) of the University of Vienna, September 11 - October 13, 2017;
- Hypercomplex Seminar 2017; Bedlewo (Poland), July 22-29, 2017;
- International Conference in Approximation Theory; Savannah (USA), May 8-11, 2017;
- Workshop Optimal Point Configurations and Orthogonal Polynomials 2017; Castro Urdiales (Spain), April 19-22, 2017;
- 7th European Congress of Mathematics, Berlin, July 18-22, 2016;
- Seminars in Complex Analysis of State University of Applied Science in Chelm, Poland, 2011 – 2016;
- International seminar "Hypercomplex Seminar 2016, Bedlewo, Poland, June 30- July 7 2016;
- Third Conference "Mathematics for Life Sciences", Rivne, Ukraine, September 15-19, 2015;
- International seminar "Hypercomplex Seminar 2015: (Hyper)Complex and Dynamical Processes; Modelling and Simulations", Bedlewo, Poland, 2015;

PREPRINTS

Austin Anderson, Maria Dostert, Peter J. Grabner, Ryan W. Matzke, Tetiana A. Stepaniuk, Riesz and Green energy on projective spaces, arXiv:2204.04015 https://arxiv.org/abs/2204.04015

LIST OF PUBLICATIONS

1. A. Ebert, P. Kritzer, O. Osisiogu, T. Stepaniuk, Construction of good polynomial lattice rules in weighted Walsh spaces by an alternative component-by-component construction (2022, online: 2021), Mathematics and Computers in Simulation, Bd. 192, S. 399-419, https://doi.org/10.1016/j.matcom.2021.09.007

2. A. Ebert, P. Kritzer, O. Osisiogu, T. Stepaniuk, Component-by-component digit-by-digit construction of good polynomial lattice rules in weighted Walsh spaces (2021) Constructive Approximation https://doi.org/10.1007/s00365-021-09554-1

3. A.S. Serdyuk and T.A. Stepanyuk, About Lebesgue inequalities on the classes of generalized Poisson integrals, Jaen J. Approx. Volume 12 (2020) 25- 40. http://www.ujaen.es/revista/jja/volumes-papers-0012-01.php

4. A.S. Serdyuk and T.A. Stepanyuk, Uniform approximations by Fourier sums on classes of convolutions of periodic functions, (2020) to appear in Bull. Soc. Sci. Lettres Lodz. Ser. Rech. Deform., arXiv:2001.00374 https://arxiv.org/abs/2001.00374

5. A.S. Serdyuk and T.A. Stepanyuk, Asymptotically best possible Lebesque-type inequalities for the Fourier sums on sets of generalized Poisson integrals, (2020) FILOMAT 34:14 4697–4707 https://doi.org/10.2298/FIL2014697S

6. T.A. Stepanyuk, Hyperuniform point sets on flat tori: deterministic and probabilistic aspects, Constr Approx (2020). https://doi.org/10.1007/s00365-020-09512-3

7. T.A. Stepanyuk, (2020) Estimates for logarithmic and Riesz energies for spherical t-designs. In: Tuffin B., L'Ecuyer P. (eds) Monte Carlo and Quasi-Monte Carlo Methods. MCQMC 2018. Springer Proceedings in Mathematics & Statistics, vol 324. Springer, Cham. https://doi.org/10.1007/978-3-030-43465-6_23

8. T.A. Stepanyuk, (2020) Order Estimates of Best Orthogonal Trigonometric Approximations of Classes of Infinitely Differentiable Functions. In: Raigorodskii A., Rassias M. (eds) Trigonometric Sums and Their Applications. Springer, Cham. https://doi.org/10.1007/978-3-030-37904-9_13

9. Grabner P., Stepanyuk T.A.: Comparison of probabilistic and deterministic point sets, Journal of Approximation Theory, 239 (2019) 128-143. https://doi.org/10.1016/j.jat.2018.12.001

10. Grabner P., Stepanyuk T.A.: Upper and lower estimates for numerical integration errors on spheres of arbitrary dimension, Journal of Complexity, 53 (2019), 113-132. https://doi.org/10.1016/j.jco.2018.11.002

11. A.S. Serdyuk and T.A. Stepanyuk, Uniform approximations by Fourier sums on classes of generalized Poisson integrals, Analysis Mathematica 45, 201–236 (2019). https://doi.org/10.1007/s10476-018-0310-1

12. A.S. Serdyuk and T.A. Stepanyuk, Lebesque-type inequalities for the Fourier sums on classes of generalized Poisson integrals, Bull. Soc. Sci. Lettres Lodz. Ser. Rech. Deform., Vol. 68 No 2(2018), https://doi.org/10.26485/0459-6854/2018/68.2/4

13. U. Z. Grabova, I. V. Kal'chuk, T. A. Stepaniuk, Approximative properties of the Weierstrass integrals on the classes W^r_βH^α, Journal of Mathematical Sciences., 231:1 (2018), 41-47 https://doi.org/10.1007/s10958-018-3804-2

14. A.S. Serdyuk and T.A. Stepanyuk, Approximations by Fourier sums of classes of generalized Poisson integrals in metrics of spaces Ls, Ukr. Math. J., 69:5 (2017), 811-822. https://doi.org/10.1007/s11253-017-1397-4

15. U. Z. Grabova, I. V. Kal'chuk, T. A. Stepanyuk, On the Approximation of the Classes WβrHα by Biharmonic Poisson Integrals, Ukr. Math. J., 70:5 (2018), 719-729 https://doi.org/10.1007/s11253-018-1528-6

16. U. Z. Grabova, I. V. Kal'chuk, T. A. Stepanyuk, Approximation of functions from the classes W^r_βH^α by Weierstrass Integrals, Ukr. Math. J., 69:3 (2017), 598-608 https://doi.org/10.1007/s11253-017-1383-x

17. A.S. Serdyuk and T.A. Stepanyuk, Uniform approximations by Fourier sums on classes of convolutions with generalized Poisson kernels, Dopov. Nats. Akad. Nauk Ukr.,Mat. Pryr. Tekh. Nauky, No. 11 (2016) [in Ukrainian] https://doi.org/10.15407/dopovidi2016.11.010

18. A.S. Serdyuk and T.A. Stepanyuk, Estimates for approximations by Fourier sums, best approximations and best orthogonal trigonometric approximations of the classes of (ψ,β)-differentiable functions, Bull. Soc. Sci. Lettres Lodz. Ser. Rech. Deform., vol. 66, No 2 (2016), 35-43. https://journals.indexcopernicus.com/search/article?articleId=1476129

19. A.S. Serdyuk and T.A. Stepanyuk, Estimates for the best orthogonal trigonometric approximations of the classes of convolutions of periodic functions of not high smoothness, Dopov. Nats. Akad. Nauk

Ukr.,Mat. Pryr. Tekh. Nauky, No. 7 (2015), 13-19. [in Ukrainian] https://doi.org/10.15407/dopovidi2015.07.013

20. A.S. Serdyuk and T.A. Stepanyuk, Order estimates for the best orthogonal trigonometric approximations of the classes of convolutions of periodic functions of low smoothness, Ukr. Math. J., 67:7 (2015), 1-24. https://doi.org/10.1007/s11253-015-1134-9

21. A.S. Serdyuk and T.A. Stepanyuk, Estimates of the best m-term trigonometric approximations of classes of analytic functions, Dopov. Nats. Akad. Nauk Ukr., Mat. Pryr. Tekh. Nauky, No. 2 (2015), 32-37. [in Ukrainian] https://doi.org/10.15407/dopovidi2015.02.032

22. A.S. Serdyuk, T.A. Stepanyuk, Order estimates for the best approximations and approximations by Fourier sums in the classes of convolutions of periodic functions of low smoothness in the uniform metric, Ukr. Math. J., 66:12 (2015), 1862-1882. https://doi.org/10.1007/s11253-015-1056-6

23. Yu.I. Kharkevich, T.A. Stepanyuk, Approximative properties of Poisson integrals on the classes C^{\psi}_{\beta}H_{\omega}, Math. Notes 96: 5 (2014), 1008-1019. https://doi.org/10.1134/S0001434614110406

24. A.S. Serdyuk, T.A. Stepanyuk, Estimates for the best approximations of the classes of innately differentiable functions in uniform and integral metrics, Ukr. Math. J., 66:9 (2015), 1393-1407. https://doi.org/10.1007/s11253-015-1018-z

25. T.A. Stepaniuk, Estimates of the best approximations and approximations of Fourier sums of classes of convolutions of periodic functions of not high smoothness in integral metrics, Zb. Pr. Inst. Mat. NAN Ukr. 11:3 (2014), 241-269. [in Ukrainian] http://trim.imath.kiev.ua/index.php/trim/article/view/80

26. A.S. Serdyuk, T.A. Stepaniuk, Order estimates for the best approximation and approximation by Fourier sums of classes of infinitely differentiable functions, Zb. Pr. Inst. Mat. NAN Ukr. 10:1 (2013), 255-282. [in Ukrainian]http://trim.imath.kiev.ua/index.php/trim/article/view/180

27. I.V. Kalchuk and T.A. Stepaniuk, About connection of quantities of approximation of differentiable functions in metrics and L, Nauk. Visnyk Cherniv. yniver.: Zb. Nayk. Pr., Chernivtsi, 528 (2010), 70-74. [in Ukrainian] http://bmj.fmi.org.ua/index.php/adm/article/view/714

28. J. Zajac, I.V. Kalchuk and T.A. Stepanyk, Approximation of the functions from Sobolevs classes in uniform and integral metrics, Bulletin: de la societe des sciences et des letters de lodz, Vol LIX (2009), no.2, 9-17. http://79.96.70.35/ltn/archiwalne/BULLETIN_59-2_2009.pdf