Oleksandr Vlasiuk

Contact information

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Education

1. Vanderbilt University, Nashville, TN; Mathematics; Ph.D., 2018

2. Université du Sud, Toulon-Var, Toulon, France; Master I Mathématiques, 2013

3. Taras Shevchenko National University of Kyiv, Kyiv, Ukraine; B.Sc., 2013

Appointments

2018–present: **Postdoctoral Scholar**, Florida State University, Tallahassee, FL

Publications

1. with A. Reznikov, **Riesz energy on self-similar sets**, Proc. Am. Math. Soc., accepted.
   doi:10.1090/proc/14663, arXiv:1810.01557

2. with T. Michaels, N. Flyer, and B. Fornberg, **Fast high-dimensional node generation with variable density**, Comput. Math. Appl. 76 (2018), no. 7, 1739–1757.
   doi:10.1016/j.camwa.2018.07.026, arXiv:1710.05011

3. with A. Reznikov and E. B. Saff, **A minimum principle for potentials with application to Chebyshev constants**, Potential Anal. 47 (2017), no. 2, 235–244.
   doi:10.1007/s11118-017-9618-x, arXiv:1607.07283

4. with D. P. Hardin and E. B. Saff, **Generating Point Configurations via Hypersingular Riesz Energy with an External Field**, SIAM J. Math. Anal. 49 (2017), no. 1, 646–673.
   doi:10.1137/16m107414x, arXiv:1605.03840

5. with D. Leviatan and I. A. Shevchuk, **Positive results and counterexamples in comonotone approximation II**, J. Approx. Theory 179 (2014), 1–23.
   doi:10.1016/j.jat.2013.11.004

Preprints

1. **Discreteness of the minimizers of weakly repulsive interaction energies on Riemannian manifolds**, arXiv:2003.01597

2. with Dmitriy Bilyk, Alexey Glazyrin, Ryan Matzke, and Josiah Park, **Energy on spheres and discreteness of minimizing measures**, arXiv:1908.10354

3. with Dmitriy Bilyk, Alexey Glazyrin, Ryan Matzke, and Josiah Park, **Optimal measures for p-frame energies on spheres**, arXiv:1908.00885

Papers in preparation

1. with D. P. Hardin and E. B. Saff, **Asymptotic properties of short-range interaction functionals**, *in preparation.*

Grants and awards

1. AMS-Simons Travel Grant 2020

2. Florida State University Postdoctoral Travel Award, September 2019

3. Collaborate@ICERM "Codes and Designs: Optimal Discrete Measures", January 2021. Joint with Dmitriy Bilyk, Alexey Glazyrin, Ryan Matzke, and Josiah Park.

4. Vanderbilt Graduate Travel Award, September 2016

Presentations and talks

1. Conference presentations

   1) (upcoming) CBMS Conference, Florida State University, August 2021, *poster presentation*

   2) (upcoming) Point Configurations: Deformations and Rigidity, LMS Research School, University College London, July 2021

   3) (upcoming) ESI Program on "Optimal Point Configurations on Manifolds", January 2021

   4) "Properties of measures that minimize integral energy functionals on the sphere", AMS Sectional meeting, Gainesville FL, November 2019

   5) "Sparsity of supports of measures minimizing integral energy functionals", SIAM-SEAS, Knoxville, September 2019

   6) "Properties of minimizers of quadratic functionals over probability measures on homogeneous spaces", Barcelona Analysis Conference, University of Barcelona, June 2019

   7) "Minimizers of quadratic functionals over probability measures on the sphere", Approximation, sampling, and compression in high dimensional problems (workshop), *poster presentation*, INI Cambridge, June 2019

   8) "Minimizing p-frame energies (and other continuous functionals with radial kernels)" Approximation Theory 16, Vanderbilt University, Nashville, May 2019

   9) "Minimizers of quadratic functionals over probability measures on the sphere", Madison Lectures in Fourier Analysis, *poster presentation*, UW Madison, May 2019

   10) "Minimizing continuous functionals over probability measures", Shanks Workshop on Energy, Packing, and Covering, Vanderbilt University, Nashville, May 2019

11) "Minimizing p-frame energies", SEAM, University of Alabama, Tuscaloosa, March 2019

12) "Γ-convergence of hypersingular Riesz energy functionals", Multivariate Algorithms and their Foundations in Number Theory, Johann Radon Institute, Linz, November 2018

13) "Γ-convergence of hypersingular Riesz energy functionals", Texas Analysis and Mathematical Physics Symposium, Baylor University, October 2018

14) "High-dimensional node generation with variable density", Fast Algorithms for Generating Static and Dynamically Changing Point Configurations, ICERM, March 2018

15) "Variable density node distribution: Riesz minimizers and irrational lattices", Computational Methods and Function Theory, Lublin, July 2017

16) "Generating point configurations via hypersingular Riesz energy with an external field", Joint Mathematics Meetings, Atlanta, January 2017

17) 1st Northeastern Analysis Meeting, the College at Brockport, SUNY, October 2016

18) Optimal and random point configurations, Institut Henri Poincaré, Paris, June-July 2016, *poster presentation*

2. Seminar and non-research talks

1) Fourier transform, sparsity, and compressed sensing, FSU Machine Learning seminar, November 2019

2) Sphere Packings and Optimal Configurations (summer school), Hausdorff Center for Mathematics, September 2019

3) "Minimizing p-frame energies", Mathematics Colloquium, Florida State University, Tallahassee, January 2019

4) "Sumset estimates and the Menger's theorem", Analysis seminar, Florida State University, November 2018

5) "Variable density node distribution: Riesz minimizers and irrational lattices", Computational and Applied Mathematics seminar, Oak Ridge National Laboratory, January 2018

6) "Discretizing distributions with Riesz minimizers and irrational lattices", Analysis seminar, Florida State University, November 2017

7) "Basics of large deviations and Cramér's theorem", Analysis seminar, Vanderbilt University, June 2017,

8) "Ball multiplier problem", Analysis seminar, Vanderbilt University, April 2017,

9) "Finite Grassmannian frames, spherical codes, and equiangular lines", Analysis seminar, Vanderbilt University, April 2016,

10) "Riesz energy with an external field", Analysis seminar, Vanderbilt University, April 2015.

3. Workshop visits

1) (online) Online Summer School on Optimization, Interpolation and Modular Forms, EPFL, August 2020

2) (online) Optimal transport and applications to machine learning and statistics, MSRI, May 2020

3) Midwestern Workshop on Asymptotic Analysis, Indiana University in Bloomington, October 2015

4) Minimal Energy Point Sets, Lattices, and Designs, ESI, Vienna, October 2014

5) Recent Methods in Sphere Packing and Optimization, Oberwolfach, June 2014

Teaching

1. Measure and Integration I, Florida State University, Fall 2020

2. Calculus II, Florida State University, Spring 2019–Fall 2020

3. Calculus II, Vanderbilt University, Fall 2017 (*TA*)

4. Statistical learning, Vanderbilt University, Fall 2017 (*TA*)

5. Calculus I, Vanderbilt University, Fall 2015–Spring 2017 (*TA*)

Service

1. Coorganizer of Point Distributions Webinar, June–August 2020

2. Coorganizer of the minisymposium "Applications of discrete and continuous energy", Shanks Conference, Vanderbilt University, May 2021

3. Coorganizer of the International Conference on Approximation and Potential Theory, Georgia Southern University, March 2021 (tentative date)

4. Coorganizer of the special section "Frames, designs, and optimal spherical configurations", Joint Mathematics Meetings, Denver, January 2020

5. Reviewer for AMS Mathematical Reviews, Constructive Approximation, Journal of Approximation Theory.

Outreach

1. Participant of STEM nights at Pineview Elementary School, organized by the National MagLab

2. Working with undergraduate students through the UROP research program at FSU

3. Organized the Undergraduate Mathematics Seminar at FSU in Fall 2019–Spring 2020

4. Participant of the Math Fun Day at Florida State University in 2018, one of the biggest scientific outreach events at FSU with over 1400 visitors

5. Have given lectures at the Undergraduate Pizza and Mathematics Seminar at Vanderbilt University

6. Have given lectures for high school students at the Math Circle at Vanderbilt University

Language proficiency and technical skills ─────────────────────────────

1. Natural languages: English, Russian, Ukrainian (fluent); French (intermediate), Polish (beginner)

2. Programming languages: C++, CUDA C++, Python, Matlab, R

3. Development tools: Git, Make, GDB, common UNIX CLI tools

Updated: August 7, 2020.