

**Oleksandra V. Beznosova**

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## PERSONAL INFORMATION

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*U.S. Permanent Resident*

## RESEARCH INTERESTS

Areas of expertise:

- Harmonic analysis and PDE's: wavelets, weight theory and weighted norm inequalities, Bellman function method (dynamic programming);
- Computational analysis: minimal discrete energy, interpolation with Leja points, discrepancy;
- Probability: machine learning and probabilistic methods in harmonic analysis.

Areas of interest:

- Machine learning;
- Computer vision and inverse problems;
- Big data, one-bit sensing.

## EDUCATION

**University of New Mexico**, Albuquerque, New Mexico USA

Ph.D. (with distinction), Mathematics, May 2008

- Dissertation: "Bellman functions, paraproducts, Haar multipliers and weighted inequalities."
- Adviser: Maria Cristina Pereyra

M.S. (with distinction), Mathematics, December 2003

**National Technical University of Ukraine "KPI"**, Kiev, Ukraine

M.S., System Analysis and Control, July 2002

Bachelor (with distinction), Applied Mathematics, July 2000

## ACADEMIC EXPERIENCE AND PROFESSIONAL

**University of Alabama**, Tuscaloosa, AL USA

*Tenure-track Assistant Professor*

August, 2014 - present

**Baylor University**, Waco, Texas USA

*Post Doctoral Fellow, Assistant Research Professor*

August, 2011 - July, 2014

**University of Missouri-Columbia**, Columbia, Missouri USA

*Post Doctoral Fellow*

August, 2008 - July, 2011

**University of New Mexico**, Albuquerque, New Mexico USA

*Teaching Assistant*

August, 2001 - July, 2008

## SERVICE AND REVIEW

**National Science Foundation panelist**

2011 - 2012

**Reviewer & Referee:**

Croatian Science Foundation, Indiana University Mathematics Journal, Journal of Mathematical Anal-

ysis and Applications, Journal of Functional Analysis, Journal of Geometric Analysis, Applied and Computational Harmonic Analysis, Journal of Mathematical Inequalities

**Organizer:**

- AMS Western Spring Sectional Meeting #1099, UNM, Albuquerque, NM April 5-6, 2014;
- Joint AMS/MAA Mathematics Meeting, Atlanta, GA January 4-7, 2017.

GRANTS AND AWARDS

**University of Alabama RGC Summer Research Grant \$6,000.**

2015

SKILLS

C++, CUDA, Pascal.

PROJECTS

Developed and supported driver and software for high voltage AC bridge device Vector 1.0, 2.0 for the Institute of Electrodynamics in Kiev, Ukraine (2001 - 2008); C++ (MFC).

Developed encrypting software based on AES algorithm for data security (2005); C++.

Developing programs for various computational problems in mathematics, such as star discrepancy conjecture, minimum energy point configurations, interpolation with Leja points (2015-Now); C++, CUDA.

PUBLICATIONS

**Accepted and Appeared:**

1. O. Beznosova, B. Krylov. Wavelet transformation and its applications in spectral signal analysis. *Collection of the works of young scientists, IASA NTUU KPI*, p.16, Kyiv 2000.
2. V. Koltchinskii, O. Beznosova. Exponential Convergence Rates in Classification. *Lecture Notes in Computer Science*, 3559:295-307, 2005.
3. O. Beznosova. Linear bound for the dyadic paraproduct on weighted Lebesgue space  $L_2(w)$ . *Journal of Functional Analysis*, 255(no.4):994-1007, 2008.
4. O. Beznosova, J.C. Moraes, M.C. Pereyra. Sharp bounds for T-Haar multipliers on  $L_2$ . *Contemporary Mathematics*, 612, 45-65, 2014.
5. O. Beznosova, P.A. Hagelstein. Continuity of halo functions associated to homothety invariant density bases. *Colloq. Math.* 134, 235-243, 2014.
6. O. Beznosova, A. Reznikov. Equivalent definitions of dyadic Muckenhoupt and Reverse Hölder classes in terms of Carleson sequences, weak classes, and comparability of dyadic  $L \log L$  and  $A_\infty$  constants. *Revista Matemática Iberoamericana*, 30(4), 1191-1236, 2014.
7. O. Beznosova, A. Reznikov. Sharp estimates involving  $A_\infty$  and  $L \log L$  constants, and their applications to PDE. *St. Petersburg Math. J.* 26, 27-47, 2015.
8. O. Beznosova, T.E. Ode. Mutual estimates for the dyadic Reverse Holder and Muckenhoupt constants for the dyadically doubling weights. *Involve*, to appear.
9. O. Beznosova, D. Chung, J.C. Moraes, M.C. Pereyra. On two weight estimates for dyadic operators. *Harmonic Analysis and Operator Theory - In honor of Cora Sadosky*, invited, to appear.

10. O. Beznosova. Perfect dyadic operators: weighted  $T(1)$  theorem and two weight estimates. *Journal of Mathematical Analysis and Applications*, 2016.

**In Progress:**

11. Numerical approach to the star discrepancy conjecture.

12. On the Lebesgue constant for Leja points. (joint work with A. Reznikov)

CLASSES TAUGHT

**UA:** Calculus (II, III), Intro to Probability

**Baylor 2011-2014:** Calculus (I, II), Linear Algebra, Selected topics in Harmonic Analysis, Topics in Harmonic Analysis: Bellman Functions, Construction and Evaluation of Actuarial models

**Mizzou 2008-2011:** Calculus (for Social Sciences, I, II, III)

**UNM 2001-2008:** Trigonometry, Pre-calculus, Calculus (I, II, III, Advanced), MTCTP

INVITED SPEAKER

“Perfect dyadic operators: weighted  $T(1)$  theorem and two weight estimates.” *Spring Southeastern Sectional Meeting* University of Georgia, Athens, GA, March 5-6, 2016

“Two-weighted norm inequalities for dyadic paraproduct.” *Biannual conference of the Royal Spanish Mathematic Society (RSME)* Granada, Spain, February 2-6, 2015

“Continuity of halo function associated to any homothety invariant density bases.” *Semester Workshop Discrepancy Theory* ICERM, Brown University, Providence, RI, October 27-31, 2014

“Muckenhoupt and Reverse Holder classes of weights via summation conditions.” *Workshop for Women in Analysis and PDE* - Minneapolis, MN, May 30-June 2, 2012

“Equivalent definitions of Muckenhoupt and Reverse Holder classes of weights via summation conditions.” *2012 AMS Spring Central Section Meeting* - Lawrence, KS, March 30-April 1, 2012

“Equivalent forms of the  $A_\infty$  condition and applications.” *Doc-course: Harmonic Analysis, Metric Spaces and Applications to P.D.E.* - Seville, Spain, May 15th - July 15th, 2011

“The limiting case of the Reverse Hölder inequalities and the  $A_\infty$  condition.” *2011 AMS Spring Southeastern Section Meeting* - Statesboro, GA, March 12-13, 2011

“A New Sharp Version of Buckley’s Inequality” *26th Southeastern Analysis Meeting (SEAM 2010)* - Atlanta, GA, March 25-28 2010

“Linear with respect to the  $A_2$ -constant of the weight  $w$  bound on the norm of the perfect dyadic operator on the weighted Lebesgue spaces  $L^2(w)$ .” *34th University of Arkansas Spring Lecture Series* - Fayetteville, AR, April 16-18 2009

TALKS

“The star discrepancy conjecture.” *Vanderbilt University Computational Analysis Seminar*, Nashville, TN, March 16, 2016

“On the continuity properties of the halo function.” *AMS Western Spring Sectional Meeting*, Albuquerque, NM, April 5 - 6, 2014

“Sharp Bounds for  $t$ -Haar Multipliers in  $L_2$ .” *Joint AMS-MAA meetings*, Baltimore, MD, January 15 - 18, 2014

" $A_\infty$  class as a limit of Reverse Hölder classes. Limiting case of the Gehring Lemma." *Spring School on Analysis*, Paseky Nad Jizerou, Czech Republic, May 29 - June 4, 2011

"The limiting case of the Reverse Hölder inequalities and the  $A_\infty$  condition." *Michigan State Univ. Analysis seminar* - East Lansing, MI, March 30, 2011

"The limiting case of the Reverse Hölder inequalities and the  $A_\infty$  condition." *Kansas State Univ. Analysis Seminar* - Manhattan, KS, February 23, 2011

"The limiting case of the Reverse Hölder inequalities and the  $A_\infty$  condition." *The 2011 Ohio River Analysis Meeting* - Cincinnati, Ohio, January 29-30, 2011

"The limiting case of the Reverse Hölder inequalities and the  $A_\infty$  condition." *University of Missouri Analysis Seminar* - Columbia, MO, November 16, 2010

"The limiting case of the Reverse Hölder inequalities and the  $A_\infty$  condition." *Tenth Prairie Analysis Seminar* - Lawrence, KS, October 29-30, 2010

"Astala's Conjecture on Distortion of Hausdorff Measures under Quasiconformal Maps in the Plane by M.T. Lacey, E.T. Sawyer, I. Uriarte-Tuero" *UCLA SUMMER/FALL SCHOOL Weighted estimates for singular integrals* - Lake Arrowhead, CA, October 3-8, 2010

"A new sharp version of Buckley's inequality." *2010 Spring Western Section Meeting* - Albuquerque, NM, April 17-18, 2010

"Linear bound for the dyadic paraproduct on weighted Lebesgue space  $L_2(w)$ ." *Michigan State Univ. Analysis seminar* - East Lansing, MI, November 25, 2009

"Linear bound on the norm of perfect dyadic operators on weighted Lebesgue spaces  $L^2(w)$ , with respect to the  $A_2$ -constant of the weight  $w$ ." *12th New Mexico Analysis Seminar* - Albuquerque, NM, April 23-25, 2009

"Bounds on the norm of the dyadic paraproduct on weighted Lebesgue spaces." *Eight Prairie Analysis Seminar* - Lawrence, KS, November 7-8, 2008

"Sharp bounds on the norm of the dyadic paraproduct on weighted Lebesgue spaces." *11th New Mexico Analysis Seminar* - Las Cruces, NM, April 4-6, 2008

"Bounds on the norm of the dyadic paraproduct on weighted Lebesgue spaces." *AMS Southwestern Regional Meeting Special Session on Harmonic Analysis and Operator Theory* - Albuquerque, NM, October 13-14, 2007

#### WORKSHOPS AND SUMMER SCHOOLS

Weighted singular integral operators and non-homogenous harmonic analysis workshop - Palo Alto, CA, Oct 9-15, 2011

Bellman functions in Harmonic Analysis Summer school and workshop - INRIA Sophia Antipolis, France, June 14-17, 2011

Four Advanced Courses on Quasiconformal Mappings, PDE and Geometric Measure Theory - Bellaterra, Barcelona, Spain, June 3-12, 2009

Harmonic Analysis, Geometric Measure Theory and Quasiconformal Mappings - Bellaterra, Barcelona, Spain, June 14-20, 2009