

Oksana Bihun

Department of Mathematics
and Computer Science
Concordia College
901 8th St S
Moorhead MN 56562

Phone: (218) 299-4396 (work)
(218) 443-0988(cell)
Fax: (218) 299-4308
obihun@cord.edu

Full Name

Oksana Hryhorivna Bihun

Birthplace

February 29, 1980, Lviv, Ukraine

Citizenship

Ukraine
Current type of visa: H-1B

Education

Doctor of Philosophy in Mathematics, 2009
Thesis Title: Approximate Isometries and Distortion Energy Functionals
Thesis advisor: Professor Carmen Chicone
University of Missouri, Columbia, USA

Master in Applied Mathematics, 2005
Department of Mathematics
University of Missouri, Columbia, USA

Specialist (equivalent of Master) in Applied Mathematics, 2001
Department of Applied Mathematics and Informatics
Ivan Franko National University of Lviv, Ukraine

Lviv Secondary School No. 40, Ukraine, 1986-1996
Kos-Anatolsky Lviv Secondary Music School No.1, class of piano and bandura, Ukraine,
1986-1994

Research Interests

Geometric Analysis, Global Analysis and Analysis on Manifolds, Optimization on Infinite Dimensional Spaces, Calculus of Variations and Optimal Control, Differential Geometry, Applied Mathematics and Numerical methods

Research

Saint Louis University
Visiting Fellow
Professor Steven Harris
Minimal distortion morphing in the problems of medical imaging
St. Louis, MO, USA
Summer 2008

University of Missouri, Columbia
Ph.D. Student, Research Assistant (2005-08)
Professor Carmen Chicone
Minimal strain energy bending and morphing of compact Riemannian manifolds
Columbia, MO, USA
2003 – 2009

AGH University of Science and Technology
Visiting Research Fellow, multiple visits
Professor Anatoly Prykarpatsky, Assistant Mirosław Luśtyk
Lie-algebraic scheme of discrete approximations for solving dynamical systems
Finite-dimensional reductions of nonlinear dynamical systems on functional manifolds
Kraków, Poland
2002–2003

Ivan Franko National University of Lviv
Research Assistant
Professor Mykola Prytula
Numerical analysis of Burgers' equation
Numerical simulation of white noise influence on solutions of the Korteweg - de Vries equation
Lviv, Ukraine
2000-2001

List of Publications

Papers

Preprints

1. (with C. Chicone and S. Harris) *Minimal Distortion Morphs Generated by Time-dependent Vector Fields*, Preprint 2008, 41 pages, submitted,
URL <http://arxiv.org/abs/0810.4357>.

Published or Accepted Papers

In journals reviewed on MathSciNet

Note: Due to multiple ways of transliteration from the Ukrainian alphabet, my last name appears on MathSciNet as either Bihun or Bigun.

1. (with C. Chicone) *Distortion Minimal Morphing: the Theory for Stretching*, Rocky Mountain Journal of Mathematics, Vol. 39, No. 1, 2009
URL <http://arxiv.org/abs/math.DG/0605668>.
2. (with C. Chicone) *Deformation Minimal Bending of Compact Manifolds: Case of Simple Closed Curves*, Opuscula Mathematica, Vol. 28, No. 1 (2008), 19–28.

URL <http://arxiv.org/abs/math.OC/0701901>.

3. (with A. Prykarpatsky) *A Construction of Finite-Dimensional Reductions on Functional Manifolds*, Mathematical Methods and Physicomechanical Fields, Vol. 48, No. 1 (2005), 7–14. (In Ukrainian)
4. *A Modification of the Lie-Algebraic Scheme and Approximation Error Estimates*, Mathematical Studies, Vol. 20, No. 2 (2003), 179–184.
5. (with M. Luśtyk) *Approximation Properties of the Lie-Algebraic Scheme*, Mathematical Studies, Vol. 20, No. 1 (2003), 7–14.

In other journals (refereed journals are marked with a star)

1. (with M. Prytula). *The Method of Lie-Algebraic Approximations in the Theory of Dynamical Systems*, Mathematical Bulletin of Shevchenko Scientific Society, Vol. 1 (2004), 24–31. (In Ukrainian)
2. * (with M. Luśtyk) *Numerical Tests and Theoretical Estimates for a Lie-Algebraic Scheme of Discrete Approximations*, Bulletin of Lviv University, Ser. Appl. Math. and Comp. Science, Vol. 6 (2003), 22–31.
3. * (with M. Prytula) *Numerical Simulation of White Noise Influence to Solutions of the Korteweg - de Vries Equation*, Bulletin of Lviv University, Ser. Appl. Math. and Comp. Science, Vol. 4 (2002), 11–16. (in Ukrainian)
4. * (with M. Prytula) *A Numerical Scheme for Solving Burgers' Equation Using Schemes for the Heat Equation*, Bulletin of Lviv University, Ser. Appl. Math. and Comp. Science, Vol. 3 (2000), 53–60. (in Ukrainian)

Invited Talks

- *Minimal Distortion Bending and Morphing of Compact Manifolds*, Delaware State University, March 2009.
- *Minimal Distortion Bending of Manifolds*, Concordia College, December 2008.
- *Approximate Isometries and Distortion Energy Functionals*, University of Toledo, OH, USA, November 2008.
- *Minimal Distortion Morphing for the Purposes of Medical Imaging*, Saint Louis University, Missouri, USA, June 2008.
- *Deformation Minimal Bending of Riemann Surfaces. Holomorphic Critical Points*, Seminar on Nonlinear Analysis, AGH University of Science and Technology, Kraków, Poland, January 2007. (in Polish)
- *Optimization of the Distortion Energy of Diffeomorphisms between Compact Riemannian Manifolds*, Fakultät für Mathematik und Physik, Eberhard Karls Universität Tübingen, Germany, December 2006.

Conference Talks and Presentations

Abstracts

1. (with C. Chicone) *Optimization of the Distortion Energy Functional over Homotopy Classes of Diffeomorphisms*. Abstracts of Papers Presented to American Mathematical Society, Vol. 28, No. 3, p. 121 (2007 Fall Central Section Meeting, Chicago, IL).
2. (with C. Chicone) *Deformation Minimal Bending and Morphing of Riemannian Manifolds*, Abstracts of Midwest Geometry Conference 2007, Iowa City, Iowa, USA.
3. (with C. Chicone) *Distortion Minimal Morphing of Compact Embedded Manifolds*. Abstracts of Papers Presented to American Mathematical Society, Vol. 17, No. 3, p. 560 (2006 Fall Western Section Meeting, Salt Lake City).
4. (with M. Prytula) *Lie-Algebraic Approach to Approximate Solving of Problems of Mathematical Physics*, Proceedings of the 9th Ukrainian National Scientific Conference “Modern Problems of Applied Mathematics and Informatics”, Lviv, 2003, 11–13. (in Ukrainian)
5. (with M. Prytula) *Approximation Convergence and Structure Relations for Quasi-Representations in the Lie-Algebraic Scheme*, Proceedings of The 6th International Scientific Conference on Mathematical Problems of Mechanics of Nonhomogeneous Structures, Lviv, 2003, 494–496. (in Ukrainian)
6. (with M. Prytula) *Modification of the Lie-Algebraic Scheme for Solving Cauchy Problems with Boundary Conditions*, Proceedings of the International Conference “The 6th Bogolubov Readings”, Chernivtzi, Ukraine, 2003, 7–8. (in Ukrainian)
7. (with M. Prytula) *Application of the Lie-Algebraic Scheme to Solving Cauchy Problems with Quasilinear Differential Operator*, Proceedings of the International Conference on Complex Analysis and its Applications, Lviv, 2003, 12–13. (in Ukrainian)
8. (with M. Prytula) *Numerical Aspects of the Application of the Lie-Algebraic Discrete Approximation Method*, Proceedings of the 9th Ukrainian National Scientific Conference “Modern Problems of Applied Mathematics and Informatics”, Lviv, 2002, 7–8. (in Ukrainian)
9. (with M. Prytula) *A Method of Lie-Algebraic Approximations of Cauchy Problems*, International Conference “Inverse Problems and Nonlinear Equations”, Book of abstracts, Kharkiv, Ukraine, 2002, 7–8.
10. (with M. Prytula) *A Method of Lie-Algebraic Approximations of One Cauchy Problem for Evolution Equation in Partial Derivatives*, Proceedings of the International Conference on the Theory of Evolution Equations, Kamyanyets-Podilskyj, 2002, p. 27. (in Ukrainian)
11. *Discrete Approximations of Cauchy-Dirichlet Problems in Finite Dimensional Spaces*, Proceedings of the 5th Ukrainian National Student Conference on Appl. Math. and Informatics, Lviv, 2002, 16–17. (in Ukrainian)
12. *Numerical Simulation of the Stochastic Korteweg - de Vries Equation*, Proceedings of the 4th Ukrainian National Student Conference on Appl. Math. and Informatics, Lviv, 2001, 10–11. (in Ukrainian)
13. (with M. Prytula) *Numerical Analysis of the Nonlinear Burgers Equation*, Proceedings of the 7th Ukrainian National Scientific Conference “Modern Problems of Applied Mathematics and Informatics”, Lviv, 2000, 78–79. (in Ukrainian)

14. *Analysis of the Efficiency of the Gauss-Newton Method and its Modification*, Proceedings of the 3rd Ukrainian National Student Conference on Appl. Math. and Informatics, Lviv, 2000, 39-40. (in Ukrainian)

Presentations

1. All talks in the list of abstracts.
2. (with A. Guevara, D. Hristova, O. Klinke, M. Mastin, L. Yang, and E. Zollinger) *Best Convex Interpolation Problem*, Workshop on Continuous Optimization and its Applications, Mathematics Sciences Research Institute, Berkeley, CA, USA, July 2007.
3. *Optimization on Infinite Dimensional Spaces*, Department of Applied Mathematics and Informatics, Lviv National University, Ukraine, 2007. (In Ukrainian)
4. *The Heat Flow Method for Variational Problems in Geometry*, Evolution Equations Learning Seminar, University of Missouri, Columbia, 2006.
5. (with Lauri Oksanen, Dorothee Juny, and Tatjana Eisner) *Spectral Mapping Theorem for Analytic Semigroups*, International Seminar on Analytic Semigroups, Casalmaggiore, Italy, 2005.
6. *Minimal Strain Energy Bending*, Seminars on Nonlinear Analysis, AGH University of Science and Technology, Kraków, Poland, 2005. (in Polish)
7. *Existence of Geodesics via the Direct Method of Calculus of Variations*, Seminar on Optimization Theory, University of Missouri, Columbia, 2005.
8. *Lie-Algebraic Approach to Approximate Solving of Problems of Mathematical Physics*, Seminars on Nonlinear Analysis, AGH University of Science and Technology, Kraków, Poland, 2003. (in Polish)
9. *Numerical Simulation of the Stochastic Korteweg - de Vries Equation*, Seminars on Nonlinear Analysis, AGH University of Science and Technology, Kraków, Poland, 2002. (in Polish)

Fellowships, Grants, Awards

- 2008 CCB/IPAM Mathematics in Brain Imaging Summer Fellow, Center for Computational Biology at UCLA, Institute for Pure and Applied Mathematics.
- Association for Women in Mathematics, Travel Grant for participation in the AWM Workshop held in conjunction with San Diego Joint Mathematics Meetings, January, 2008.
- Research Assistant Fellowship, September 2006 – May 2008, National Science Foundation Grant DMS 0604331, Principal Investigator Professor Carmen Chicone.
- A Diploma with Honor of Specialist (equivalent of Master) of Applied Mathematics, Lviv National University, Ukraine, 2001.
- A Distinction of Excellence at the State Mathematics and English Exams, Lviv National University, Ukraine, 2001.
- Excellent Student Award, Lviv National University, Ukraine, 2000.

- A Diploma with Honor of Completed Secondary Education, Lviv Secondary School No. 40, Ukraine, 1996.

Teaching

Concordia College
 Assistant Professor
Lectures and Problem Solving: Real Analysis I, Precalculus.

Moorhead, MN, USA
 2009–present

University of Missouri
 Teaching Assistant
Lectures and Problem Solving: College Algebra,
 Elements of Calculus for Business Majors,
 Finite Mathematics, Advanced Calculus
Recitations: Calculus II
Tutoring: Mathematica labs and Calculus help sessions

Columbia, MO, USA
 2004–2006

Lviv National University
 Teaching Assistant
Recitations: Discrete Mathematics, Probability Theory
Supervision of undergraduate theses: four students,
Supervision of a Masters thesis

Lviv, Ukraine
 2002–2003

Membership in organizations

- American Mathematical Society, 2003–present;
- Mathematical Association of America, 2005–present;
- Society for Industrial and Applied Mathematics, 2003–present;
- Shevchenko Scientific Society, 2003–present.

Skills

- Languages: English, Russian, Polish (advanced level), German (beginner), Ukrainian (native speaker)
- Computer Skills: Pascal, Delphi, L^AT_EX, Mathematica, Unix, Windows

Hobbies/Interests

Playing piano, bandura and guitar, singing, poetry, psychology, bicycling, dance.