

Curriculum Vitae

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RESEARCH INTERESTS

Geometric and combinatorial group theory. Geometry of $Out(F_n)$. Thompson's groups. Groups acting on rooted trees: self-similar, generated by automata, iterated monodromy groups, contracting and branch groups. Algorithmic aspects of self-similar groups. Developing software for computations in group theory. Free and relatively free groups. Low-dimensional topology.

EDUCATION

- 06/2003 – 08/2009 *Ph.D. in Mathematics*
Texas A&M University, College Station, TX
Advisors: Dr.R. Grigorchuk and Dr.V. Nekrashevych
Title: Asymptotic, algorithmic and geometric aspects of
 groups generated by automata
- 09/2001 – 07/2002 *M.S. in Mathematics, Summa Cum Laude*
Kyiv Taras Shevchenko University, Kyiv, Ukraine
- 09/1997 – 07/2001 *B.S. in Mathematics, Summa Cum Laude*
Kyiv Taras Shevchenko University, Kyiv, Ukraine

WORK EXPERIENCE

- 09/2009 – present *Riley Assistant Professor*
Binghamton University, Binghamton, NY
- 09/2003 – 08/2009 *Teaching Assistant and Instructor*
Texas A&M University, College Station, TX
- 01/2002 – 05/2002 *Teaching Assistant*
Kyiv Taras Shevchenko University, Kyiv, Ukraine

CITIZENSHIP

UKRAINE, currently holding J-1 U.S. visa **without** a 2-year home residency requirement

PUBLICATIONS

Published

1. *On word problem in contracting automorphism groups of rooted trees*, Visnyk Kyivskogo Univ., Ser. Fiz.-Mat. Nauki, 2003, no.1, 51–56
2. *On Sushchansky p -groups* (with I. Bondarenko), Algebra Discrete Math., 2007, no.2, 22–42, <http://arxiv.org/abs/math.GR/0612200>
3. *Groups generated by 3-state automata over a 2-letter alphabet, I*, (with I. Bondarenko, R. Grigorchuk, R. Kravchenko, Y. Muntyan, V. Nekrashevych and Z. Sunic), São Paulo Journal of Math. Sciences, 1 (2007), no.1, 1–40, <http://arxiv.org/abs/math.GR/0612178>
4. *The spectral problem, substitutions and iterated monodromy* (with R. Grigorchuk and Z. Sunik), CRM Proceedings and Lecture Notes 42 (2007), 225–248, <http://arxiv.org/abs/math.GR/0703443>
5. *Classification of groups generated by 3-state automata over a 2-letter alphabet* (with I. Bondarenko, R. Grigorchuk, R. Kravchenko, Y. Muntyan, V. Nekrashevych and Z. Sunic), Algebra and Discrete Mathematics (2008), no.1, 1–163, <http://arxiv.org/abs/0803.3555>
6. *Groups generated by 3-state automata over a 2-letter alphabet, II* (with I. Bondarenko, R. Grigorchuk, R. Kravchenko, Y. Muntyan, V. Nekrashevych and Z. Sunic), Journal of Math. Science (New York), V. 156 (2009), no.1, 187–208, <http://www.arxiv.org/abs/0704.3876>
7. *Some graphs related to the Thompson's group F* , in *Combinatorial and geometric group theory*, Trends in Mathematics (Birkhäuser), edited by O. Bogopolski, I. Bumagin, O. Kharlampovich and E. Ventura, 2010, 279–296, <http://arxiv.org/abs/0803.0043>
8. *Automata generating free products of groups of order 2*, (with Y. Vorobets), Journal of Algebra, V.336 (2011), Issue 1, 53–66, 2011, available at <http://arxiv.org/abs/0806.4801>
9. *On Restricting Subsets of Bases in Relatively Free Groups* (with L. Sabalka), to appear in IJAC, 2011, <http://arxiv.org/abs/1103.2992>

Reports

10. *About classification of groups generated by automata with three states over an alphabet with two letters, and about some questions concerning these groups* (with I. Bondarenko, R. Grigorchuk, R. Kravchenko, Y. Muntyan, V. Nekrashevych and Z. Sunic), Bulletin of Chernivtsi National University, Mathematics V.336–337 (2007), 29–39

Preprints

11. *On the geometry of a proposed curve complex analogue for $Out(F_n)$* (with L. Sabalka), submitted, 2011, 23 pages, <http://arxiv.org/abs/1007.1998>
12. *Schreier graphs of actions of Thompson's group F on the unit interval and on the Cantor set*, preprint, 2011, 18 pages, <http://arxiv.org/abs/1105.4017>

In Preparation

13. *Groups generated by 3-state 2-letter automata that act essentially freely on the boundary of the tree* (with R. Grigorchuk)
14. *Submanifold Projection for $Out(F_n)$* (with M. Clay and L. Sabalka)
15. *A family of graphs of intermediate growth whose incidence relation is accepted by finite automaton* (with A. Miasnikov)

Undergraduate Exposition

16. (with N. Rudomino-Dusyatska) *Is gambling worth it?* (Ukrainian), In the world of Mathematics, V.5 (1999), no.3, 77–82
17. (with N. Rudomino-Dusyatska) *About D. Grave and some of his works on probability theory*, Abstracts of the Third Ukrainian-Scandinavian Conference in Probability Theory and Mathematical Statistics. June 8-12, 1999, Kyiv, Ukraine
18. *Projecting points on the exponent* (Ukrainian), In the world of Mathematics, V.4 (1998), no.4, 26–32
19. *Nobel Prize and Mathematicians* (Ukrainian), In the world of Mathematics, V.3 (1997), no.4, 62–64

SOFTWARE

- Package AutomGrp V.1.1.4 for GAP system for computations in groups and semigroups generated by automata (joint with Y. Muntyan),
<http://www.gap-system.org/Packages/automgrp.html>

SELECTED TALKS

Conference Talks

- Jan 2012** (invited, 2 talks) *AMS Joint Meeting*, Boston, MA
- Oct 2011** (invited) *AMS Sectional Meeting #1075*, Salt Lake City, UT
- Oct 2011** (invited) *AMS Sectional Meeting #1074*, Lincoln, NE
- Mar 2011** (invited) *Spring Topology and Dynamics Conference*, University of Texas at Tyler, Tyler, TX
- Dec 2010** (invited) *Second Manhattan Group Theory Day*, Graduate Center, CUNY
- May 2010** (invited) *AMS Sectional Meeting #1060*, Newark, NJ
- Oct 2008** (invited) *AMS Fall Central Sectional Meeting #1043*, Kalamazoo, MI

- Oct 2008** (invited) *Self-similarity and Branching in Group Theory Workshop*,
Banff International Research Station, Banff, Alberta, Canada
- Aug 2008** *Computational Group Theory and Cohomology*,
Grantham, United Kingdom
- Jul 2008** (invited) *Group theory and complexity*,
Steklov Mathematical Institute, Moscow, Russia
- Jul 2008** (invited) *Groups generated by automata and related questions*,
National Taras Shevchenko University of Kyiv, Ukraine
- Dec 2007** (invited) *Fields Workshop in Asymptotic Group Theory and Cryptography*,
Carleton University, Canada
- Jul 2007** *Groups and their actions*,
Bedlewo, Poland
- Jan 2007** *Geometric Groups on the Gulf Coast*,
New Orleans, LA
- Jul 2006** (invited) *Algebra, Topology, Functional and Stochastic Analysis*,
Koziova, Ukraine
- May 2006** *The 10-th Midrasha Mathematicae in: "Asymptotic Group Theory"*,
The Hebrew University of Jerusalem, The Institute for Advanced Studies
- Jul 2005** (invited) *5-th International Algebraic Conference in Ukraine*,
Odessa I.I. Mechnikov National University, Odessa, Ukraine
- Jun 2005** *Geometric and Asymptotic Methods in Group Theory Workshop*,
Banff International Research Station, Banff, Alberta, Canada
- Nov 2004** *Asymptotic Group Invariants and their Applications Workshop*,
Texas A&M University, College Station, TX
- Jul 2004** *Advanced Course on Automata Groups*,
Centre de Recerca Matemàtica, Barcelona, Spain

Seminar Talks

- Jan 2012** *Algebra Colloquium*, Graduate Center, City University of New York
- Jan 2012** *Colloquium*, Bowling Green State University, Ohio
- Nov 2011** *Geometry & Topology seminar*, Graduate Center, City University of New York
- Mar 2011** *Topology/Geometry seminar*, Yale University
- Mar 2011** *Algebra Seminar*, Carleton University, Canada
- Nov 2010** *Groups and Dynamics Seminar*, Texas A&M University
- Nov 2010** *Geometry & Topology seminar*, Binghamton University
- May 2010** *Group Theory International Webinar*, hosted by Stevens institute of technology
- Mar 2010** *Geometry & Topology seminar*, Binghamton University
- Mar 2010** *Algebra seminar*, Binghamton University
- Oct 2009** *Baumslag Seminar*, Graduate Center, City University of New York
- Nov 2009** *Topology & Geometric Group Theory Seminar*, Cornell University
- Sep 2009** *Geometry & Topology seminar*, Binghamton University (2 talks)
- Feb 2009** *Colloquium*, Binghamton University

Talks for Students

- Oct 2011** “*Open Key Cryptography and how RSA works*”,
Undergraduate Math Club, Binghamton University
- May 2011** “*Lickorish-Wallace theorem on 3-manifolds*”,
Toeholds in Topology Graduate seminar, Binghamton University
- Sep 2010** “*Asymptotic dimension of spaces and groups I, II*”,
Toeholds in Topology Graduate seminar, Binghamton University (2 talks)
- Feb 2010** “*What are the fractals and where do we see them*”,
Undergraduate Math Club, Binghamton University
- Oct 2009** “*Introduction to the world of groups*”,
Undergraduate Math Club, Binghamton University
- Sep 2009** “*Introduction to groups generated by automata I, II*”,
Toeholds in Topology Graduate seminar, Binghamton University (2 talks)
- Oct 2006** “*Automata groups from different points of view*”,
Graduate Student Seminar, Texas A&M University

TEACHING

Binghamton University

- Math 130 *Mathematics in Action*
Spring 2011 (250 students), Fall 2011 (280 students)
- Math 304 *Linear Algebra*
Fall 2009 (44 students), Fall 2010 (50 students)
- Math 330 *Number Systems*
Spring 2010 (25 students)
- Math 371 *Ordinary Differential Equations*
Fall 2009 (40 students)
- Math 372 *Dynamical Systems*
Fall 2010 (36 students)
- Math 375 *Complex Variables*
Spring 2012 (scheduled)
- Math 461 *Topology I*
Fall 2011 (21 students)

Texas A&M University

- Math 142 *Business Mathematics II*
Instructor (Summer 2006)
- Math 152 *Calculus II (with Maple[®])*
Teacher Assistant (Fall 2007 (honors), Spring 2007, Fall 2005)
- Math 253 *Calculus III (with Maple[®])*
Teacher Assistant (Fall 2006 (honors), Spring 2005)

Grader for the following courses:

- Math 166 *Topics in Contemporary Mathematics II*
- Math 308 *Differential Equations*
- Math 367 *Basic Concepts of Geometry*
- Math 414 *Fourier Series and Wavelets*
- Math 416 *Modern Algebra II*
- Math 433 *Applied Algebra*
- Math 645 *A Survey of Mathematical Problems I*
- Math 662 *Applied Algebra (Graduate Course)*

Kyiv Taras Shevchenko University, Ukraine

- Abstract Algebra*
Teacher Assistant (Spring 2002)

SERVICE

- Referee for the following journals:
 - Theoretical Computer Science
 - International Journal of Algebra and Computation
 - Semigroup Forum
 - European Journal of Combinatorics
- Reviewer for Mathscinet (since 06/2006, 18 papers reviewed)
- Co-organizer of Geometry and Topology seminar at Binghamton University
- Co-organizer of Toeholds in Topology seminar for graduate students at Binghamton University
- Advisor of Undergraduate Math Club at Binghamton University
- Chapter Advisor for Pi Mu Epsilon Honor Society

AWARDS

- Soros Fellowship for Undergraduate Students, Kyiv, Ukraine 1998
- Ostrogradsky Prize for Researches of Ukrainian University Students at the Institute of Mathematics of the NASU, Kyiv, Ukraine 2001

PROFESSIONAL MEMBERSHIPS

- American Mathematical Society

SKILLS

Languages Ukrainian and Russian (native), English (fluent)

Computer I have experience working and programming in different Computer Algebra Systems, including **GAP**, Maple[®], R
Proficient in publishing scientific documents with $\text{L}^{\text{A}}\text{T}_{\text{E}}\text{X}$

REFERENCES

Ross Geoghegan Binghamton University, ross@math.binghamton.edu

Rostislav Grigorchuk Texas A&M University, grigorch@math.tamu.edu

Luise-Charlotte Kappe Binghamton University, menger@math.binghamton.edu (teaching)

Alexei Miasnikov Stevens Institute of Technology, amiasnik@stevens.edu

Volodymyr Nekrashevych Texas A&M University, nekrash@math.tamu.edu

Mark Sapir Vanderbilt University, m.sapir@vanderbilt.edu

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Philip Yasskin Texas A&M University, yasskin@math.tamu.edu (teaching)