

Alec Mihailovs

Department of Mathematics
Tennessee Tech University
Cookeville, TN 38505

Office phone (931) 372-3622
Home phone (931) 372-7503
Email Alec@Mihailovs.com
<http://math.tntech.edu/alec/>

EMPLOYMENT

- 2004–present* *Assistant Professor, Tennessee Tech University*
Taught Intro to Math, Calculus I, II, III, Calculus I Honors Seminar, Differential Equations, Linear Algebra, Linear Algebra Lab, Combinatorics, Graph Theory, Senior Seminar, Modern Algebra I and Abstract Algebra I (Math 6110, a graduate course).
- 1999–2004* *Assistant Professor, Shepherd University*
Taught Introduction to Mathematics, College Algebra, Finite Mathematics, Discrete Mathematics, Calculus I, II, III, Differential Equations, Abstract Algebra, Numerical Analysis, Statistics, Probability and Statistics, Digital Logic Design, Senior Capstone Practicum, and Seminar in Problem Solving. Last 3 years was a member of the Shepherd University Faculty Senate, 2 years the chair of the Shepherd University Computing Services Committee, and a member of the Shepherd University Technology Oversight Committee.
- 1998–1999* *Lecturer, SUNY College at Oneonta*
Taught Introduction to Computing Technology, Introduction to Mathematical Thought, Calculus I, II, Elementary Differential Equations, and Topics in Differential Geometry (Math 637, a graduate course).
- 1996–1998* *Lecturer and Teaching Assistant, University of Pennsylvania*
Taught Math 240 (Calculus III). Assisted in teaching of Math 240, Math 350 (Number Theory), Math 170 (Ideas in Mathematics), as well as two graduate courses, Math 600 (Geometric Analysis & Topology) and Math 602 (Algebra).

EDUCATION

- 1996–1998* PhD in Mathematics, University of Pennsylvania
1994–1995 Master in Mathematics, University of Latvia
1994–1995 Bachelor in Mathematics, University of Latvia
1972–1978 Moscow State University

RESEARCH

Past research interests were mainly in Representation Theory, Invariant Theory, Combinatorics and Number Theory. Currently I am most interested in the development of a combinatorial approach to the Representation Theory. I described the bases of the tensor invariants of $SL(n)$, $Sp(2n)$, $SO(2n+1)$, and G_2 using wave graphs generalizing the non-intersecting arcs theory for $SL(2)$. Found formulas for the counting of random walks on Schur operations on lattices. For the weight lattices in Weyl chambers, they give the formulas for dimensions of tensor invariants. Also, I studied diagrams of representations and their applications to representations of unipotent Lie groups and nilpotent Lie algebras and to obtaining explicit formulas for fractional residues. Recently I found a way to apply the orbit method to finite groups.

SELECTED PUBLICATIONS

1. ALEC MIHAILOVS. *A Combinatorial Approach to Representations of Lie Groups and Algebras*, Springer-Verlag New York (2005). 352 pages, ISBN: 0-8176-4251-X.
2. W. EDWIN CLARK, XIANG-DONG HOU, ALEC MIHAILOVS. The Affinity of a Permutation of a Finite Vector Space, *Finite Fields and Their Applications* (accepted) (2005), math.CO/0407148. TTU Department of Mathematics Tech. Report No. 2004-3. 25 pages.
3. ALEC MIHAILOVS. Writing DLL in Assembler for External Calling in Maple (2004). TTU Department of Mathematics Tech. Report No. 2004-5. *Maple Application Center*. 17 pages.
4. ALEC MIHAILOVS. Maple Programs for Binary Tensor Invariants and Outerplanar Graphs. Preprint (2002). 68 pages.
5. ALEC MIHAILOVS, MIKE MAY, S. J. *Abstract Algebra*. Maple PowerTool (2002).
6. ALEC MIHAILOVS. *Abstract Algebra with Maple* (2002). 42 pages. Supplement to J. A. GALLIAN, *Contemporary Abstract Algebra*, 5th ed., Houghton Mifflin (2002).
7. ALEC MIHAILOVS. The Orbit Method for Finite Groups of Nilpotency Class Two of Odd Order, math.RT/0001092 (2000). 16 pages.
8. ALEC MIHAILOVS. *A Combinatorial Approach to Representations of Lie Groups and Algebras*. Ph.D. thesis, University of Pennsylvania, 1998. 134+vii pages.
9. ALEC MIHAILOVS. Enumeration of walks on lattices. I, math.CO/9803128 (1998). 37 pages.
10. ALEC MIHAILOVS. Symplectic tensor invariants, wave graphs and S-tris, math.RT/9803102 (1998). 16 pages.
11. ALEC MIHAILOVS. Diagrams of representations, math.RT/9803079 (1998). 19 pages.
12. ALEC MIHAILOVS. Fractional residues, math.RT/9803018 (1998). 17 pages.
13. ALEC MIHAILOVS. Tensor invariants of $SL(n)$, wave graphs and L-tris, math.RT/9802119 (1998). 8 pages.
14. ALEC MIHAILOVS. Tensor decompositions for $SL(2)$ and outerplanar graphs, math.RT/9712259 (1997). 21 pages. Accepted for publication by *Journal of Combinatorial Theory, Series A*.
15. ALEC MIHAILOVS. Tensor invariants of $SL(2)$ and outerplanar graphs. Preprint (1997). 7 pages.
16. ALEC MIHAILOVS. Weights and roots. Preprint (1997). 5 pages.
17. ALEC MIHAILOVS. *The Petrovsky Numbers and Multiplicities of Representations*. Masters thesis, University of Latvia (1995). 50 pages.
18. ALEC MIHAILOVS. *Lucky Tickets and the Petrovsky Numbers*. Bachelors thesis, University of Latvia (1995). 50 pages.
19. ALEC MIHAILOVS. On the log-concavity, *Kvant* 11/12 (1993), p. 1–9 (in Russian).
20. ALEC MIHAILOVS. WWW sites <http://mihailovs.com/Alec/>, <http://math.tntech.edu/alec/>, <http://webpages.shepherd.edu/amihailo/> and others (1996 – present).

SERVICE

- A moderator of 4 international mailing lists, `maple-expert`, `maple-new`, `maple8`, and `maple-assist`, July 2002–present.
- The PEW MathSciNet Consortium coordinator, 2002–2003.
- A member of the Shepherd University Faculty Senate, May 2001–2004.
- The chair of the Shepherd University Computing Services Committee, 2001–2003.
- A member of the Shepherd University Technology Oversight Committee, 2001–2003.
- Organizer of the Shepherd University Problem of the Week, the Shepherd University Math Contest for High School Students, and local sessions of Virginia Tech Math Contest and Putnam, August 1999–2004.

GRANTS AND AWARDS

- 5 Maplesoft Software and Books Awards, 2001–2005.
- Dunlop Instrumental Grant, Fall 2002.
- Conard Summer Research Stipend, Summer 2002.
- Office of Naval Research Grant N00014-97-1-0505, Spring 1998.
- University of Pennsylvania Fellowship, Spring 1998.
- University of Pennsylvania Teaching Assistantship, 1996–1997 (4 terms).
- University of Latvia Scholarship, 1994–1995.
- 1st place in the Latvian Mathematics Olympiads (4 times) and Bronze Medals (twice) in the Soviet Union Mathematics Olympiads, 1968–1972.

COMPUTER SKILLS

- \LaTeX – expert level. In particular, produced a \LaTeX package, `rumik.zip` (886 KB) for the Cyrillization of MiKTeX .
- Maple – expert level. A moderator of 4 international Maple mailing lists. Together with Fr Mike May, S.J. wrote the Abstract Algebra Maple PowerTool [5]. A series of Maple programs can be found on my web pages [20].
- Web development – expert level.
- Programming – program in C, C++, C#, Java, Javascript, VB, VBscript, SQL, PC assembler, Perl, and a few other languages for many years.

PERSONAL

- A member of the AMS and MAA, 1996–present.
- A citizen of the United States.