CURRICULUM VITAE – SASHA RUBIN

PERSONAL INFORMATION

Sasha Rubin
IST Austria
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POSTDOCTORAL

Postdoctoral Researcer (3.2012 – present)
IST Austria and TU Vienna, Austria.

Visiting Lecturer (2.2010 – 5.2010)
Department of Mathematics, University of Cape Town.

Visiting Assistant Professor (08.2008 – 12.2009)
Department of Mathematics, Cornell University.

Honorary Research Fellow (12.2005 – 02.2008)
Department of Computer Science, University of Auckland.
Zealand Science and Technology Postdoctoral Fellowship.

PH.D.

Mathematics and Computer Science (2004)
University of Auckland, New Zealand.
Supervisor: Bakhadyr Khoussainov
Thesis Title: Automatic Structures

Vice-chancellor's prize for the best doctoral thesis in the Faculty of Science.

Montgomery memorial prize in logic from the Department of Philosophy.

RESEARCH INTERESTS I study the power of automata theory and mathematical logic for describing mathematical structures. Concretely, I have worked in the areas of automatic structures, formal verification, and finite model theory. I am currently working on the analysis of distributed systems and distributed algorithms using logical and automata-theoretic methods.

RECENT INVITED TALKS

Workshop on *Finite and Algorithmic Model Theory* Les Houches (05.2012)
Workshop on *Automata theory and Applications* IMS programme, Singapore (09.2011)
Annual meeting of CNRS SIG on *Computational Model Theory* Bordeaux (06.2008)
Workshop *Algorithmic-Logical Theory of Infinite Structures* Dagstuhl (10.2007)
Newton Institute workshop on *Finite and Algorithmic Model Theory* Durham (01.2006)

RECENT RESEARCH VISITS

Łukasz Kaiser, Université Paris Diderot, Paris (10.2011)
Aniello Murano, Università degli Studi di Napoli Federico II. (08.2011).
Alexander Rabinovich, Tel Aviv University (5.2011 – 8.2011)

Journals

Journal of Symbolic Logic, Logical Methods in Computer Science, Central European Journal of Mathematics, Information and Computation, Journal of Logic and Computation, Theory and Practice of Logic Programming, Handbook of Model Checking

Conferences

LICS, STACS, FoSSaCS, FSTTCS, CSL, CiE, LATA

PUBLICATIONS (18)

Book chapters

Automatic Structures in *Automata: From mathematics to applications*, J.E. Pin, Ed., to be published by EMS.

Automata based presentations of infinite structures with V. Bárány and E. Grädel, in *Finite and Algorithmic Model Theory*, J. Esparza, C. Michaux, and C. Steinhorn, Eds., Series: London Mathematical Society Lecture Note Series (No. 379), $1 - 76$, 2011.

LICS Proceedings

Interpretations in trees with countably many branches with A. Rabinovich, $551 - 560$, 2012.

Automatic Structures: Richness and Limitations, with B. Khoussainov, A. Nies and F. Stephan, $44 - 53$, 2004.

Automatic Partial Orders, with B. Khoussainov and F. Stephan, $168 - 177$, 2003.

Some Results on Automatic Structures, with B. Khoussainov and H. Ishihara, $235 - 244$, 2002.

STACS Proceedings

Cardinality and counting quantifiers on omega-automatic structures, with V. Bárány and Ł. Kaiser, $385 - 396$, 2008.

Order invariant MSO is stronger than counting MSO, with T. Ganzow, $313 - 324$, 2008.

Definability and Regularity in Automatic Structures, with B. Khoussainov and F. Stephan, $440 - 451$, 2004.

CAV Proceedings

Verifying ω-regular Properties of Markov Chains, with D. Bustan and M. Vardi, $189 - 201$, 2004.

Other conferences

A Myhill-Nerode Theorem for Automata with Advice with A. Kruckman, J. Sheridan and B. Zax, *GandALF 2012*.

Journals

Alternating Traps in Parity Games with P. Phalitnonkiat, A. Grinshpun, A.Tarfulea, accepted to *Theoretical Computer Science*.

Automata presenting structures: A survey of the finite-string case, The Bulletin of Symbolic Logic, Volume 14, Issue 2, 2008, 169-209.

Automatic Structures: Richness and Limitations, with B. Khoussainov, A. Nies and F. Stephan, Logical Methods in Computer Science, Vol 3, 2007.

Automatic linear orders and trees, with B. Khoussainov and F. Stephan, ACM Transactions on Computational Logic, $6(4), 675 - 700, 2005$.

Automatic Structures - Overview and Future Directions, with B. Khoussainov, Journal of Automata, Languages and Combinatorics, $8(2), 287 - 301, 2003$.

Graphs with Automatic Presentations over a Unary Alphabet Journal of Automata, Languages and Combinatorics, $6(4), 467 - 480, 2001$.

Finite Automata and Well Ordered Sets, New Zealand Journal of Computing, $7(2), 39 - 46, 1999$.

TEACHING PHILOSOPHY

The only way to absorb mathematics is to do mathematics. My goal as a teacher is to guide students through the material, show them why it is relevant, and help them think deeply and carefully.

I discuss teaching strategies with colleagues, and typically I reflect after my lectures, eg. is there a better way of breaking the material into chunks to help students follow? I notice that students are sensitive to the wording I use, and so I keep a list of phrases to which they respond, eg. 'can anyone help A with her answer?', 'can you explain B's idea to me?', 'what do you mean by X?', 'are you sure?', 'who will summarise today's class?', 'if all I do is teach you skills I'm short-changing you'.

SUPERVISION AND TEACHING

Supervision

Ongoing Ph.D. project
Topic: Synthesis of distributed.
IST Austria

Summer undergraduate project
Topic: Edit distance between languages.
IST Austria. 2012

Summer research experience for undergraduates
Topic 1: Parity games.
Topic 2: Automatic Structures in the presence of advice.
Cornell University, Department of Mathematics, 2009

Teaching

Logical definability and random graphs (graduate)
Cornell University, Department of Mathematics, 2009

Logic and Computation (undergraduate)
University of Cape Town, Department of Mathematics, 2010

Calculus for Engineers (undergraduate)
Cornell University, Department of Mathematics, $2008 - 2009$

Discrete Structures in Mathematics and Computer Science (undergraduate)
Mathematical Foundations of Software Engineering (undergraduate)

University of Auckland, Department of Computer Science, 2007

Logic and computation in finitely presentable infinite structures (five day advanced course)
18*th European Summer School in Logic, Language and Information, Malaga*
with V. Goranko, 2006

ACADEMIC
REFERENCES

Erich Grädel
Mathematische Grundlagen der Informatik
RWTH Aachen, Germany
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Bakhadyr Khoussainov
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TEACHING
REFERENCES

Maria Terrell
Director of Teaching Assistant Programs
Cornell University, USA
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David Way
Director of Instructional Support Center for Teaching Excellence
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