Curriculum Vitae

Achim Blumensath
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Education

Habilitation in Mathematics, TU Darmstadt, 2008.
Thesis: *Simple Monadic Theories*

PhD in Mathematics, RWTH Aachen, 2003.
Thesis: *Structures of Bounded Partition Width.*
Advisor: Prof. Erich Grädel

Diploma in Computer Science, RWTH Aachen, 1999.
Thesis: *Automatic Structures.*
Advisor: Prof. Erich Grädel

Employment

since April 2011	Postdoc position at Université Paris 7
2005-2011	Assistant position at TU Darmstadt
2004	Postdoc position at Université Bordeaux 1
2000–2003	PhD student position at RWTH Aachen
1997–1999	various occupations as tutor or teaching assistant

Research Projects and Grants

2008	*Algebraic Characterisations of Regular ω-Tree Languages,* ESF AutoMathA – Short Visit Grant (principal researcher).
2004	*Games and Automata for Synthesis and Validation,* EU Research and Training Network (post-doctoral research assistant).
2000–2003	*Computational Model Theory,* Deutsche Forschungsgemeinschaft (DFG), RWTH Aachen (research assistant; principal researcher: Prof. Erich Grädel).

Research Interests

(a) Computational and algorithmic model theory, finite model theory.

(b) Model theory for monadic second-order logic.

(c) Automata theory and algebraic language theory.

(d) Graph theory and combinatorics.

(e) Model checking and verification, decision procedures for fixed-point logics and fragments of second-order logic.

Teaching Experience

For the last eight years I have been responsible for tutorials, exercises, and seminars, mostly on undergraduate mathematics, on mathematical logic, and on its applications in computer science. In addition I taught some courses of my own:

summer term 2003	Model Theory
summer term 2005	The Monadic Second-Order Theory of Graphs
winter term 2007/2008	Non-Classical Model Theory
winter term 2008/2009	Graph Theory
summer term 2009	Formal Foundations of Computer Science 1
summer term 2010	Logic and Foundations

The last two are undergraduate courses, while the others are advanced courses. As is typically the case in the German system, these lecture courses were individually and independently developed. Three of the courses where subject to a quality evaluation with respectable results.

Supervised Theses

[1] Daniel Günzel, *The Transduction Hierarchy for Infinite Structures,* Bachelor Thesis, 2010.

Publications

Unpublished papers

[U1] *Logic and Algebra,* book in preparation. A draft is available at www.mathematik.tu-darmstadt.de/~blumensath

[U2] (with Martin Otto and Mark Weyer) *Decidability Results for the Boundedness Problem,* in preparation.

[U3] *An Algebraic Proof of Rabin's Tree Theorem,* in preparation.

Journal articles

[J1] *Recognisability for Algebras of Infinite Trees,* Theoretical Computer Science, to appear.

[J2] *Simple Monadic Theories and Partition Width,* Mathematical Logic Quarterly, to appear.

[J3] *Locality and Modular Ehrenfeucht-Fraïssé Games,* Journal of Applied Logic, to appear.

[J4] *Simple Monadic Theories and Indiscernibles,* Mathematical Logic Quarterly, 57 (2011), pp. 65-86.

[J5] (with Bruno Courcelle) *The Monadic Second-Order Transduction Hierarchy,* Logical Methods in Computer Science, 6 (2010).

[J6] *Guarded Second-Order Logic, Spanning Trees, and Network Flows,* Logical Methods in Computer Science, 6 (2010).

[J7] *On the Structure of Graphs in the Caucal Hierarchy,* Theoretical Computer Science, 400 (2008), pp. 19–45.

[J8] (with Bruno Courcelle) *Recognizability, Hypergraph Operations, and Logical Types,* Information and Computation, 204 (2006), pp. 853–919.

[J9] *A Model Theoretic Characterisation of Clique-Width,* Annals of Pure and Applied Logic, 142 (2006), pp. 321–350.

[J10] (with Stephan Kreutzer) *An Extension to Muchnik's Theorem,* Journal of Logic and Computation, 15 (2005), pp. 59–74.

[J11] (with Erich Grädel) *Finite Presentations of Infinite Structures: Automata and Interpretations,* Theory of Computing Systems, 37 (2004), pp. 641–674.

[J12] *Axiomatising tree-interpretable structures,* Theory of Computing Systems, 37 (2004), pp. 3–27.

Handbook chapters

[H1] (with Thomas Colcombet and Christof Löding) *Logical theories and compatible operations,* in Logic and Automata (J. Flum, E. Grädel, T. Wilke, eds.), Amsterdam University Press, 2007, pp. 72–106.

[H2] (with Dietmar Berwanger) *The Monadic Theory of Tree-like Structures,* in Automata, Logic, and Infinite Games (E. Grädel, W. Thomas, T. Wilke, eds.), LNCS 2500 (2002), pp. 285–301.

[H3] (with Dietmar Berwanger) *Automata for Guarded Fixed Point Logics,* in Automata, Logic, and Infinite Games (E. Grädel, W. Thomas, T. Wilke, eds.), LNCS 2500 (2002), pp. 343–355.

Papers in refereed conferences

[C1] (with Martin Otto and Mark Weyer) *Boundedness of Monadic Second-Order Formulae Over Finite Words,* ICALP, LNCS 5556 (2009), pp. 67–78.

[C2] (with Erich Grädel) *Finite Presentations of Infinite Structures: Automata and Interpretations,* Proc. 2nd Int. Workshop on Complexity in Automated Deduction, CiAD 2002.

[C3] *Axiomatising tree-interpretable structures,* Proc. 19th Int. Symp. on Theoretical Aspects of Computer Science, LNCS 2285 (2002), pp. 596–607.

[C4] *Bounded Arithmetic and Descriptive Complexity,* Proc. 14th Ann. Conference of the European Association for Computer Science Logic, LNCS 1862 (2000), pp. 232–246.

[C5] (with Erich Grädel) *Automatic Structures,* Proc. 15th IEEE Symp. on Logic in Computer Science, 2000, pp. 51–62.

Theses

[T1] *Simple Monadic Theories,* Habilitation Thesis, TU Darmstadt, 2008.

[T2] *Structures of Bounded Partition Width,* Ph.D. Thesis, RWTH Aachen, 2003.

[T3] *Automatic Structures,* Diploma Thesis, RWTH Aachen, 1999.

Preprints of all my papers are available from:

http://www.mathematik.tu-darmstadt.de/~blumensath/Publications.html

Invited Talks

Invited talks at conferences and workshops

[1] *Automata, Logic, and Infinite Games,* Dagstuhl, 2001.

[2] *Workshop on Automata, Structures and Logic,* Auckland, 2004.

[3] *Finitely Represented Infinite Graphs,* Rennes, 2005.

[4] *Logic and Combinatorics,* Szeged, 2006.

[5] *Algorithmic-Logical Theory of Infinite Structures,* Dagstuhl, 2007.

[6] *Logic and Algorithms,* Edinburgh, 2008.

[7] *ASL Winter Meeting, Special Session on Model Theoretic Methods in Finite Combinatorics,* Washington, 2009.

[8] *Higher-Order Recursion Schemes & Pushdown Automata,* Paris, 2010.

[9] *Logic, Combinatorics and Computation,* Brno, 2010.

[10] *Journées Complexité et Modèles Finis,* Paris, 2011.

Invited lectures and stays at universities

[1] University of Dresden, 2003.

[2] University of Paris 7, 2008.

[3] RWTH Aachen, 2008.

[4] Université Bordeaux 1, 2009.

[5] Kurt Gödel Research Center, Vienna, 2011.

Programme committees

I was member of the programme committees of the following conferences:

[1] ICLA 2011

Other academic engagements and activities

I am serving as an accountant for the EACSL.
I act as referee for journals and conferences, as illustrated by the (incomplete) listings below.

Refereeing for journals: Journal of Symbolic Logic, Logical Methods in Computer Science, ACM Transactions on Computational Logic, Discrete Mathematics, Discrete Applied Mathematics, Information and Computation, Transactions on Database Systems, Fundamenta Informaticae, Theoretical Computer Science.

Refereeing for conferences: Logic in Computer Science LICS, Computer Science Logic CSL, International Colloquium on Automata, Languages and Programming ICALP, Foundations of Software Technology and Theoretical Computer Science FSTTCS, Symposium on Theoretical Aspects of Computer Science STACS.