

# Ralf Wimmer's Publications

December 12, 2011

## Journal Publications

- [1] Eckard Böde, Marc Herbstritt, Holger Hermanns, Sven Johr, Thomas Peikenkamp, Reza Pulungan, Jan Rakow, Ralf Wimmer, and Bernd Becker. Compositional dependability evaluation for STATEMATE. *IEEE Transactions on Software Engineering*, 35(2):274–292, 2009.
- [2] Ralf Wimmer, Salem Derisavi, and Holger Hermanns. Symbolic partition refinement with automatic balancing of time and space. *Performance Evaluation*, 67(9):815–835, 2010.

## Refereed Conference and Workshop Publications

- [1] Bernd Becker, Markus Behle, Friedrich Eisenbrand, Martin Fränzle, Marc Herbstritt, Christian Herde, Jörg Hoffmann, Daniel Kröning, Bernhard Nebel, Ilia Polian, and Ralf Wimmer. Bounded model checking and inductive verification of hybrid discrete-continuous systems. In *Proceedings of the 7<sup>th</sup> ITG/GI/GMM-Workshop “Methoden und Beschreibungssprachen zur Modellierung und Verifikation von Schaltungen und Systemen” (MBMV)*, pages 65–75. Shaker Verlag, 2004.
- [2] Bernd Becker, Markus Behle, Friedrich Eisenbrand, and Ralf Wimmer. BDDs in a branch & cut framework. In Sotiris E. Nikolettseas, editor, *Proceedings of the 4<sup>th</sup> International Workshop on Efficient and Experimental Algorithms (WEA)*, volume 3503 of *Lecture Notes in Computer Science*, pages 452–463, Santorini, Greece, May 2005. Springer-Verlag.
- [3] Ralf Wimmer, Marc Herbstritt, and Bernd Becker. Minimization of large state spaces using symbolic branching bisimulation. In Matteo Sonza Reorda, Ondřej Novák, Bernd Straube, Hana Kubátová, Zdeněk Kotásek, Pavel Kubalík, Raimund Ubar, and Jiří Bucek, editors, *Proceedings of the 9<sup>th</sup> IEEE International Workshop on Design & Diagnostics of Electronic Circuits & Systems (DDECS)*, pages 9–14, Prague, Czech Republic, April 2006. IEEE Computer Society Press.

- [4] Eckard Böde, Marc Herbstritt, Holger Hermanns, Sven Johr, Thomas Peikenkamp, Reza Pulungan, Ralf Wimmer, and Bernd Becker. Compositional performability evaluation for Statemate. In Gianfranco Ciardo, editor, *Proceedings of the 3<sup>rd</sup> International Conference on Quantitative Evaluation of Systems (QEST)*, Riverside, California, USA, September 2006. IEEE Computer Society Press.
- [5] Ralf Wimmer, Marc Herbstritt, Holger Hermanns, Kelley Strampp, and Bernd Becker. Sigref – A symbolic bisimulation tool box. In Susanne Graf and Wenhui Zhang, editors, *Proceedings of the 4<sup>th</sup> International Symposium on Automated Technology for Verification and Analysis (ATVA)*, volume 4218 of *Lecture Notes in Computer Science*, pages 477–492, Beijing, China, October 2006. Springer-Verlag.
- [6] Ralf Wimmer, Tobias Nopper, Marc Herbstritt, Christoph Löffler, and Bernd Becker. Collaborative exercise management. In Thomas C. Reeves and Shirley F. Yamashita, editors, *Proceedings of the 11<sup>th</sup> World Conference on E-Learning in Corporate, Government, Health Care, & Higher Education (E-Learn)*, Honolulu, Hawaii, USA, October 2006. Association for the Advancement of Computers in Education (AACE).
- [7] Ralf Wimmer, Marc Herbstritt, and Bernd Becker. Optimization techniques for BDD-based bisimulation minimization. In Hai Zhou and Enrico Macii, editors, *Proceedings of the 17<sup>th</sup> ACM Great Lakes Symposium on VLSI (GLSVLSI)*, pages 405–410, Stresa, Italy, March 2007. ACM Press.
- [8] Ralf Wimmer, Marc Herbstritt, and Bernd Becker. Forwarding, splitting, and block ordering to optimize BDD-based bisimulation computation. In Christian Haubelt and Jürgen Teich, editors, *Proceedings of the 10<sup>th</sup> GI/ITG/GMM-Workshop “Methoden und Beschreibungssprachen zur Modellierung und Verifikation von Schaltungen und Systemen” (MBMV)*, pages 203–212, Erlangen, Germany, March 2007. Shaker Verlag.
- [9] Ralf Wimmer, Alexander Kortus, Marc Herbstritt, and Bernd Becker. The demand for reliability in probabilistic verification. In Christoph Scholl and Stefan Disch, editors, *Proceedings of the 11<sup>th</sup> GI/ITG/GMM-Workshop “Methoden und Beschreibungssprachen zur Modellierung und Verifikation von Schaltungen und Systemen” (MBMV)*, pages 99–108, Freiburg im Breisgau, Germany, March 2008. Shaker Verlag.
- [10] Ralf Wimmer, Alexander Kortus, Marc Herbstritt, and Bernd Becker. Probabilistic model checking and reliability of results. In Bernd Straube, Miloš Drutarovský, Michel Renovell, Peter Gramata, and Mária Fischerová, editors, *Proceedings of the 11<sup>th</sup> IEEE International Workshop on Design and Diagnostics of Electronic Circuits and Systems (DDECS)*, pages 207–212, Bratislava, Slovakia, April 2008. IEEE Computer Society Press.
- [11] Ralf Wimmer, Salem Derisavi, and Holger Hermanns. Symbolic partition refinement with dynamic balancing of time and space. In Gerardo Rubino, editor, *Proceedings*

- of the 5<sup>th</sup> International Conference on Quantitative Evaluation of Systems (QEST), pages 65–74, Saint-Malo, France, September 2008. IEEE Computer Society Press.
- [12] Bernd Becker, Marc Herbstritt, Natalia Kalinnik, Matthew Lewis, Juri Lichtner, Tobias Nopper, and Ralf Wimmer. Propositional approximations for bounded model checking of partial circuit designs. In *Proceedings of the 26<sup>th</sup> IEEE International Conference on Computer Design (ICCD)*, pages 52–59, Resort at Squaw Creek, Lake Tahoe, California, USA, October 2008. IEEE Computer Society Press.
- [13] Ralf Wimmer, Bettina Braitling, and Bernd Becker. Counterexample generation for discrete-time Markov chains using bounded model checking. In Neil D. Jones and Markus Müller-Olm, editors, *Proceedings of the 10<sup>th</sup> International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI)*, number 5403 in *Lecture Notes in Computer Science*, pages 366–380, Savannah, Georgia, USA, January 2009. Springer-Verlag.
- [14] Natalia Kalinnik, Tobias Schubert, Erika Ábrahám, Ralf Wimmer, and Bernd Becker. Picoso – A parallel interval constraint solver. In Hamid R. Arabnia, editor, *Proceedings of the International Conference on Parallel and Distributed Processing Techniques and Applications (PDPTA)*, pages 473–479, Las Vegas, Nevada, USA, July 2009. CSREA Press.
- [15] Abhishek Dhama, Oliver Theel, Pepijn Crouzen, Holger Hermanns, Ralf Wimmer, and Bernd Becker. Dependability engineering of silent self-stabilizing systems. In Rachid Guerraoui and Franck Petit, editors, *Proceedings of the 11<sup>th</sup> International Symposium on Stabilization, Safety, and Security of Distributed Systems (SSS)*, volume 5873 of *Lecture Notes in Computer Science*, pages 238–253, Lyon, France, November 2009. Springer-Verlag.
- [16] Natalia Kalinnik, Erika Ábrahám, Tobias Schubert, Ralf Wimmer, and Bernd Becker. Exploiting different strategies for the parallelization of an SMT solver. In Manfred Dietrich, editor, *Proceedings of the 13<sup>th</sup> GI/ITG/GMM Workshop “Methoden und Beschreibungssprachen zur Modellierung und Verifikation von Schaltungen und Systemen” (MBMV)*, pages 97–106, Dresden, Germany, February 2010. Fraunhofer Verlag.
- [17] Ralf Wimmer and Bernd Becker. Correctness issues of symbolic bisimulation computation for Markov chains. In Bruno Müller-Clostermann, Klaus Echte, and Erwin Rathgeb, editors, *Proceedings of the 15<sup>th</sup> International GI/ITG Conference on “Measurement, Modelling and Evaluation of Computing Systems” (MMB) and “Dependability and Fault Tolerance” (DFT)*, volume 5987 of *Lecture Notes in Computer Science*, pages 287–301, Essen, Germany, March 2010. Springer-Verlag.
- [18] Marco Bozzano, Alessandro Cimatti, Joost-Pieter Katoen, Viet Yen Nguyen, Thomas Noll, Marco Roveri, and Ralf Wimmer. A model checker for AADL. In Tayssir Touili, Byron Cook, and Paul Jackson, editors, *Proceedings of the 22<sup>nd</sup>*

*International Conference on Computer-Aided Verification (CAV)*, volume 6174 of *Lecture Notes in Computer Science*, pages 562–565, Edinburgh, United Kingdom, July 2010. Springer-Verlag.

- [19] Ralf Wimmer, Bettina Braitling, Bernd Becker, Ernst Moritz Hahn, Pepijn Crouzen, Holger Hermanns, Abhishek Dhama, and Oliver Theel. Symblicit calculation of long-run averages for concurrent probabilistic systems. In Gianfranco Ciardo and Roberto Segala, editors, *Proceedings of the 7<sup>th</sup> International Conference on Quantitative Evaluation of Systems (QEST)*, pages 27–36, Williamsburg, Virginia, USA, September 2010. IEEE Computer Society Press.
- [20] Erika Ábrahám, Nils Jansen, Ralf Wimmer, Joost-Pieter Katoen, and Bernd Becker. DTMC model checking by SCC reduction. In Gianfranco Ciardo and Roberto Segala, editors, *Proceedings of the 7<sup>th</sup> International Conference on Quantitative Evaluation of Systems (QEST)*, pages 37–46, Williamsburg, Virginia, USA, September 2010. IEEE Computer Society Press.
- [21] Erika Ábrahám, Ulrich Loup, Ralf Wimmer, and Joost-Pieter Katoen. On the minimization of hybrid automata. In *Proceedings of the 22<sup>nd</sup> Nordic Workshop on Programming Theory (NWPT)*, Turku, Finland, November 2010.
- [22] Bettina Braitling, Ralf Wimmer, Bernd Becker, Nils Jansen, and Erika Ábrahám. SMT-based counterexample generation for Markov chains. In Frank Oppenheimer, editor, *Proceedings of the 14<sup>th</sup> Workshop “Methoden und Beschreibungssprachen zur Modellierung und Verifikation von Schaltungen und Systemen” (MBMV)*, pages 19–28, Oldenburg, Germany, March 2011. Offis Oldenburg.
- [23] Pepijn Crouzen, Ernst Moritz Hahn, Holger Hermanns, Abhishek Dhama, Oliver Theel, Ralf Wimmer, Bettina Braitling, and Bernd Becker. Bounded fairness for probabilistic distributed algorithms. In Benoit Caillaud and Josep Carmona, editors, *Proceedings of the 11<sup>th</sup> International Conference on Application of Concurrency to System Design (ACSD)*, pages 89–97, Newcastle Upon Tyne, United Kingdom, June 2011. IEEE Computer Society. (Outstanding Paper Award ACSD 2011).
- [24] Bettina Braitling, Ralf Wimmer, Bernd Becker, Nils Jansen, and Erika Ábrahám. Counterexample generation for Markov chains using SMT-based bounded model checking. In Roberto Bruni and Jürgen Dingel, editors, *Proceedings of the 13<sup>th</sup> IFIP International Conference on Formal Methods for Open Object-based Distributed Systems (FMOODS) / 31<sup>st</sup> IFIP International Conference on FORmal TEchniques for Networked and Distributed Systems (FORTE)*, volume 6722 of *Lecture Notes in Computer Science*, pages 75–89, Reykjavik, Iceland, June 2011. Springer-Verlag.
- [25] Ralf Wimmer, Ernst Moritz Hahn, Holger Hermanns, and Bernd Becker. Reachability analysis for incomplete networks of Markov decision processes. In Barbara Jobstmann and Michael Kishinevsky, editors, *Proceedings of the ACM/IEEE 9<sup>th</sup> International Conference on Formal Methods and Models for Codesign (MEMOCODE)*,

pages 151–160, Cambridge, United Kingdom, July 2011. IEEE Computer Society Press.

- [26] Nils Jansen, Erika Ábrahám, Jens Katelaan, Ralf Wimmer, Joost-Pieter Katoen, and Bernd Becker. Hierarchical counterexamples for discrete-time Markov chains. In Tevfik Bultan and Pao-Ann Hsiung, editors, *Proceedings of the 9<sup>th</sup> International Symposium on Automated Technology for Verification and Analysis*, volume 6996 of *Lecture Notes in Computer Science*, pages 443–452, Taipei, Taiwan, October 2011. Springer-Verlag.
- [27] Ralf Wimmer, Bernd Becker, Nils Jansen, Erika Ábrahám, and Joost-Pieter Katoen. Minimal critical subsystems as counterexamples for  $\omega$ -regular DTMC properties. In Jens Brandt and Klaus Schneider, editors, *Proceedings of the 15<sup>th</sup> Workshop “Methoden und Beschreibungssprachen zur Modellierung und Verifikation von Schaltungen und Systemen” (MBMV)*, Kaiserslautern, Germany, March 2012. Kovač-Verlag. (to appear).

## Theses

- [1] Ralf Wimmer. Ganzzahlige lineare Optimierung und Separierung mit binären Entscheidungsdiagrammen. Diploma thesis, Albert-Ludwigs-University, Freiburg im Breisgau, Germany, November 2004.
- [2] Ralf Wimmer. *Symbolische Methoden für die probabilistische Verifikation – Zustandsraumreduktion und Gegenbeispiele*. Dissertation, Albert-Ludwigs-University, Freiburg im Breisgau, Germany, January 2011.

## Technical Reports

- [1] Marc Herbstritt, Ralf Wimmer, Thomas Peikenkamp, Eckard Böde, Michael Adelaide, Sven Jahr, Holger Hermanns, and Bernd Becker. Analysis of large safety-critical systems: A quantitative approach. Reports of SFB/TR 14 AVACS 8, February 2006. ISSN: 1860-9821, <http://www.avacs.org>.
- [2] Ralf Wimmer, Holger Hermanns, Marc Herbstritt, and Bernd Becker. Towards symbolic stochastic aggregation. Reports of SFB/TR 14 AVACS 16, August 2007. ISSN: 1860-9821, <http://www.avacs.org>.
- [3] Ralf Wimmer, Alexander Kortus, Marc Herbstritt, and Bernd Becker. Symbolic model checking for DTMCs with exact and inexact arithmetic. Reports of SFB/TR 14 AVACS 30, August 2007. ISSN: 1860-9821, <http://www.avacs.org>.
- [4] Pepijn Crouzen, Ernst Moritz Hahn, Holger Hermanns, Abhishek Dhama, Oliver Theel, Ralf Wimmer, Bettina Braitling, and Bernd Becker. Bounded fairness for

probabilistic distributed algorithms. Reports of SFB/TR 14 AVACS 57, April 2010. ISSN: 1860-9821, <http://www.avacs.org>.

- [5] Nils Jansen, Erika Ábrahám, Jens Katelaan, Ralf Wimmer, Joost-Pieter Katoen, and Bernd Becker. Hierarchical counterexamples for discrete-time Markov chains. Aachener Informatik-Berichte AIB-2011-11, RWTH Aachen University, Aachen, Germany, May 2011. ISSN: 0935-3232, available at <http://aib.informatik.rwth-aachen.de/2011/2011-11.pdf>.