

Dirk Beyer

Curriculum Vitae

2012-05-06

Coordinates

Affiliation:	Universität Passau Lehrstuhl für Softwaresysteme Innstraße 33 D-94032 Passau Germany	Web:	http://www.sosy-lab.org/~dbeyer
		Office:	+49 (851) 509-3090
		Home:	+49 (851) 210-3345
Citizenship:	German	Year of birth:	1972
Town of birth:	Finsterwalde, Germany	Marital status:	Married, three children

Research Interests

My research focuses on models, algorithms, and tools for the construction and analysis of reliable software systems, in particular (tools in whose development I was involved are given in parentheses):

- Software model checking and static analysis (CPACHECKER, BLAST, CSISAT)
- Structural analysis and comprehension of large software systems (CROCO PAT, CCVISU)
- Interfaces for component-based design (CHIC)
- Formal verification of real-time systems (RABBIT)

The conceptional basis of my work is in software engineering, programming languages, data structures and efficient algorithms, and mathematical logic. My goal is not only to develop new concepts, but also to provide efficient tool implementations derived from the research results.

Education

1998 – 2002	Academic degree Dr. rer. nat. “magna cum laude” Brandenburgische Technische Universität Cottbus, Germany
1994 – 1998	Academic degree Diplom-Informatiker “with distinction” Brandenburgische Technische Universität Cottbus, Germany University award 1998 for Master’s thesis

Academic Employment

since 2009	Professor Universität Passau, Germany
since 2011	Adjunct Professor Simon Fraser University, B.C., Canada
2010 – 2011	Associate Professor Simon Fraser University, B.C., Canada
2006 – 2010	Assistant Professor Simon Fraser University, B.C., Canada
2004 – 2006	Postdoctoral Researcher, Host: Prof. Thomas A. Henzinger EPFL, Lausanne, Switzerland
2003 – 2004	Postdoctoral Researcher, Host: Prof. Thomas A. Henzinger University of California, Berkeley, U.S.A.
1998 – 2003	Research and Teaching Assistant, Advisor: Prof. Claus Lewerentz Brandenburgische Technische Universität Cottbus, Germany

Industrial Employment

1998 – 1998	Software Engineer Siemens AG, Business Services Dresden, Dept. Major Projects
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Software (Copyrighted as free software.)

1. BLAST: Model Checking of Software.
Contributor, conceptual extensions, implementation, and maintenance.
<http://www.sosy-lab.org/~dbeyer/Blast>
2. CCVISU: Visual Clustering and Software-Structure Assessment.
Principal designer and implementer.
<http://www.sosy-lab.org/~dbeyer/CCVisu>
3. CHECKDEP: Tracking Software Dependencies.
Principal designer, architect, and maintenance.
<http://www.sosy-lab.org/~dbeyer/CheckDep>
4. CHIC: Checking Interface Compatibility.
Contributor, new formalism, and verification algorithm.
<http://www.sosy-lab.org/~dbeyer/Chic>
5. CPACHECKER: Configurable Software Verification.
Principal designer, architect, implementation, and maintenance.
<http://www.sosy-lab.org/~dbeyer/CPAchecker>
6. CROCOPAT: Relational Programming (for Software-Structure Analysis).
Principal designer and implementer.
<http://www.sosy-lab.org/~dbeyer/CrocoPat>
7. CSISAT: Interpolation for LA+EUFL.
Contributor and designer.
<http://www.sosy-lab.org/~dbeyer/CSIsat>
8. DEPDIGGER: Detecting Complex Low-Level Dependencies.
Principal designer, architect, and maintenance.
<http://www.sosy-lab.org/~dbeyer/DepDigger>
9. RABBIT: Verification of Real-Time Systems.
Principal designer and implementer.
<http://www.sosy-lab.org/~dbeyer/Rabbit>

Publications

Electronic versions are available at <http://www.sosy-lab.org/~dbeyer/Publications>.

Book

1. Dirk Beyer. *Formale Verifikation von Realzeit-Systemen mittels Cottbus Timed Automata*. Mensch & Buch Verlag, Berlin, 2002. Also: Dissertation, Brandenburgische Technische Universität Cottbus, 2002.

Refereed Journal Papers

1. Dirk Beyer, Thomas A. Henzinger, Ranjit Jhala, and Rupak Majumdar. The software model checker BLAST: Applications to software engineering. *International Journal on Software Tools for Technology Transfer (STTT)*, 9(5-6):505–525, 2007. Invited to special issue of selected papers from FASE 2004/05.
2. Dirk Beyer, Andreas Noack, and Claus Lewerentz. Efficient relational calculation for software analysis. *IEEE Transactions on Software Engineering (TSE)*, 31(2):137–149, 2005. Invited to special issue of selected papers from WCRE 2003.

Refereed Conference Papers (with published proceedings)

1. Dirk Beyer. Competition on software verification (SV-COMP). In C. Flanagan and B. König, editors, *Proceedings of the 18th International Conference on Tools and Algorithms for the Construction and of Analysis Systems (TACAS 2012, Tallinn, Estonia, March 27-30)*, LNCS 7214, pages 504–524. Springer-Verlag, Heidelberg, 2012.
2. Sven Apel, Hendrik Speidel, Philipp Wendler, Alexander von Rhein, and Dirk Beyer. Detection of feature interactions using feature-aware verification. In *Proceedings of the 26th International Conference on Automated Software Engineering (ASE 2011, Lawrence, KS, November 6-10)*, pages 372–375. IEEE, 2011.

3. Dirk Beyer and M. Erkan Keremoglu. CPACHECKER: A tool for configurable software verification. In G. Gopalakrishnan and S. Qadeer, editors, *Proceedings of the 23rd International Conference on Computer Aided Verification (CAV 2011, Snowbird, UT, July 14-20)*, LNCS 6806, pages 184–190. Springer-Verlag, Heidelberg, 2011.
4. Sven Apel and Dirk Beyer. Feature cohesion in software product lines: An exploratory study. In *Proceedings of the 33rd International Conference on Software Engineering (ICSE 2011, Honolulu, HI, May 21-28)*, pages 421–430. ACM Press, New York (NY), 2011.
5. Dirk Beyer, M. Erkan Keremoglu, and Philipp Wendler. Predicate abstraction with adjustable-block encoding. In *Proceedings of the 10th International Conference on Formal Methods in Computer-Aided Design (FMCAD 2010, Lugano, October 20-23)*, pages 189–197. FMCAD, 2010.
6. Dirk Beyer and Ashgan Fararooy. CHECKDEP: A tool for tracking software dependencies. In *Proceedings of the 18th IEEE International Conference on Program Comprehension (ICPC 2010, Braga, June 30 - July 2)*, pages 42–43. IEEE Computer Society Press, Los Alamitos (CA), 2010.
7. Dirk Beyer and Ashgan Fararooy. DEPDIGGER: A tool for detecting complex low-level dependencies. In *Proceedings of the 18th IEEE International Conference on Program Comprehension (ICPC 2010, Braga, June 30 - July 2)*, pages 40–41. IEEE Computer Society Press, Los Alamitos (CA), 2010.
8. Dirk Beyer and Ashgan Fararooy. A simple and effective measure for complex low-level dependencies. In *Proceedings of the 18th IEEE International Conference on Program Comprehension (ICPC 2010, Braga, June 30 - July 2)*, pages 80–83. IEEE Computer Society Press, Los Alamitos (CA), 2010.
9. Dirk Beyer, Thomas A. Henzinger, Grégory Théoduloz, and Damien Zufferey. Shape refinement through explicit heap analysis. In D.S. Rosenblum and G. Taentzer, editors, *Proceedings of the 13th International Conference on Fundamental Approaches to Software Engineering (FASE 2010, Paphos, Cyprus, March 22-26)*, LNCS 6013, pages 263–277. Springer-Verlag, Heidelberg, 2010.
10. Dirk Beyer, Alessandro Cimatti, Alberto Griggio, M. Erkan Keremoglu, and Roberto Sebastiani. Software model checking via large-block encoding. In *Proceedings of the 9th International Conference on Formal Methods in Computer-Aided Design (FMCAD 2009, Austin, TX, November 15-18)*, pages 25–32. IEEE Computer Society Press, Los Alamitos (CA), 2009.
11. Dirk Beyer, Thomas A. Henzinger, and Grégory Théoduloz. Program analysis with dynamic precision adjustment. In *Proceedings of the 23rd IEEE/ACM International Conference on Automated Software Engineering (ASE 2008, L'Aquila, September 15-19)*, pages 29–38. IEEE Computer Society Press, Los Alamitos (CA), 2008.
12. Dirk Beyer, Damien Zufferey, and Rupak Majumdar. CSISAT: Interpolation for LA+EUF. In A. Gupta and S. Malik, editors, *Proceedings of the 20th International Conference on Computer Aided Verification (CAV 2008, Princeton, NY, July 7-14)*, LNCS 5123, pages 304–308. Springer-Verlag, Heidelberg, 2008.
13. Dirk Beyer. CCVISU: Automatic visual software decomposition. In *Proceedings of the 30th ACM/IEEE International Conference on Software Engineering (ICSE 2008, Leipzig, May 10-18)*, pages 967–968. ACM Press, New York (NY), 2008.
14. Dirk Beyer, Arindam Chakrabarti, Thomas A. Henzinger, and Sanjit A. Seshia. An application of web-service interfaces. In *Proceedings of the 2007 IEEE International Conference on Web Services (ICWS 2007, Salt Lake City, UT, July 9-13)*, pages 831–838. IEEE Computer Society Press, Los Alamitos (CA), 2007.
15. Dirk Beyer, Thomas A. Henzinger, and Vasu Singh. Algorithms for interface synthesis. In W. Damm and H. Hermanns, editors, *Proceedings of the 19th International Conference on Computer Aided Verification (CAV 2007, Berlin, July 3-7)*, LNCS 4590, pages 4–19. Springer-Verlag, Heidelberg, 2007.
16. Dirk Beyer, Thomas A. Henzinger, and Grégory Théoduloz. Configurable software verification: Concretizing the convergence of model checking and program analysis. In W. Damm and H. Hermanns, editors, *Proceedings of the 19th International Conference on Computer Aided Verification (CAV 2007, Berlin, July 3-7)*, LNCS 4590, pages 504–518. Springer-Verlag, Heidelberg, 2007.
17. Dirk Beyer, Thomas A. Henzinger, Rupak Majumdar, and Andrey Rybalchenko. Path invariants. In *Proceedings of the 2007 ACM Conference on Programming Language Design and Implementation (PLDI 2007, San Diego, CA, June 10-13)*, pages 300–309. ACM Press, New York (NY), 2007.

18. Dirk Beyer, Thomas A. Henzinger, Rupak Majumdar, and Andrey Rybalchenko. Invariant synthesis for combined theories. In *Proceedings of the Eighth International Conference on Verification, Model Checking, and Abstract Interpretation (VMCAI 2007, Nice, January 14-16)*, LNCS 4349, pages 378–394. Springer-Verlag, Heidelberg, 2007.
19. Dirk Beyer and Ahmed E. Hassan. Animated visualization of software history using evolution storyboards. In *Proceedings of the 13th IEEE Working Conference on Reverse Engineering (WCRE 2006, Benevento, October 23-27)*, pages 199–208. IEEE Computer Society Press, Los Alamitos (CA), 2006.
20. Dirk Beyer, Thomas A. Henzinger, and Grégory Théoduloz. Lazy shape analysis. In T. Ball and R.B. Jones, editors, *Proceedings of the 18th International Conference on Computer Aided Verification (CAV 2006, Seattle, WA, August 17-20)*, LNCS 4144, pages 532–546. Springer-Verlag, Heidelberg, 2006.
21. Dirk Beyer and Ahmed E. Hassan. Evolution storyboards: Visualization of software structure dynamics. In *Proceedings of the 14th IEEE International Conference on Program Comprehension (ICPC 2006, Athens, June 14-16)*, pages 248–251. IEEE Computer Society Press, Los Alamitos (CA), 2006.
22. Dirk Beyer. Relational programming with CROCOPAT. In *Proceedings of the 28th ACM/IEEE International Conference on Software Engineering (ICSE 2006, Shanghai, May 20-28)*, pages 807–810. ACM Press, New York (NY), 2006.
23. Basil Becker, Dirk Beyer, Holger Giese, Florian Klein, and Daniela Schilling. Symbolic invariant verification for systems with dynamic structural adaptation. In *Proceedings of the 28th ACM/IEEE International Conference on Software Engineering (ICSE 2006, Shanghai, May 20-28)*, pages 72–81. ACM Press, New York (NY), 2006.
24. Dirk Beyer. Co-change visualization. In *Proceedings of the 21st IEEE International Conference on Software Maintenance (ICSM 2005, Budapest, September 25-30)*, Industrial and Tool volume, pages 89–92, Budapest, 2005.
25. Dirk Beyer and Andreas Noack. Clustering software artifacts based on frequent common changes. In *Proceedings of the 13th IEEE International Workshop on Program Comprehension (IWPC 2005, St. Louis, MO, May 15-16)*, pages 259–268. IEEE Computer Society Press, Los Alamitos (CA), 2005.
26. Dirk Beyer, Arindam Chakrabarti, and Thomas A. Henzinger. Web service interfaces. In *Proceedings of the 14th ACM International World Wide Web Conference (WWW 2005, Chiba, May 10-14)*, pages 148–159. ACM Press, New York (NY), 2005.
27. Dirk Beyer, Thomas A. Henzinger, Ranjit Jhala, and Rupak Majumdar. Checking memory safety with BLAST. In M. Cerioli, editor, *Proceedings of the Eighth International Conference on Fundamental Approaches to Software Engineering (FASE 2005, Edinburgh, April 2-10)*, LNCS 3442, pages 2–18. Springer-Verlag, Heidelberg, 2005.
28. Dirk Beyer, Adam J. Chlipala, Thomas A. Henzinger, Ranjit Jhala, and Rupak Majumdar. The BLAST query language for software verification. In R. Giacobazzi, editor, *Proceedings of the 11th International Static Analysis Symposium (SAS 2004, Verona, August 26-28)*, LNCS 3148, pages 2–18. Springer-Verlag, Heidelberg, 2004.
29. Dirk Beyer, Thomas A. Henzinger, Ranjit Jhala, and Rupak Majumdar. An Eclipse plug-in for model checking. In *Proceedings of the 12th IEEE International Workshop on Program Comprehension (IWPC 2004, Bari, June 24-26)*, pages 251–255. IEEE Computer Society Press, Los Alamitos (CA), 2004.
30. Dirk Beyer, Adam J. Chlipala, Thomas A. Henzinger, Ranjit Jhala, and Rupak Majumdar. Generating tests from counterexamples. In *Proceedings of the 26th IEEE International Conference on Software Engineering (ICSE 2004, Edinburgh, May 26-28)*, pages 326–335. IEEE Computer Society Press, Los Alamitos (CA), 2004.
31. Dirk Beyer, Andreas Noack, and Claus Lewerentz. Simple and efficient relational querying of software structures. In *Proceedings of the Tenth IEEE Working Conference on Reverse Engineering (WCRE 2003, Victoria, BC, November 13-16)*, pages 216–225. IEEE Computer Society Press, Los Alamitos (CA), 2003.
32. Dirk Beyer and Andreas Noack. Can decision diagrams overcome state space explosion in real-time verification? In H. König, M. Heiner, and A. Wolisz, editors, *Proceedings of the 23rd IFIP International Conference on Formal Techniques for Networked and Distributed Systems (FOR-*

- TE 2003, Berlin, September 29 - October 2*), LNCS 2767, pages 193–208. Springer-Verlag, Heidelberg, 2003.
33. Dirk Beyer, Claus Lewerentz, and Andreas Noack. Rabbit: A tool for BDD-based verification of real-time systems. In W. A. Hunt and F. Somenzi, editors, *Proceedings of the 15th International Conference on Computer Aided Verification (CAV 2003, Boulder, CO, July 8-12)*, LNCS 2725, pages 122–125. Springer-Verlag, Heidelberg, 2003.
 34. Dirk Beyer and Claus Lewerentz. GROCOPAT: Efficient pattern analysis in object-oriented programs. In *Proceedings of the 11th IEEE International Workshop on Program Comprehension (IWPC 2003, Portland, OR, May 10-11)*, pages 294–295. IEEE Computer Society Press, Los Alamitos (CA), 2003.
 35. Dirk Beyer. Efficient reachability analysis and refinement checking of timed automata using BDDs. In T. Margaria and T. F. Melham, editors, *Proceedings of the 11th IFIP Advanced Research Working Conference on Correct Hardware Design and Verification Methods (CHARME 2001, Livingston, September 4-7)*, LNCS 2144, pages 86–91. Springer-Verlag, Heidelberg, 2001.
 36. Dirk Beyer. Improvements in BDD-based reachability analysis of timed automata. In J. N. Oliveira and P. Zave, editors, *Proceedings of the Tenth International Symposium of Formal Methods Europe (FME 2001, Berlin, March 12-16): Formal Methods for Increasing Software Productivity*, LNCS 2021, pages 318–343. Springer-Verlag, Heidelberg, 2001.
 37. Dirk Beyer, Claus Lewerentz, and Frank Simon. Impact of inheritance on metrics for size, coupling, and cohesion in object oriented systems. In R. Dumke and A. Abran, editors, *Proceedings of the Tenth International Workshop on Software Measurement (IWSM 2000, Berlin, October 4-6): New Approaches in Software Measurement*, LNCS 2006, pages 1–17. Springer-Verlag, Heidelberg, 2001.
 38. Dirk Beyer and Heinrich Rust. A tool for modular modelling and verification of hybrid systems. In A. Crespo and J. Vila, editors, *Proceedings of the 25th IFAC/IFIP Workshop on Real-Time Programming (WRTP 2000, Palma, May 17-19)*, pages 169–174. Elsevier Science, Oxford, 2000.

Refereed Workshop Papers

1. Alain Wegmann, Lam-Son Le, Lotfi Hussami, and Dirk Beyer. A tool for verified design using Alloy for specification and CrocoPat for verification. In D. Jackson and P. Zave, editors, *Proceedings of the First Alloy Workshop (ALLOY 2006, Portland, OR, November 6)*, 2006.
2. Dirk Beyer. Co-change visualization applied to PostgreSQL and ArgoUML. In *Proceedings of the Third International Workshop on Mining Software Repositories (MSR 2006, Shanghai, May 22-23)*, pages 165–166. ACM Press, 2006.
3. Dirk Beyer, Arindam Chakrabarti, and Thomas A. Henzinger. An interface formalism for web services. In *Proceedings of the First International Workshop on Foundations of Interface Technologies (FIT 2005, San Francisco, CA, August 21)*, 2005.
4. Dirk Beyer. Rabbit: Verification of real-time systems. In P. Pettersson and S. Yovine, editors, *Proceedings of the Workshop on Real-Time Tools (RT-TOOLS 2001, Aalborg, August 20)*, pages 13–21, Uppsala, 2001.
5. Dirk Beyer and Andreas Noack. Efficient verification of timed automata using BDDs. In S. Gnesi and U. Ultes-Nitsche, editors, *Proceedings of the Sixth International ERCIM Workshop on Formal Methods for Industrial Critical Systems (FMICS 2001, Paris, July 16-17)*, pages 95–113. INRIA, Paris, 2001.
6. Dirk Beyer and Andy Heinig. Different strategies for BDD-based reachability analysis of timed automata. In C. Rattray, M. Sveda, and J. Rozenblit, editors, *Proceedings of the Second IEEE/IFIP Joint Workshop on Formal Specifications of Computer-Based Systems (FSCBS 2001, Washington, D.C., April 20)*, pages 89–98, Stirling, 2001.
7. Dirk Beyer and Heinrich Rust. Cottbus Timed Automata: Formal definition and semantics. In C. Rattray, M. Sveda, and J. Rozenblit, editors, *Proceedings of the Second IEEE/IFIP Joint Workshop on Formal Specifications of Computer-Based Systems (FSCBS 2001, Washington, D.C., April 20)*, pages 75–87, Stirling, 2001.
8. Dirk Beyer and Andreas Noack. BDD-basierte Verifikation von Realzeit-Systemen. In J. Grabowski and S. Heymer, editors, *Tagungsband Formale Beschreibungstechniken für verteilte Systeme (FBT 2000, Lübeck, June 22-23)*, pages 79–89. Shaker Verlag, Aachen, 2000.

9. Dirk Beyer and Heinrich Rust. Modular modelling and verification with Cottbus Timed Automata. In C. Rattray and M. Sveda, editors, *Proceedings of the IEEE/IFIP Joint Workshop on Formal Specifications of Computer-Based Systems (FSCBS 2000, Edinburgh, April 6-7)*, pages 17–24, Stirling, 2000.
10. Dirk Beyer, Claus Lewerentz, and Heinrich Rust. Modelling and analysing a railroad crossing in a modular way. In S. Gnesi, I. Schieferdecker, and A. Rennoch, editors, *Proceedings of the Fifth International ERCIM Workshop on Formal Methods for Industrial Critical Systems (FMICS 2000, Berlin, April 3-4)*, pages 287–303, Berlin, 2000.
11. Dirk Beyer and Heinrich Rust. Concepts of Cottbus Timed Automata. In K. Spies and B. Schätz, editors, *Tagungsband Formale Beschreibungstechniken für verteilte Systeme (FBT 1999, München, June 17-18)*, pages 27–34. Herbert Utz Verlag, München, 1999.
12. Dirk Beyer and Heinrich Rust. Modeling a production cell as a distributed real-time system with Cottbus Timed Automata. In H. König and P. Langendörfer, editors, *Tagungsband Formale Beschreibungstechniken für verteilte Systeme (FBT 1998, Cottbus, June 4-5)*, pages 148–159. Shaker Verlag, Aachen, 1998.

Technical Reports

1. Sven Apel, Hendrik Speidel, Philipp Wendler, Alexander von Rhein, and Dirk Beyer. Feature-aware verification. Technical Report MIP-1105, Department of Computer Science and Mathematics (FIM), University of Passau (PA), September 2011.
2. Dirk Beyer, Thomas A. Henzinger, M. Erkan Keremoglu, and Philipp Wendler. Conditional model checking. Technical Report MIP-1107, Department of Computer Science and Mathematics (FIM), University of Passau (PA), September 2011.
3. Dirk Beyer, Alessandro Cimatti, Alberto Griggio, M. Erkan Keremoglu, and Roberto Sebastiani. Software model checking via large-block encoding. Technical Report SFU-CS-2009-09, School of Computing Science (CMPT), Simon Fraser University (SFU), April 2009.
4. Dirk Beyer and M. Erkan Keremoglu. CPAchecker: A tool for configurable software verification. Technical Report SFU-CS-2009-02, School of Computing Science (CMPT), Simon Fraser University (SFU), January 2009.
5. Dirk Beyer, Arindam Chakrabarti, and Thomas A. Henzinger. An interface formalism for web services. Technical Report MTC-REPORT-2007-002, School of Computer and Communication Sciences (IC), Ecole Polytechnique Fédérale de Lausanne (EPFL), December 2007.
6. Dirk Beyer, Thomas A. Henzinger, Rupak Majumdar, and Andrey Rybalchenko. Path invariants. Technical Report MTC-REPORT-2006-003, School of Computer and Communication Sciences (IC), Ecole Polytechnique Fédérale de Lausanne (EPFL), December 2006.
7. Dirk Beyer, Thomas A. Henzinger, and Vasu Singh. Three algorithms for interface synthesis: A comparative study. Technical Report MTC-REPORT-2006-001, School of Computer and Communication Sciences (IC), Ecole Polytechnique Fédérale de Lausanne (EPFL), May 2006.
8. Dirk Beyer, Thomas A. Henzinger, and Grégory Théoduloz. Lazy shape analysis. Technical Report MTC-REPORT-2005-006, School of Computer and Communication Sciences (IC), Ecole Polytechnique Fédérale de Lausanne (EPFL), December 2005.
9. Dirk Beyer and Andreas Noack. Mining co-change clusters from version repositories. Technical Report IC/2005/003, School of Computer and Communication Sciences (IC), Ecole Polytechnique Fédérale de Lausanne (EPFL), January 2005.
10. Dirk Beyer and Andreas Noack. CrocoPat 2.1 Introduction and reference manual. Technical Report UCB//CSD-04-1338, Computer Science Division (EECS), University of California, Berkeley, July 2004. Also: The Computing Research Repository (CoRR), cs.PL/0409009, September 2004.
11. Dirk Beyer and Claus Lewerentz. CrocoPat: A tool for efficient pattern recognition in large object-oriented programs. Technical Report I-04/2003, Institute of Computer Science, Brandenburgische Technische Universität Cottbus, January 2003.
12. Dirk Beyer and Andreas Noack. A comparative study of decision diagrams for real-time verification. Technical Report I-03/2003, Institute of Computer Science, Brandenburgische Technische Universität Cottbus, January 2003.
13. Dirk Beyer. Rabbit: Verification of real-time systems. Technical Report I-05/2001, Institute of Computer Science, Brandenburgische Technische Universität Cottbus, March 2001.

14. Dirk Beyer. Reachability analysis and refinement checking for BDD-based model checking of timed automata. Technical Report I-04/2001, Institute of Computer Science, Brandenburgische Technische Universität Cottbus, February 2001.
15. Dirk Beyer and Andreas Noack. Efficient verification of real-time systems using BDDs. Technical Report I-13/2000, Institute of Computer Science, Brandenburgische Technische Universität Cottbus, December 2000.
16. Dirk Beyer, Claus Lewerentz, and Frank Simon. Flattening inheritance structures – or – Getting the right picture of large OO-systems. Technical Report I-12/2000, Institute of Computer Science, Brandenburgische Technische Universität Cottbus, November 2000.
17. Frank Simon and Dirk Beyer. Considering inheritance, overriding, overloading and polymorphism for measuring C++ sources. Technical Report I-04/2000, Institute of Computer Science, Brandenburgische Technische Universität Cottbus, May 2000.
18. Dirk Beyer and Heinrich Rust. A formalism for modular modelling of hybrid systems. Technical Report I-10/1999, Institute of Computer Science, Brandenburgische Technische Universität Cottbus, October 1999.
19. Dirk Beyer and Heinrich Rust. A modular hybrid modelling notation. Technical Report I-03/1999, Institute of Computer Science, Brandenburgische Technische Universität Cottbus, February 1999.

Guest Lectures and Invited Talks

1. *Towards a Unified Framework for Software Verification.*
Alpine Verification Meeting, Lugano, 2010-10-19.
2. *Adjustable-Block Encoding.*
Oxford University, 2010-10-14.
3. *Protocol Interfaces.*
Workshop on Foundations of Interface Technologies, Paris, 2010-08-30.
4. *Adjustable-Block Encoding — Towards a Unified Framework for Software Verification.*
Computer Science Symposium at IST Austria, Klosterneuburg, 2010-05-07.
5. *Program Analysis with Dynamic Change of Precision.*
University of California, Berkeley (CA), 2009-04-16.
6. *Panelist on Talent, University-Industry Cooperation, and Curriculum Development.*
Pacific Northwest Wireless Summit 2009 (PNWS'09), Vancouver, 2009-01-19.
7. *Datenfluss-Analyse mit dynamischer Anpassung der Genauigkeit.*
Brandenburg University of Technology, Cottbus, 2008-11-07.
8. *Predicate Abstraction with Summarization.*
TRESOR Seminar at EPFL, Lausanne, 2008-11-05.
9. *Building Software-Engineering Tools in Academia.*
Second International Workshop on Advanced Software Development Tools and Techniques (WASDeTT'08), Workshop at ICSM'09, Beijing, 2008-10-03.
10. *Struktur-Analyse und Verifikation Großer Software-Systeme*
University of Passau, Passau, 2008-07-21.
11. *Teaching Software Engineering on Mobile Devices.*
NOKIA University Relations Forum, NOKIA, Burnaby, 2008-06-12.
12. *The Software Model Checker BLAST.*
Guest Lecture in Viktor Kuncak's Verification Course, EPFL-IC-LARA, Lausanne, 2008-05-08.
13. *Structure Analysis of Large Software Systems.*
University of Victoria, Victoria, 2007-09-21.
14. *Path Invariants.*
University of British Columbia, Vancouver, 2007-06-20.
15. *Web Service Interfaces.*
Workshop on Constraints for Composing Web Services, LORIA, Nancy, 2006-06-27.
16. *Combining Model Checking and Shape Analysis.*
Dagstuhl Seminar 06081 "Software Verification", 2006-02-20.
17. *Structure Analysis of Large Software Systems.*
Oxford University, 2006-02-14.

18. *Formal and Semi-Formal Methods in Software Engineering.*
IT University, Göteborg, 2005-12-15.
19. *Combining Data Flow Analysis with Lazy Abstraction Refinement in BLAST.*
Politecnico di Milano, 2005-12-02.
20. *Formale Verifikation von Realzeit-Systemen mittels Cottbus Timed Automata.*
Fraunhofer-Gesellschaft FIRST, Berlin, 2003-04-11.
21. *Efficient BDD Representation for Reachability Analysis of Timed Automata.*
Carnegie Mellon University, Pittsburgh (PA), 2003-01-14.
22. *A Modular Approach for Formal Verification of Real-Time Systems.*
Software Engineering Institute, Pittsburgh (PA), 2003-01-10.
23. *Improvements in BDD-based Reachability Analysis of Timed Automata.*
Naval Research Laboratory, Washington (D.C.), 2001-04-23.
24. *Entwurfsmuster: Eine Einführung.*
PC-Soft GmbH, Senftenberg, 1997-12-16.

Conference and Other Presentations

1. *Competition on Software Verification.*
18th International Conference on Tools and Algorithms for the Construction and of Analysis Systems
TACAS 2012, Tallinn, 2012-03-29.
2. *CPAchecker: A Tool for Configurable Software Verification.*
23rd International Conference on Computer Aided Verification
CAV 2011, Snowbird (UT), 2011-07-19.
3. *CPAchecker: A Tool for Configurable Software Verification.*
15th Biennial Workshop on Programmiersprachen und Grundlagen der Programmierung
KPS 2009, Maria Taferl, 2009-10-14.
4. *Evolution Storyboards: Visualization of Software Structure Dynamics.*
14th International Conference on Program Comprehension
ICPC 2006, Athens, 2006-06-16.
5. *Co-change Visualization Applied to PostgreSQL and ArgoUML.*
3rd International Workshop on Mining Software Repositories
MSR 2006, Shanghai, 2006-05-23.
6. *Co-Change Visualization.*
21st IEEE International Conference on Software Maintenance
ICSM 2005, Budapest, 2005-09-26.
7. *Clustering Software Artifacts Based on Frequent Common Changes.*
13th IEEE International Workshop on Program Comprehension
IWPC 2005, St. Louis, 2005-05-16.
8. *CrocoPat: An Efficient Calculator for Relational Programs.*
TRESOR seminar, EPFL, Lausanne, 2005-04-14.
9. *An Introduction to Binary Decision Diagrams.*
CAV lecture, EPFL, Lausanne, 2004-11-18.
10. *An Eclipse Plug-in for Model Checking.*
12th IEEE International Workshop on Program Comprehension
IWPC 2004, Bari, 2004-06-26.
11. *Generating Tests from Counterexamples.*
26th International Conference on Software Engineering
ICSE 2004, Edinburgh, 2004-05-27.
12. *Generating Tests from Counterexamples.*
EPFL, Lausanne, 2004-05-18.
13. *Simple and Efficient Relational Querying.*
OSQ seminar, University of California, Berkeley (CA), 2004-02-02.
14. *How to Make Model Checking of Timed Automata Efficient.*
University of California, Berkeley (CA), 2003-10-29.

15. *Rabbit: A Tool for BDD-based Verification of Real-Time Systems.*
15th International Conference on Computer Aided Verification
CAV 2003, Boulder (CO), 2003-07-09.
16. *CrocoPat: Efficient Pattern Analysis in Object-Oriented Programs.*
11th IEEE International Workshop on Program Comprehension
IWPC 2003, Portland (OR), 2003-05-11.
17. *Formale Verifikation von Realzeit-Systemen mittels Cottbus Timed Automata.*
Dissertation, Cottbus, 2002-11-26.
18. *Efficient Reachability Analysis and Refinement Checking of Timed Automata using BDDs.*
11th IFIP Working Conference on Correct Hardware Design and Verification Methods
CHARME 2001, Livingston, 2001-09-04.
19. *Verification of Real-Time Systems.*
Workshop on Real-Time Tools
RT-TOOLS 2001, Aalborg, 2001-08-20.
20. *Efficient Verification of Timed Automata using BDDs.*
6th International ERCIM Workshop on Formal Methods for Industrial Critical Systems
FMICS 2001, Paris, 2001-07-16.
21. *Different Strategies for BDD-based Reachability Analysis of Timed Automata.*
2nd IEEE/IFIP Joint Workshop on Formal Specifications of Computer-Based Systems
FSCBS 2001, Washington (D.C.), 2001-04-20.
22. *Cottbus Timed Automata: Formal Definition and Semantics.*
2nd IEEE/IFIP Joint Workshop on Formal Specifications of Computer-Based Systems
FSCBS 2001, Washington (D.C.), 2001-04-20.
23. *Improvements in BDD-based Reachability Analysis of Timed Automata.*
10th International Symposium of Formal Methods Europe
FME 2001, Berlin, 2001-03-15.
24. *A Tool for Modular Modelling and Verification of Hybrid Systems.*
25th IFAC/IFIP Workshop on Real-Time Programming
WRTP 2000, Palma, 2000-05-19.
25. *Modular Modelling and Verification with Cottbus Timed Automata.*
IEEE/IFIP Joint Workshop on Formal Specifications of Computer-Based Systems
FSCBS 2000, Edinburgh, 2000-04-06.
26. *Modelling and Analysing a Railroad Crossing in a Modular Way.*
5th International ERCIM Workshop on Formal Methods for Industrial Critical Systems
FMICS 2000, Berlin, 2000-04-04.
27. *Concepts of Cottbus Timed Automata.*
Workshop Formale Beschreibungstechniken für verteilte Systeme
FBT 1999, München, 1999-06-17.
28. *Ein Analysewerkzeug für zeitbehaftete Automaten.*
Diplomarbeit, Cottbus, 1998-06-30.
29. *Modeling a Production Cell as a Distributed Real-Time System with Cottbus Timed Automata.*
Workshop Formale Beschreibungstechniken für verteilte Systeme
FBT 1998, Cottbus, 1998-06-04.

University Activities

Instruction at University of Passau

Undergraduate courses:

Software Engineering, 5300
Winter 2009/10

Algorithms and Data Structures, 5200
Summer 2010

Foundations of Computer Science, 5100
Winter 2010/11

Graduate courses:

Software Analysis, 5840
Winter 2009/10, Winter 2011/12
Object-Oriented Programming, 5620
Summer 2010
Principles of Compiler Design, 5790
Summer 2012

Graduate seminars:

Seminar Softwaretechnik, 5847
Winter 2009/10, Winter 2010/11, Winter 2011/12
Seminar Software Testing and Analysis, 5848
Summer 2010

Events for High-School Students:

Sommerncamp Informatik, 5900
Summer 2010, Summer 2011

Instruction at SFU

Undergraduate courses:

Principles of Compiler Design, CMPT 379
Spring 2008, Spring 2009
Software Engineering II, CMPT 475
Spring 2007, Spring 2008, Fall 2008

Graduate courses:

Software Engineering, CMPT 745
Fall 2007, Fall 2008
Special Topics in CS - Program Analysis, CMPT 880
Spring 2007

Graduate seminars:

Software Verification, CMPT 894
Spring 2008, Spring 2009

Teaching Assistant at EPFL and BTU

Undergraduate courses:

Theoretical Computer Science, Prof. Henzinger
Winter 2005/06
Introduction to Computer Science, Prof. Bachmann
Winter 2002/03
Introduction to Data Structures and Efficient Algorithms, Prof. Heiner
Winter 2000/01, Winter 1998/99
Introduction to Software Engineering, Prof. Lewerentz
Summer 2000, Summer 1999
Introduction to Software Engineering (for teachers from high schools), Prof. Lewerentz
Summer 2000
Introduction to Software Engineering (for engineers from industry), Prof. Lewerentz
Summer 2002, Summer 1999
Introduction to Software Engineering (for students of engineering), Prof. Lewerentz
Summer 2001
Computer Science (for students of environmental and resource management), Dr. Rust
Winter 2000/01, Winter 1999/2000

Software Project, Prof. Lewerentz
Winter 2002/03, Summer 2002, Winter 2001/02, Summer 2001, Winter 2000/01, Summer 1999

Graduate courses:

Computer-Aided Verification, Prof. Henzinger
Winter 2004/05

Software Engineering I, Prof. Lewerentz
Winter 2001/02

Software Engineering II, Prof. Lewerentz
Sommer 2003, Summer 2002, Summer 2001

Software Project Management, Prof. Lewerentz
Winter 2001/02

Graduate seminars:

Thrust in Reliable Software (TRESOR)
Winter 2004/05, Summer 2005, Winter 2005/06

Complexity and Software
Winter 2002/03

Advising

Current students:

Stefan Löwe, PhD program;
Philipp Wendler, PhD program;

Master's thesis supervisor:

Andra-Maria Babau, Uni Passau, 2011,
Modeling and Verification of Airport Security Processes using BPMN and Protocol Interfaces — A Case Study

Dmitry Balzer, Uni Passau, 2010,
Werkzeugunterstützung für Verstehen und Monitoring von Software-Abhängigkeiten

Alexander von Rhein, Uni Passau, 2010,
Verification Tasks for Software Model Checking

Ashgan Fararooy, SFU, 2010,
Performing Static Structure Analysis using Software Dependencies

Philipp Wendler, Uni Passau, 2010,
Software Verification based on Adjustable Large-Block Encoding,
won the NRW Young Scientist Award 2010 in Dynamic Intelligent Systems,
received for the Faculty Award 2011 for best Master's thesis,
and the yearly award of the industrial association of the region Niederbayern IHK

Damien Zufferey, EPFL, 2009, with Prof. Henzinger

Grégory Théoduloz, EPFL, 2006, with Prof. Henzinger,
Integrating Shape Analysis into the Model Checker BLAST,
won the EPFL Umicible Award 2006 and the ELCA Informatique Prize

Andreas Noack, BTU, 2000, with Prof. Lewerentz,
BDD-basierte Verifikation von Echtzeitsystemen,
won the BTU University Award 2000 for best Master's thesis

Bachelor's thesis supervisor:

Michael Käufel, Uni Passau, 2011,
Extraction of Protocol Interfaces from C Programs

Internship students:

Przemyslaw Daca (from TU Denmark), Uni Passau, 2011;
Philipp Wendler (from Uni Passau), SFU, 2009;

Michael Tautschnig (from TU Darmstadt), SFU, 2008;
Andreas Holzer (from TU Darmstadt), SFU, 2008;
Alberto Griggio (from Uni Trento), SFU, 2008;
Damien Zufferey (from EPFL), SFU, 2007;
Sudhanshu Narang (from IIT Delhi), SFU, 2007;
Rajhans Samdani (from IIT Bombay), EPFL, 2006;
Nitesh Kumar (from IIT Kanpur), EPFL, 2005

PhD thesis defense chair:

Roosbeh Farahbod, SFU, 2009

PhD depth examination chair:

Brian Fraser, SFU, 2007

MSc thesis referee:

Hendrik Speidel, Uni Passau, 2011
Kathrin Hanauer, Uni Passau, 2010
George Ma, SFU, 2007

MSc thesis defence examiner:

Wolfgang Haas, SFU, 2007;
George Ma, SFU, 2007

MSc thesis defense chair:

Kaiyan Jin, SFU, 2009;
Edward Glen, SFU, 2007;
Majid Bagheri, SFU, 2007;
Chiyoko Kawano, SFU, 2006

Departmental and University Committees

Vorsitz Berufungskommission W3 “Complex-Systems Engineering”, Uni Passau, 2012
Promotionsausschuss FIM, Uni Passau, 2010–2012
Berufungskommission W2 “Medieninformatik”, Uni Passau, 2011
Berufungskommission W3 “Bildverarbeitung”, Uni Passau, 2009–2011
Hardware and Capital Resources Committee, SFU, 2008–2009
Faculty Recruiting Committee, SFU, 2007–2008
Faculty Council, BTU Cottbus, 1998–2000
President of the CS Students’ Organization, BTU Cottbus, 1997–1998

Professional Activities

Conference Organizer

1. General Chair, 20th IEEE Int. Conference on Program Comprehension (ICPC), Passau, Bavaria, Germany, June 11–13, 2012
2. Organizer, 7th Alpine Verification Meeting (AVM), Passau, Bavaria, Germany, May 21–22, 2012
3. Organizer, 1st TACAS 2012 Competition on Software Verification (SV-COMP), Tallinn, Estonia, March 29, 2012
4. Local Organization Chair, 31st IEEE International Conference on Software Engineering (ICSE), Vancouver, BC, Canada, May 16–24, 2009

5. Local Organization Chair, 17th IEEE Int. Conference on Program Comprehension (ICPC), Vancouver, BC, Canada, May 17–19, 2009
6. Local Organization Chair, 6th IEEE Working Conference on Mining Software Repositories (MSR), Vancouver, BC, Canada, May 16–17, 2009
7. Proceedings Chair, 25th IEEE International Conference on Software Maintenance (ICSM), Edmonton, AB, Canada, September 20–26, 2009
8. Local Organization Chair, 14th IEEE Working Conference on Reverse Engineering (WCRE), Vancouver, BC, Canada, October 28–31, 2007
9. Founder and Organizer, First Alpine Verification Meeting (AVM'05), Lausanne, Switzerland, October 6, 2005

Member of Conference Program Committees

1. 19th International Workshop on Model Checking of Software (SPIN), 2012
2. 6th International Conference on Tests and Proofs (TAP), 2012
3. 32nd IFIP International Conference on Formal Techniques for Networked and Distributed Systems (FORTE), 2012
4. 28th IEEE International Conference on Software Maintenance (ICSM), 2012
5. 6th IEEE International Symposium on Theoretical Aspects of Software Engineering (TASE), 2012
6. 18th Working Conference on Reverse Engineering (WCRE), 2011
7. 6th International Workshop on Systems Software Verification (SSV), 2011
8. 31st IFIP International Conference on Formal Techniques for Networked and Distributed Systems (FORTE), 2011
9. 27th IEEE International Conference on Software Maintenance (ICSM), 2011
10. 19th IEEE International Conference on Program Comprehension (ICPC), 2011
11. 5th International Conference on Tests and Proofs (TAP), 2011
12. 17th Working Conference on Reverse Engineering (WCRE), 2010
13. 26th IEEE International Conference on Software Maintenance (ICSM), 2010, Industrial Track
14. 4th IEEE International Symposium on Theoretical Aspects of Software Engineering (TASE), 2010
15. 4th International Conference on Tests and Proofs (TAP), 2010
16. 18th IEEE International Conference on Program Comprehension (ICPC), 2010
17. 19th Annual Int. Conference on Computer Science and Software Engineering (CASCON), 2009
18. 16th Working Conference on Reverse Engineering (WCRE), 2009
19. 17th IEEE International Conference on Program Comprehension (ICPC), 2009
20. 18th Annual Int. Conference on Computer Science and Software Engineering (CASCON), 2008
21. 15th Working Conference on Reverse Engineering (WCRE), 2008
22. 24th IEEE International Conference on Software Maintenance (ICSM), 2008
23. 19th International Conference on Concurrency Theory (CONCUR), 2008
24. 16th IEEE International Conference on Program Comprehension (ICPC), 2008
25. 23rd IEEE International Conference on Software Maintenance (ICSM), 2007
26. 15th IEEE International Conference on Program Comprehension (ICPC), 2007
27. 11th European Conference on Software Maintenance and Reengineering (CSMR), 2007, Doctoral Symposium
28. 22nd IEEE International Conference on Software Maintenance (ICSM), 2006

Journal Referee

- IEEE Software, 2011;
- ACM Transactions on Software Engineering and Methodology (TOSEM), 2011;
- International Journal on Software Tools for Technology Transfer (STTT), Springer, 2011;

Science of Computer Programming (SCICO), Elsevier, 2011;
Empirical Software Engineering (EMSE), Springer, 2011;
Automated Software Engineering (ASE), Springer, 2011;
Arabian Journal for Science and Engineering (AJSE), 2011;
IEEE Transactions on Software Engineering (TSE), 2010;
ACM Transactions on Software Engineering and Methodology (TOSEM), 2010;
Software Quality Journal, Special Issue on ICPC'09, 2010;
Journal for Graph Algorithms and Applications (JGAA), 2010;
IEEE Software, Special Issue on Software Evolution, 2009;
Journal of Systems and Software (JSS), 2009;
Journal on Formal Aspects of Computing (FACJ), 2009;
International Journal on Software Tools for Technology Transfer (STTT), 2009;
IEEE Transactions on Software Engineering (TSE), 2009;
Journal of Software Maintenance and Evolution: Research and Practice (JSME), 2009;
IEEE Systems Journal, 2008;
IEEE Transactions on Software Engineering (TSE), 2008;
ACM Transactions on Design Automation of Electronic Systems (TODAES), 2008;
Simulation Modelling Practice and Theory, 2008;
ACM Transactions on Software Engineering and Methodology (TOSEM), 2007;
IEEE Transactions on Software Engineering (TSE), 2007;
International Journal of Computers and Their Applications (IJCA), 2007;
International Journal on Software Tools for Technology Transfer (STTT), 2006;
ACM Transactions on Software Engineering and Methodology (TOSEM), 2006;
ACM Transactions on Design Automation of Electronic Systems (TODAES), 2005

Conference Referee

Int. Conf. on Verification, Model Checking, and Abstract Interpretation (VMCAI), 2012;
Festschrift Manfred Nagl (FMN), 2009;
Int. Conf. on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), 2009;
Int. Conference on Verification, Model Checking and Abstract Interpretation (VMCAI), 2009;
International Conference on Computer-Aided Verification (CAV), 2008;
Joint Eurographics - IEEE TCVG Symposium on Visualization (EUROVIS), 2008;
ACM Symposium on Principles of Programming Languages (POPL), 2007;
ACM Int. Symposium on Principles and Practice of Declarative Programming (PPDP), 2007;
ACM/IEEE International Conference on Software Engineering (ICSE), 2006;
Int. Conf. on Foundations of Software Science and Computation Structures (FOSSACS), 2006;
ACM International Symposium on Component-Based Software Engineering (CBSE), 2006;
International Symposium on Software Composition (SC), 2006;
International Conference on Computer-Aided Verification (CAV), 2005;
International Symposium on Formal Methods (FM), 2005;
ACM International Symposium on Component-Based Software Engineering (CBSE), 2005;
Monterey Workshop: Software Engineering Tools, 2005

Other Referee (Grants/Awards)

Czech Science Foundation (GACR), 2011;
German Science Foundation (DFG), 2011;
ACM Student Research Competition at ICSE (ICSE-SRC), 2011;

The Netherlands Organization for Scientific Research (NWO), 2010;
Austrian Science Fund (FWF), 2009;
The Villum Kann Rasmussen Foundation, 2008;
ACM SIGPLAN 2006 Dissertation Award Committee, 2007;
Natural Sciences and Engineering Research Council of Canada (NSERC), 2007;
The Netherlands Organization for Scientific Research (NWO), 2005;
The Netherlands Organization for Scientific Research (NWO), 2004

Consultant in Industry

Argus Technologies Ltd., Burnaby, 2009
Alpha Technologies Ltd., Burnaby, 2008

Member of Professional Organizations

Association for Computing Machinery (ACM)
IEEE, IEEE Computer Society
Deutscher Hochschulverband (DHV)

Grants / Awards

1. NOKIA University Relations Grant, 2008 (in-kind donation of Nokia devices)
Title: *Teaching Software Engineering on Mobile Devices*
2. NSERC Discovery Grant, RGPIN 341819-07, 2007-2012 (120 000 CAD)
Title: *Automated Formal Methods for Reliable Software Components*
3. President's Research Grant, SFU/PRG 06-3, 2006 (10 000 CAD)
4. Start-Up Grant, SFU, 2006 (100 000 CAD)
5. DFG (German science foundation) Grant, BE 1761/3-1, 2003 (2 500 EUR)
6. Government Award for early completion of study (2 500 EUR)
7. Government Award for best graduates, all Germany (1 500 EUR)
8. BTU University Award 1998 for best Master's thesis

References

1. Thomas A. Henzinger, Professor, IST Austria, <http://pub.ist.ac.at/~tah>
2. Claus Lewerentz, Professor, BTU Cottbus, Germany, <http://www-sst.informatik.tu-cottbus.de>
3. Carlo Ghezzi, Professor, Politecnico di Milano, Italy, <http://home.dei.polimi.it/ghezzi>
4. Peter Naumann, Dr., Siemens AG, Business Services Dresden, Germany

Additional references are available on request.