

Curriculum Vitae – Ralf Huuck

Contact Information

Surname	Huuck
Name	Ralf
Date of Birth	October 20, 1971
Place of Birth	Kappeln, Germany
Nationality	German
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Research Interests

software engineering, embedded systems, formal specification and verification, domain specific languages, tools for (semi-)automatic program proving

Education

Ph.D., Computer Science, Christian-Albrechts-Universität zu Kiel, 2003.
Dissertation: Software Verification for Programmable Logic Controllers.
Referees: Yassine Lakhnech, Willem-Paul de Roever, Oded Maler, Thomas Wilke

M.Sc., Computer Science, Christian-Albrechts-Universität zu Kiel, 1998
Thesis: Transforming Timed Condition/Event Systems into Timed Automata:
An Approach to Automatic Verification.

Professional Experience

- 02/2004 – present *Researcher*
with Assoc. Prof. Ron van der Meyden,
National ICT Australia Ltd,
Sydney, Australia
- 05/2003 – 12/2003 *Visiting Research Fellow*
with Dr. Kai Engelhardt,
School of Computer Science and Engineering,
University of New South Wales, Sydney, Australia
- 03/1999 – 04/2003 *Research Associate*
with Prof. Willem-Paul de Roever,
Department of Computer Science and Applied
Mathematics, University of Kiel, Germany.
- 12/2001 – 01/2002 *Visiting Research Fellow*
with Dr. Wai Wong,
Department of Computer Science,
Hong Kong Baptist University, China.
- 05/2001 – 09/2001 *Visiting Research Fellow*
with Prof. Yassine Lakhnech,
Verimag, Grenoble, France.
- 06/1998 – 01/1999 *Research Assistant*
with Dr. Wai Wong,
Department of Computer Science,
Hong Kong Baptist University, China.
- 06/1996 – 08/1997 *Freelance Software Analyzer*
Deutsche System Technik GmbH, Kiel and
Gesellschaft für Software Entwicklung mbH, Mu-
nich, Germany.
- 1996 – 1998 *Tutor*
Department of Computer Science and Applied
Mathematics, University of Kiel, Germany.

Research Project Record

Principal Researcher

- [2005-2006] *Goanna Pilot Project*. NICTA internal.
- [2001-2003] *Integration of Software Specification Techniques for Applications in Engineering*, National DFG Special Program.
- [1999-2002] *KONDISK – Analysis and Synthesis of Continuous-Dicrete Systems*, National DFG Special Program.
- [1999-2001] *VHS –Verification of Hybrid Systems*, European ESPRIT Longterm Research Project, No. 26270.

Proposals Funded

- [2005-2006] *Goanna Pilot Project*. NICTA internal. Approx. US\$ 150,000.
- [2002-2004] *Formal Analysis of Sequential Function Charts*. Within the DFG Special Program: Integration of Software Specification Techniques for Applications in Engineering. Approx. US\$ 250,000.
- [2001-2002] *Integrated Algorithmic and Deductive Verification of Distributed Control Systems for Hybrid Processes*. Within the DFG Special Program: Analysis and Synthesis of Continuous-Dicrete Systems Approx. US\$ 250,000.

Teaching Experience

Teaching

- Algorithmic Verification
- Software Engineering
- Algorithms and Data Structures

Invited Talks

- [2004] *Sanity Checks for Stateflow Diagrams*. Synchronous Languages Symposium at Dagstuhl Castle, Germany.
- [2003] *Software Verification for Programmable Logic Controllers*. National ICT Australia (NICTA) formal methods programme, Inaugural Workshop, Sydney, Australia.
- [2003] *Software Verification for Programmable Logic Controllers*. National University of Singapore, Singapore.
- [2002] *Verification of Control Software*. The Annual Festival Colloquium of the Computer Science Department, University of Kiel, Germany.
- [2002] *Verification of Embedded Control Software*. United Nations University, International Institute for Software Technology, Macau, China.
- [2001] *Verification of Embedded Control Software*. Synchronous Languages Symposium at Dagstuhl Castle, Germany.
- [2001] *Verification of Automation Control Software*. Siemens AG, Munich, Germany.

Refereed Publications

Book Chapters

- Nanette Bauer, Ralf Huuck, Ben Lukoschus, Sebastian Engell. **A Unifying Semantics for Sequential Function Charts**. Integration of Software Specification Techniques for Applications in Engineering, Priority Program SoftSpez of the German Research Foundation (DFG), Final Report. *Lecture Notes in Computer Science 3147*, Springer 2004, pages 400-418. ISBN 3-540-23135-8.
- Nanette Bauer, Sebastian Engell, Ralf Huuck, Sven Lohmann, Ben Lukoschus, Manuel Remelhe, Olaf Stursberg. **Verification of PLC Programs given as Sequential Function Charts**. Integration of Software Specification Techniques for Applications in Engineering, Priority Program SoftSpez of the

German Research Foundation (DFG), Final Report. *Lecture Notes in Computer Science 3147*, Springer 2004, pages 517-540. ISBN 3-540-23135-8.

- Ralf Huuck, Ben Lukoschus, Goran Frehse, and Sebastian Engell. **Compositional Verification of Continuous-Discrete Systems**. In *Modelling, Analysis and Design of Hybrid Systems, Lecture Notes in Control and Information Sciences 279*, pages 225-246. Springer-Verlag, 2002. ISBN 3-540-43812-2
- Ralf Huuck, Yassine Lakhnech, Ben Lukoschus, Luis Urbina, Sebastian Engell, Stefan Kowalewski, and Jörg Preußig. **Integrating Timed Condition/Event Systems and Timed Automata for the Verification of Hybrid Systems**. Lonnie R. Welch and Dieter K. Hammer (eds.), *Engineering of Distributed Control Systems*, pages 59-80. Nova Science Publishers, Inc., 2001. ISBN 1-69033102-8.

Journal Articles

- Ralf Huuck. **Semantics and Analysis of Instruction List Programs**. Proceedings of the Second Workshop on Semantic Foundations of Engineering Design Languages (SFEDL 2004). *Electronic Notes in Theoretical Computer Science 115*, Elsevier 2005, pages 3-18.
- Ralf Huuck, Ben Lukoschus, and Yassine Lakhnech. **Verifying Untimed and Timed Aspects of the Experimental Batch Plant**. *European Journal of Control*, 7(4):400-415, September 2001. Special Issue: Verification of Hybrid Systems - Results of a European Union Esprit Project. Hermes Science Publishing. ISSN 0947-3580.
- Stefan Kowalewski, Peter Herrmann, Sebastian Engell, Heiko Krumm, Heinz Treseler, Yassine Lakhnech, Ralf Huuck, and Ben Lukoschus. **Approaches to the Formal Verification of Hybrid Systems**. *Journal at-Automatisierungstechnik*, 49(2):66-74, February 2001. Special Issue: Hybrid Systems II: Analysis, Modeling, and Verification. Oldenbourg Verlag. ISSN 0178-2312.
- Ralf Huuck, Yassine Lakhnech, Ben Lukoschus, Luis Urbina, Sebastian Engell, Stefan Kowalewski, and Jörg Preußig. **Integrating Timed Condition/Event Systems and Timed Automata for the Verification of Hybrid Systems**. *Parallel and Distributed Computing Practices*, 1(2):45-60, June 1998. (same as book chapter above)

Invited Conference Papers

- Ralf Huuck, Ben Lukoschus, and Nanette Bauer. **A Model-Checking Approach to Safe SFCs.** In the proceedings of *CESA 2003: IEEE Computational Engineering in Systems Application*, Lille, France, July 9-11, 2003.
- Ralf Huuck, Ben Lukoschus, and Nanette Bauer. **A Stopwatch Semantics for Hybrid Controllers.** In the proceedings of *b'02: The XV. IFAC World Congress*, Barcelona, Spain, July 21-26, 2002.
- Goran Frehse, Ralf Huuck, Olaf Stursberg, Sebastian Engell, and Ben Lukoschus. **Modular Analysis of Discrete Controllers for Distributed Hybrid Systems.** In the proceedings of *b'02: The XV. IFAC World Congress*, Barcelona, Spain, July 21-26, 2002.
- Ralf Huuck, Ben Lukoschus, Sébastien Bornot, and Yassine Lakhnech. **An Abstract Model For Sequential Function Charts.** *Discrete Event Systems: Analysis and Control, Proceedings of WODES 2000: 5th Workshop on Discrete Event Systems*, Ghent, Belgium, August 21-23, 2000, pages 255-264, Boston, Dordrecht, London, 2000. Kluwer Academic Publishers. ISBN 0-7923-7897-0.

Regular Conference Papers

- Gerwin Klein, Ralf Huuck. **High Assurance System Software.** In the proceedings of *10th Australian Workshop on Safety Critical Systems and Software*. Sydney, 2005. To appear.
- Ralf Huuck **Software Verification for Embedded Systems.** In the proceedings of *MMAR '02: The 8th IEEE International Conference on Methods and Models in Automation and Robotics*, Szczecin, Poland, 2-5 September 2002.
- Ralf Huuck, Nanette Bauer. **A Parameterized Semantics for Sequential Function Charts.** In the proceedings of the Workshop of *Semantic Foundations of Engineering Design Languages (SFEDL) 2002*, Grenoble, France, Satellite Event of ETAPS 2002, 6-14.4.2002.
- Ralf Huuck, Nanette Bauer. **Towards Automatic Verification of Embedded Control Software.** In the proceedings of *IEEE Asian Pacific Conference on Quality Software*, Hong Kong, China, 2001.

- Goran Frehse, Olaf Stursberg, Sebastian Engell, Ralf Huuck, and Ben Lukoschus. **Verification of Hybrid Controlled Processing Systems based on Decomposition and Deduction.** *ISIC 2001: 2001 IEEE International Symposium on Intelligent Control*, Mexico City, Mexico, September 5-7, 2001, pages 150-155. IEEE Press. ISBN 0-7803-6733-2 (CD-ROM: 0-7803-6735-9).
- Ralf Huuck, Ben Lukoschus, Sébastien Bornot, and Yassine Lakhnech. **Utilizing Static Analysis for Programmable Logic Controllers.** *ADPM 2000: The 4th International Conference on Automation of Mixed Processes: Hybrid Dynamic Systems*, Dortmund, Germany, September 18-19, 2000, pages 183-187, Aachen, Germany, 2000. Shaker Verlag. ISSN 0945-4659, ISBN 3-8265-7836-8.
- Ralf Huuck, Ben Lukoschus, Sébastien Bornot, and Yassine Lakhnech. **Verification of Sequential Function Charts using SMV.** *PDPTA 2000: International Conference on Parallel and Distributed Processing Techniques and Applications*, Monte Carlo Resort, Las Vegas, Nevada, USA, June 26-29, 2000, volume V, pages 2987-2993. CSREA Press, June 2000. ISBN 1-892512-51-3.
- Ralf Huuck, Ben Lukoschus, and Sébastien Bornot. **Statische Analysetechniken für speicherprogrammierbare Steuerungen.** *FBT 2000 - 10. GI/ITG-Fachgespräch "Formale Beschreibungstechniken" der Gesellschaft für Informatik (GI), Informationstechnische Gesellschaft im VDE (ITG), Fachgruppe "Kommunikation und Verteilte Systeme"*, Lübeck, Germany, June 22/23, 2000.
- Stefan Kowalewski, Sebastian Engell, Ralf Huuck, Yassine Lakhnech, Ben Lukoschus, and Luis Urbina. **Using Model-Checking for Timed Automata to Parameterize Logic Control Programs.** *ESCAPE 8: 8th European Symposium on Computer Aided Process Engineering*, Brugge, Belgium, May 24-27, 1998, volume 22 (issue 1001) of *Computers & Chemical Engineering*, pages S875-S878. Elsevier Science, 1998.
- Ralf Huuck, Yassine Lakhnech, Luis Urbina, Sebastian Engell, Stefan Kowalewski and Jörg Preußig. **Comparing Timed C/E Systems with Timed Automata.** *Proceedings Int. Workshop on Hybrid and Real-Time Systems (HART'97)*, Grenoble, France, March 26-28, 1997, Lecture Notes in Computer Science 1201, Springer, pp. 81-86.

- Ralf Huuck, Yassine Lakhnech, Luis Urbina, Sebastian Engell, Stefan Kowalewski and Jörg Preußig. **Combining a Computer Science and a Control Theory Approach to the Verification of Hybrid Systems.** *5th Int. Workshop on Parallel and Distributed Real-Time Systems (WPDRTS'97)*, Geneva, Switzerland, April 1-3,1997, IEEE Computer Society, ISBN 0-8186-8096-2/97.
- Stefan Kowalewski, Jörg Preußig, Sebastian Engell, Ralf Huuck, Yassine Lakhnech, and Ben Lukoschus. **Analyse zeitbewerteter Bedingung/Ereignis-Systeme mittels Echtzeitautomaten-Tools.** *5. Fachtagung Entwurf komplexer Automatisierungssysteme (EKA '97)*, 1:180-194, Braunschweig, Germany, May 1997.