

# Curriculum Vitae

*Frits Willem Vaandrager*

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## Personal Facts

*FULL NAME:* Frits Willem Vaandrager  
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*BORN:* July 22, 1962, Voorschoten, The Netherlands  
*NATIONALITY:* Dutch  
*MARITAL STATUS:* Married, three children

## Research Interests

One of my long term research objectives is to help to give the new discipline of (*computer based*) *system engineering* a sound mathematical basis. I have a strong interest in the development and application of theory, methods and tools for the specification and verification of computer based systems. In particular, I am interested in the analysis of embedded systems, distributed algorithms and protocols. For more information on my research, see the project descriptions accessible via my webpage.

## Education

- Ph.D. in Computer Science, University of Amsterdam, February 1990. Thesis title: *Algebraic techniques for concurrency and their application*; supervisor: Prof. J.A. Bergstra.
- M.S. in Mathematics with specialization in Computer Science, University of Leiden, June 1985. Thesis title: *Verification of two communication protocols by means of process algebra*; supervisors: Prof. J.A. Bergstra and Prof. A. Ollongren.

## Employment

- Full professor of Informatics for Technical Applications, Institute for Computing and Information Sciences, Radboud University Nijmegen. December 1995 – present.  
WWW: <http://www.mbsd.cs.ru.nl>.
- Group leader of the project “Concurrency and Real-Time Systems”, Department of Software Technology (Prof. J.W. de Bakker), Centrum voor Wiskunde en Informatica (CWI), Amsterdam. April 1992 – December 1995.
- Part-time “Universitair Hoofddocent” (Associate professor), Programming Research Group, University of Amsterdam. April 1992 – March 1995.
- “Maître de Recherche Associé” (Postdoctoral Associate), Project MEIJE (Dr. G. Berry), Centre de Mathématiques Appliquées (CMA), École Nationale Supérieure des Mines de Paris, Sophia-Antipolis, France. October 1991 – March 1992.
- Postdoctoral Associate, Theory of Distributed Systems research group (Prof. N.A. Lynch), Massachusetts Institute of Technology (MIT), Laboratory for Computer Science, Cambridge, MA, USA. September 1990 – August 1991.
- “Wetenschappelijk Medewerker” (Research Scientist), Department of Software Technology (Prof. J.W. de Bakker), Centrum voor Wiskunde en Informatica (CWI), Amsterdam. July 1985 – June 1990.

## Teaching Experience

- 8 day course for PhD students on Theory and Application of Timed Automata Model Checking at the University of Pisa, May 2011.
- Masterclass on Model Checking for high school students at various places, since 2007.
- Course on Introduction to Robotics since 2009 (together with Louis Vuurpijl and Pim Haselager).
- Course on Systems Architecture: Processors and Processes since 2008.
- Course on Analysis of Embedded Systems since 2006.
- Course on Processes and Concurrency from 2005 to 2007.
- Course on Protocol Validation from 1997 to 2005.
- Course on Operating Systems in 1996, 1997, 1998 and 2000.
- Course on system modelling for Philips Research, Spring 1999.
- Courses on process algebra and on protocol verification at the University of Amsterdam in 1987, 1989, 1992, 1993 and 1994 (2×).
- BSc and MSc supervisor of numerous students at the Radboud University Nijmegen.
- M.S. supervisor of several students at the University of Amsterdam.

## PhD students

1. Fides Aarts, since January 2010.
2. Freek Verbeek (co-promotor: dr J. Schmaltz), since October 2008.
3. Georgeta Igna, since December 2007.
4. Faranek Heydarian, since January 2008.
5. Lars Frantzen (co-promotor: dr J. Tretmans), PhD defense expected in 2012.

6. Jasper Berendsen. *Abstraction, Prices and Probability in Model Checking Timed Automata*, Radboud University Nijmegen, November 2010.
7. Marcel Verhoef (co-promotor: dr J.J.M. Hooman). *Modeling and Validating Distributed Embedded Real-Time Control Systems*, Radboud University Nijmegen, January 2009.
8. A.L. de Groot (co-promotor: dr J.J.M. Hooman). *Practical Automaton Proofs in PVS*, Radboud University Nijmegen, March 2008.
9. Biniam Gebremichael. *Expressiveness of Timed Automata Models*, Radboud University Nijmegen, December 2006.
10. Ling Cheung. *Reconciling Nondeterministic and Probabilistic Choices*, Radboud University Nijmegen, September 2006. (Cum Laude)
11. Martijn Hendriks. *Model Checking Timed Automata: Techniques and Applications*, Radboud University Nijmegen, April 2006.
12. Goran Frehse. *Compositional Verification of Hybrid Systems Using Simulation Relations*, Radboud University Nijmegen, October 2005. Second promotor: Prof.Dr.-Ing. S. Engell, University of Dortmund.
13. M.I.A. Stoelinga. *Alea Jacta Est: Verification of Probabilistic, Real-Time and Parametric Systems*, University of Nijmegen, April 2002.
14. A. Fehnker. *Citius, Vilius, Melius: Guiding and Cost-Optimality in Model Checking of Timed and Hybrid Systems*, University of Nijmegen, April 2002. (Cum Laude)
15. W.O.D. Griffioen. *Studies in Computer Aided Verification*, University of Nijmegen, May 2000.
16. J.M.T. Romijn. *Analysing Industrial Protocols with Formal Methods*, University of Twente, October 1999. First promotor Prof. H. Brinksma, University of Twente.
17. M.S. klein Gebbinck. *Decomposition of mixed pixels in remote sensing images to improve the area estimation of agricultural fields*, University of Nijmegen, November 1998. Co-promotor dr. Th. Schouten, University of Nijmegen.

18. F.J.M. Panken.  
*Design and performance evaluation of multiple-access protocols for ATM-based passive optical networks*, University of Nijmegen, November 1997.  
Co-promotor dr. C. Blondia, University of Antwerp, Belgium.

## Quality Indicators

1. In March 2010, an international committee assessed the research quality of Computer Science in the Netherlands. The Model-based System Development (MBSD) group received the maximal score of 5 for quality, relevance, and vitality and feasibility, and a score of 4.5 for the research program and productivity.
2. Mariëlle Stoelinga received the 2008 Professor De Winter prize for the article L. Cheung, M.I.A. Stoelinga and F.W. Vaandrager. A Testing Scenario for Probabilistic Processes. *Journal of the ACM* 54(6), December 2007. The Professor De Winter prize (2500 euro) is awarded for the best journal paper co-authored by a female researcher at the University of Twente.
3. My h-index according to Google Scholar is 40 (November 2011).
4. In May 2004, an international committee under auspices of QANU evaluated the research in Computer Science in the Netherlands. The research program of my Informatics for Technical Applications (ITA) group was singled out as *Excellent* (in fact ITA was the only group that received the maximal score of 5) and the quality of research was judged to be *Very Good*.
5. Best paper award ICALP'03 (Track B).
6. Best paper award FTRTFT'94.

## European Projects

1. EU FP7 project Quantitative System Properties in Model-Driven-Design of Embedded Systems (QUASIMODO), January 2008 - December 2010.
2. Overseas collaborator in the project Formal Methods for the Specification and Verification of Ad Hoc Networks (PROODOS). Department

of Computer Science, University of Cyprus (Anna Philippou, Chryssis Georgiou), January 2006 - December 2007.

3. DFG/NWO bilateral cooperation project Validation of Stochastic Systems (VOSS2). January 2005 - December 2007.
4. EU IST Project IST-2001-35304, Advanced Methods for Timed Systems (AMETIST). April 2002 - March 2005. Coordinator. This project has a budget that exceeds 2 M Euro and involves 4 industrial and 7 academic partners.
5. DFG/NWO bilateral cooperation project Validation of Stochastic Systems (VOSS). March 2001 - February 2004.
6. Esprit Project 26270, Verification of Hybrid Systems (VHS). May 1998 - October 2001.
7. HCM Cooperation Network CT930406, Expressiveness of Languages for Concurrency (EXPRESS). January 1994 – December 1997. (Coordinator of this project from January 1994 – January 1996)
8. European Research Action on Verification and Validation Methods for Formal Descriptions (COST Project 247). January 94 – December 1995.
9. ESPRIT Basic Research Action no. 7166, Calculi and Algebras of Concurrency: Extensions, Tools and Applications (CONCUR2). September 1992 – August 1995. (Scientific manager)
10. RACE project no. 2076, Broadband Object-Oriented Service Technology (BOOST). April 1992 – December 1994.
11. RACE project no. 1046, Specification and Programming Environment for Communications Software (SPECS). March 1988 – June 1990, April 1992 – December 1992.
12. ESPRIT Basic Research Action no. 3006, Theories of Concurrency: Unification and Extension (CONCUR). March 1990 – June 1990.
13. ESPRIT project no. 1283, VDM Specification for the Interface of the Portable Common Tool Environment (VIP). November 1986 – December 1988.

14. ESPRIT project no. 432, An Integrated Formal Approach to Industrial Software Development (METEOR). July 1985 – October 1989.

## National Grants

1. STW project “Integrating Testing And Learning of Interface Automata (ITALIA)” (together with J. Tretmans). 2 PhD students, starting end 2011.
2. KWR project FATs Domino “Automatic test case generation and test execution for software and System-on-Chip platform development in printers and copiers using model based testing (FATs Domino)” (together with J. Tretmans, P. Koopman and Océ). 1 junior researcher for 9 months. From January 2010 - December 2010.
3. NWO/EW project “Formal Verification of Deadlock Avoidance Mechanisms (FVDAM)”. 1 PhD student. Four years, starting end 2008. (Together with Julien Schmaltz)
4. NWO/EW project 612.064.610 “Abstraction Refinement for Timed Systems (ARTS)”. 1 PhD student. From January 2008 - December 2011.
5. ESI project Octopus. 1 PhD student from December 2007 until November 2011, plus 1 postdoc for 2 years from the end of 2009 onwards.
6. NWO Focus project Advancing the Real use of Proof Assistants (ARPA). 1 postdoc (together with prof. H. Geuvers). From 1/9/2005 to 1/9/2009.
7. ESI project Beyond the Ordinary: Design of Embedded Real-time Control (BODERC). End of 2002 - March 2007.
8. NWO/GBE project 612.000.103 “FRAAI: Fault-tolerant Real-time Algorithms Analyzed Incrementally” (together with Dr. J.J.M. Hooman, University of Nijmegen). 2001-2010.
9. PROGRESS project TES4999 “HaaST: Verification of Hard and Softly Timed Systems” (together with Prof. H. Brinksma, University of Twente, and dr. R. Koymans, Philips Research Laboratories). From 1/9/1999 until 1/4/2004.

10. SION project 612-14-007 “JaCo: Reasoning about Concurrency in Java” (together with Dr. B.P.F. Jacobs, University of Nijmegen).
11. SION project 612-10-003 “Validation of Programmable Logic Controllers” (together with Dr. A. Mader and Dr. H. Wupper, University of Nijmegen).
12. KNAW project “Object-Oriented and Hybrid Systems: Specification, Realization and Verification” (Primary researcher: Dr. B.P.F. Jacobs).
13. SION project 612-14-004 “Stepwise Refinement of Hybrid Systems”, April 1997 - April 2001.
14. Philips project “Specification, Testing and Verification of Software for Technical Applications” (together with Prof. H. Brinksma, University of Twente, and Dr. J.F. Groote, CWI). May 1995 – April 1999.
15. SION project 612-33-006 “Testing and Verification of Timed Systems” (together with Prof. H. Brinksma, University of Twente). June 1995 – May 1997.
16. SION project 612-316-125 “Checking Verifications of Concurrent Systems with Type Theory Tools” (together with Dr. J.F. Groote, CWI). June 1994 – June 1998.

## **Programme/Steering Committees**

1. 15th ACM Conference on Languages, Compilers, Tools & Theory for Embedded Systems (LCTES 2012), June 12-13, Beijing, China.
2. 6th International Conference on Language and Automata Theory and Applications (LATA 2012), March 5-9, 2012, A Coruña, Spain.
3. 13th ACM International Conference on Hybrid Systems: Computation and Control (HSCC’10), in conjunction with CPSWEEK, April 12-16, 2010, Stockholm.
4. Doctoral Symposium of FM’09, Eindhoven, The Netherlands, Friday November 6, 2009.

5. 7th International Conference on Formal Modelling and Analysis of Timed Systems (FORMATS'09), Technical University of Budapest, 13th-16th September, 2009. (PC co-chair, tother with Joël Ouaknine).
6. Program Board for Computer Science of the Lorentz Center. Since January 2003.
7. Tools and Algorithms for the Construction and Analysis of Systems (TACAS 2009), 22-29 March 2009, York, UK.
8. 29th IEEE Real-Time Systems Symposium (RTSS 2008), Barcelona, Spain, November 30 - December 3, 2008.
9. 6th International Conference on Formal Modelling and Analysis of Timed Systems (FORMATS'08), Saint-Malo, France, September 15-17, 2008.
10. Jury ICTRegie Award 2008.
11. Scientific coordinator of Lorentz Center workshop “Two decades of probabilistic verification – Reflections and perspectives”, Leiden, November 12-16, 2007
12. 5th International Conference on Formal Modelling and Analysis of Timed Systems (FORMATS'07), Salzburg, Austria, October 3-5, 2007.
13. 7th ACM International Conference on Embedded Software (EMSOFT 2007), Salzburg, Austria, Sept 30 - Oct 5, 2007.
14. Track B “Logic, Semantics, and Theory of Programming” of the 34th International Colloquium on Automata, Languages and Programming (ICALP 2007), Wroclaw, Poland, July 9-14, 2007.
15. 19th International Conference on Computer Aided Verification (CAV 2007), Berlin, Germany, July 3-7, 2007.
16. IPA Herfstdagen on Stochastic Systems, Bergen (NH), the Netherlands, November 27 - December 1, 2006.
17. 6th ACM International Conference on Embedded Software (EMSOFT 2006), Seoul, South Korea, October 22-29, 2006.

18. 20th Annual Conference on Distributed Computing (DISC 2006), Stockholm Sweden, September 18-20, 2006.
19. 2nd IFAC conference on the Analysis and Design of Hybrid Systems (ADHS'06), Alghero, Sardinia, Italy, June 7-9, 2006.
20. 3rd international conference on Formal Modeling and Analysis of Timed Systems (FORMATS'05), Uppsala, Sweden, September/October 2005.
21. Seventh International Conference on Concurrency Theory (CONCUR'05), San Francisco, California, August 23-26, 2005.
22. Scientific committee of MOdelling and VERifying parallel Processes (MOVEP'04), Brussels, Belgium, December 13-17, 2004.
23. 16th Conference on Computer Aided Verification (CAV'04), Boston, Massachusetts, July 14-17, 2004.
24. Jury International Conference of Young Scientists (ICYS 2004), Nijmegen, the Netherlands, April 18-24, 2004.
25. Seventh International Workshop on Hybrid Systems: Computation and Control (HSCC'04), Philadelphia, USA, March 2004.
26. Program Committee First International Workshop on Formal Modeling and Analysis of Timed Systems (FORMATS 2003), September 6-7 2003, Marseille, France.
27. Andrei Ershov Fifth International Conference on Perspectives of System Informatics (PSI'03), July 9-12, 2003, Novosibirsk, Akademgorodok, Russia.
28. IFAC Conference on Analysis and Design of Hybrid Systems (ADHS'03), June 16-18, 2003, Saint-Malo Brittany, France.
29. GI/Dagstuhl Research Seminar on Validation of Stochastic Systems, December 8-11, 2002, Schloss Dagstuhl, Germany.
30. Fifth International Workshop on Hybrid Systems: Computation and Control (HSCC'02), Stanford, CA, USA, March 2002.

31. Foundations of Software Science and Computation Structures (FOS-SACS'02), Grenoble, France, March/April 2002.
32. Steering Committee of Workshop Series Hybrid Systems: Computation and Control (HSCC). 1999–2001.
33. Fourth International Workshop on Hybrid Systems: Computation and Control (HSCC'01), Roma, Italy, March 28-30, 2001.
34. The 4th International Conference on Automation of Mixed Processes: Hybrid Dynamical Systems (ADPM2000), Dortmund, Germany, September 16–18, 2000.
35. 5th Workshop on Discrete Event Systems (WODES2000), Ghent, Belgium, August 21–23, 2000.
36. Third International Workshop on Hybrid Systems: Computation and Control (HSCC'00), Pittsburgh, PA, USA, March 23–25, 2000.
37. Nederlandse Testdag, Eindhoven, The Netherlands, November 3, 1999.
38. Second International Workshop on Hybrid Systems: Computation and Control (HSCC'99), Nijmegen/Berg en Dal, The Netherlands, March 29–31, 1999. (co-chair, together with J. van Schuppen, CWI)
39. Nederlandse Testdag, Enschede, The Netherlands, October 15, 1998.
40. International Colloquium on Automata, Languages and Programming (ICALP'98), Aalborg, Denmark, 13-17 July 1998.
41. Fourth International Workshop on Tools and Algorithms for the Construction and Analysis of Systems (TACAS'98), Lisbon, Portugal, March 31 - April 2, 1998.
42. IFIP Working Conference on Programming Concepts and Methods (PROCOMET'98), Shelter Island, New York, USA, 8-12 June 1998.
43. Fourth Workshop on Expressiveness in Concurrency (EXPRESS'97), Santa Margherita Ligure, Italy, 8-12 September 1997.
44. Ninth Conference on Computer-Aided Verification (CAV'97), Haifa, Israel, June 22-25, 1997.

45. Third International Workshop on Tools and Algorithms for the Construction and Analysis of Systems (TACAS'97), Enschede, The Netherlands, April 2-4, 1997.
46. International Symposium on Theoretical Aspects of Computer Software (TACS'97), Sendai, Japan, September 24-26, 1997.
47. International Workshop on Hybrid and Real-Time Systems (HART'97), Grenoble, France, March 26-28, 1997.
48. European Educational Forum School on Embedded Systems, Veldhoven, The Netherlands, November 25-29, 1996. (Chairman)
49. Seventh International Conference on Concurrency Theory (CONCUR'96), Volterra, Italy, August 26-29, 1996.
50. Eighth Conference on Computer-Aided Verification (CAV'96), New Brunswick, New Jersey, USA, July 31 - August 3, 1996.
51. Second International Workshop on Tools and Algorithms for the Construction and Analysis of Systems (TACAS'96), Passau, Germany, March 27-29, 1996.
52. Fourth International Conference on Algebraic Methodology and Software Technology (AMAST'95), Montreal, Canada, June 3-7, 1995.
53. Fifteenth IEEE Real-Time Systems Symposium (RTSS'94), San Juan, Puerto Rico, December 7-9, 1994.
54. Fifth International Conference on Concurrency Theory (CONCUR'94), Uppsala, Sweden, August 22-25, 1994.
55. North American Process Algebra Workshop (NAPAW'93), Ithaca, NY, USA, August 15, 1993.
56. Fourth International Conference on Concurrency Theory (CONCUR'93), Hildesheim, Germany, August 23-26, 1993.
57. Third International Conference on Algebraic Methodology and Software Technology (AMAST'93), Twente, June 22-25, 1993.

58. Second International Symposium on Logical Foundations of Computer Science (Tver'92), Sokol, Tver region, Russia, July 20-24, 1992.
59. Second International Conference on Concurrency Theory (CONCUR'91), Amsterdam, August 26-29, 1991.

## **Membership of Professional Organizations**

- IFAC Technical Committee TC 1.3 on Discrete Event and Hybrid Systems.
- Member IPA, Dutch Graduate School “Institute for Programming research and Algorithmics”.
- Member Nederlandse Vereniging voor Theoretische Informatica (NVTI, Society for Theoretical Computer Science in the Netherlands).
- Member European Association for Theoretical Computer Science (EATCS).
- Member Association for Computing Machinery (ACM).
- Member Institute of Electrical and Electronics Engineers (IEEE).
- Member emeritus IFIP Working Group 2.2 on Formal Description of Programming Concepts.

## **Other Professional Activities**

- Member committee midterm research evaluation Computer Science departments 3TU, period 2009-2012
- Member Gebiedsbestuur Exacte Wetenschappen NWO, (committee within the Netherlands Organisation for Scientific Research responsible for mathematics, computing science and astronomy), since September 2006.
- Member evaluation committee STW Perspectief, 2011.
- Reviewer EU IST project STREP 215543 COMponent-Based Embedded Systems design Techniques (COMBEST).
- Member program board Honours Programme Faculty of Science Radboud University, Fall 2008 - July 2011.

- External expert for assessing candidates for Chair in Embedded Systems, Uppsala University, Sweden, Fall 2008.
- Coordinator team for attracting new students in Computer/Information Sciences, since September 2007.
- Editor *Information and Computation*, since 2003.
- Editor *Logical Methods in Computer Science (LMCS)*, since 2004.
- Member Review Panel DFG Transregional Collaborative Research Centre Sonderforschungsbereich/Transregio 14 “AVACS - Automatic Verification and Analysis of Complex Systems”, September 2007.
- Member counselling committee for NWO research project “Developing bibliometric indicators of research performance in Computer Science”, May 2003 - May 2007.
- Coordinator specialization “embedded systems” in Computer Science MSc programme.
- Member “College van Beroep voor de Examens van de Radboud Universiteit Nijmegen”. Since June 2000.
- Member of panel evaluating applications in Electrical Engineering for the Academy of Finland, August 2005.
- Head of Computing Science Department, University of Nijmegen, May 2001 – April 2004. During my term, amongst others,
  - The Nijmegen Institute for Computing and Information Sciences (Nijmeegs Instituut voor Informatica en Informatiekunde, NIII) was founded.
  - A 1.8 MEuro Pionier grant was awarded to dr. B.P.F. Jacobs (in 2001).
  - A 1.5 MEuro Spinoza prize was awarded to prof.dr. H. Barendregt (in 2002).
  - The number of people in the department employed through external funding rose from 7.40 fte in 2001 to approximately 30 fte in 2004.

- Assessments of education (2002) and research (2003) took place, organized by the VSNU, both with generally quite positive results.
- Director of Education, Computing Science Department, University of Nijmegen, May 2001 – May 2003. During my term, amongst others,
  - A new curriculum in Information Science was started (in 2001).
  - In 2002, a Review Committee appointed by the VSNU carried out a quality assessment of education in Computer Science in the Netherlands. In their report the Committee states (p112):
 

De commissie meent dat met het aantreden van het nieuwe subfaculteitsbestuur in 2001 en met het van start gaan van het Nijmeegs Instituut voor Informatica en Informatiekunde (NIII) de opleiding in rustiger vaarwater is gekomen en dat er meer zicht is ontstaan op een heldere structuur van de organisatie van de opleiding en haar verhouding tot het onderzoek en tot de opleiding Informatiekunde. Met name de versterking van het onderwijsmanagement die heeft plaatsgevonden, wordt door de commissie hoog gewaardeerd. Zij meent dat de opleiding Informatica volledige steun vanuit het faculteitsbestuur verdient om op deze weg succesvol door te kunnen gaan.
- Member Adviescommissie Informatica, Gebiedsbestuur Exacte Wetenschappen, NWO. September 1998 - January 2003. Within this committee I was involved (amongst others) in the formulation of the influential national research agenda for computer science (Nationale Onderzoek-agenda Informatica 2001-2005, NOAG-i).
- Member executive committee PROGram for Research on Embedded Systems & Software (PROGRESS), January 2001 — January 2003. Within this committee I was involved (amongst others) in the formulation of the national roadmap for research on embedded systems, and the formulation of the 6 M Euro PROGRESS2 research programme funded by STW/NWO/EZ.
- Chair advisory board for appointment of Full Professor on Information Retrieval and Information Systems, University of Nijmegen, 2000.

- Author *Quality of Software — Formal Methods and Tools*, research profile for the Computing Science Institute (CSI) of the University of Nijmegen, March 2000.
- Advisory board for appointment of Named Professorship on Industrial Applications of Formal Methods, University of Twente, 1999.
- Advisory board for appointment of Full Professor on Embedded Systems, University of Eindhoven, 1999.
- Coordinator at the University of Nijmegen of the Philips course “From PhD in Sciences to Researcher in Computer Science”, from 31-08-1998 to 01-06-2000.
- Member of Committee of Experts for the evaluation of the research programme 1C “Programmation distribuée et temps-réels” of INRIA, Saint-Malo, France, October 6-7, 1998.
- Member Evaluation Committee Research Proposals of the Dutch Organization for Computer Science Research, BCO SION (Beoordelingscommissie Onderzoekvoorstellen van de Stichting Informatica-Onderzoek in Nederland), May 1996 – December 1997.
- From October 1992 – November 1997: Moderator of CONCURRENCY email forum ([concurrency@cwil.nl](mailto:concurrency@cwil.nl)). Active forum focusing on concurrency theory, with about 1000 subscribers from 36 countries.
- Referee of research proposals for ESPRIT Basic Research, SION, STW, PROGRESS, the Academy of Finland, the Swiss National Science Foundation, and NSF, and of a large number of papers submitted to the journals *Acta Informatica*, *Formal Aspects of Computing*, *Formal Methods in System Design*, *Fundamenta Informaticae*, *Information and Computation*, *Information Processing Letters*, *Journal of Computer and System Sciences*, *Methods of Logic in Computer Science*, *Software Tools for Technology Transfer*, *Theoretical Computer Science*, and *ACM Transactions on Programming Languages and Systems*. Also acted as referee for numerous conferences, including AMAST, CAAP, CAV, CONCUR, CSN, ESOP, FOSSACS, FST&TCS, FTRTFT, HSCC, ICALP, ICTL, LICS, PARLE, PODC, PROCOMET, PSTV, RTSS, STACS, TACAS, TACS, TAPSOFT and TYPES.

## Dissertations

1. Chair manuscript committee Ph.D. thesis Miguel E. Andrés, *Information Leakage in Probabilistic and Nondeterministic Systems*, Radboud University Nijmegen, 2011.
2. Member promotion committee Marijn Jongerden, *Model-based energy analysis of battery powered systems*, University of Twente, December 10, 2010.
3. Chair manuscript committee Ph.D. thesis Jan Martin Jansen, *Functional Web Applications — Implementation and Use of Client Side Interpreters*, Radboud University Nijmegen, July 2010.
4. Member promotion committee Gianluigi Folino, *High Performance Data Mining using Bio-inspired Techniques*, Radboud University Nijmegen, March 2010.
5. Member promotion committee Sicco Verwer, *Efficient identification of Timed Automata — Theory and Practice*, Technische Universiteit Delft, March 2, 2010.
6. Member promotion committee Tingting Han, *Diagnosis, Synthesis and Analysis of Probabilistic Models*, University of Twente, September 25, 2009.
7. Opposition at Ph.D. defense Joachim van den Berg, *Reasoning about Java programs in PVS using JML*, Radboud University Nijmegen, July 2009.
8. Opposition at Ph.D. defense Sietse Overbeek, *Bridging Supply and Demand for Knowledge Intensive Tasks Based on Knowledge, Cognition, and Quality*, Radboud University Nijmegen, April 2009.
9. Opposition at Ph.D. defense Ichiro Hasuo, *Tracing Anonymity with Coalgebras*, Radboud University Nijmegen, March 2008.
10. Chair manuscript committee Ph.D. thesis Arjen Hommersom, *On the Application of Formal Methods to Clinical Guidelines, an Artificial Intelligence Perspective*, Radboud University Nijmegen, 2008.

11. Chair manuscript committee Ph.D. thesis Wolter Pieters, *La Volonté Machinale — Understanding the Electronic Voting Controversy*, Radboud University Nijmegen, 2008.
12. Opposition at Ph.D. defense Arjan van Weelden, *Putting Types to Good Use*, Radboud University Nijmegen, October 2007.
13. External opponent at Ph.D. defense Jacob Illum Rasmussen, *How Do You Measure Up? Quantitative Analysis of Real-Time Systems*, University of Aalborg, Denmark, June 2007.
14. Member manuscript committee and opposition at Ph.D. defense Tomas Krilavičius, *Hybrid Techniques for Hybrid Systems*, University of Twente, September 2006.
15. Opposition at Ph.D. defense Mihály Petreczky, *Realization Theory of Hybrid Systems*, Free University, Amsterdam, June 2006.
16. Opposition at Ph.D. defense Cees-Bart Breunesse, *On JML: Topics in Tool-Assisted Verification of Java Programs*, Radboud University Nijmegen, April 2006.
17. Opposition at Ph.D. defense Mohammadreza Mousavi, *Structuring Structural Operational Semantics*, University of Eindhoven, September 2005.
18. Rapporteur Ph.D. thesis Sarah Zennou, *Méthodes d'ordre partiel pour la vérification de systèmes concurrents et temps réel*, University Aix-Marseille I, December 2004.
19. Opposition at Ph.D. defense Pieter Cuijpers, *Hybrid Process Algebra*, University of Eindhoven, December 2004.
20. Opposition at Ph.D. defense Luíz Cruz-Filipe, *Constructive Real-Analysis: a Type-Theoretical Formalization and Applications*, University of Nijmegen, June 2004.
21. Opposition at Ph.D. defense Tim Willemse, *Semantics and Verification in Process Algebras with Data and Timing*, University of Eindhoven, February 2003.

22. Examiner of Ph.D. thesis Mauno Rönkkö, *Stepwise Development of Hybrid Systems*, Turku Centre for Computer Science, Department of Computer Science, Åbo Akademi University, November 2001.
23. Opposition at Ph.D. defense Ruud van Dael, *'Iets met computers' — Over beroepsvorming van de informaticus*, University of Nijmegen, February 2001.
24. Opposition at Ph.D. defense Marieke Huisman, *Java Program Verification in Higher-Order Logic with PVS and Isabelle*, University of Nijmegen, February 2001.
25. External examiner Ph.D. thesis Jeremy Sproston, *Model Checking of Probabilistic Timed and Hybrid Systems*, University of Birmingham, UK, January 2001.
26. Opposition at Ph.D. defense Paul Jones, *Best First Search & Document Processing Applications*, University of Nijmegen, November 2000.
27. Promotion committee Bernd Wundergem, *Compact and Tractable Descriptors for Information Discovery*, University of Nijmegen, October 2000.
28. Reading committee Tanja Vos, *UNITY in Diversity — A Stratified Approach to the Verification of Distributed Algorithms*, University of Utrecht, Januari 2000.
29. Graduation committee Ph.D. thesis Pedro R. D'Argenio, *Algebras and Automata for Timed and Stochastic Systems*, University of Twente, November 1999.
30. External examiner Ph.D. thesis Henrik Jensen, *Abstraction-Based Verification of Distributed Systems*, Aalborg University, October 1999.
31. Promotion committee Ph.D. thesis Georgina Fábíán, *A Language and Simulator for Hybrid Systems*, University of Eindhoven, September 1999.
32. Opposition at Ph.D. defense W. Alberts and G. Naumoski, *A Discrete Event Simulator for Systems Engineering*, University of Eindhoven, May 1998.

33. Opposition at Ph.D. defense Louis Vuurpijl, *Platforms for Artificial Neural Networks — Neurosimulators and Performance Prediction of MIMD-Parallel Systems*, University of Nijmegen, Februari 1998.
34. Ph.D. committee Doeko Bosscher, *Grammars Modulo Bisimulation*, University of Amsterdam, October 1997.
35. Opposition at Ph.D. defense Frank van den Beuken, *A Functional Approach to Syntax and Typing*, University of Nijmegen, October 1997.
36. Opposition at Ph.D. defense Paul Frederiks, *Object-Oriented Modeling based on Information Grammars*, University of Nijmegen, June 1997.
37. External examiner Ph.D. thesis Anna Philippou, *Reasoning about Systems with Evolving Structure*, University of Warwick, UK, February 1997.
38. Referee Ph.D. thesis Ard Overkamp, *Discrete Event Control Motivated by Layered Network Architectures*, University of Groningen, November 1996.
39. Ph.D. committee Prof. M. Dezani-Ciancaglini, *Logical Semantics for Concurrent Lambda-Calculus*, University of Nijmegen, October 1996.
40. Opposition at Ph.D. defense Dennis Dams, *Abstract Interpretation and Partition Refinement for Model Checking*, Eindhoven University of Technology, July 1996.
41. Ph.D. committee Marco Kessler, *The Implementation of Functional Languages on Parallel Machines with Distributed Memory*, University of Nijmegen, April 1996.
42. Referee Ph.D. thesis Joost-Pieter Katoen, *Quantitative and Qualitative Extensions of Event Structures*, University of Twente, April 1996.
43. Opposition at Ph.D. defense Max Geerling, *Transformational Development of Data-Parallel Algorithms*, University of Nijmegen, February 1996.
44. Opposition at Ph.D. defense Peter Achten, *Interactive Functional Programs: Models, Methods, and Implementation*, University of Nijmegen, February 1996.

45. Referee Ph.D. thesis Mieke Massink, *Functional Techniques in Concurrency*, University of Nijmegen, February 1996.
46. Referee Ph.D. thesis Willem Jan Fokkink, *Clocks, Trees and Stars in Process Theory*, University of Amsterdam, December 1994.
47. Referee Ph.D. thesis Henri Korver, *Protocol Verification in  $\mu$ CRL*, University of Amsterdam, June 1994.
48. Opponent at the Ph.D. defense of Fredrik Orava, *On the Formal Analysis of Modern Telecommunication Protocols*, University of Uppsala, Sweden, June 1994.
49. Referee Ph.D. thesis Gioia Ristori, *Modeling Systems with Shared Resources via Petri Nets*, Università di Pisa, Italy, January 1994.
50. Referee Ph.D. thesis Steven Klusener, *Models and Axiom Systems for a Fragment of Real Time Process Algebra*, Eindhoven University of Technology, December 1993.
51. Referee Ph.D. thesis Amar Bouali, *Etudes et Mises en Oeuvre d'Outils de Vérification Basée sur la Bisimulation*, Université de Paris VII, France, March 1993.
52. Referee Ph.D. thesis Sophie Pinchinat, *Des Bisimulations pour les Systèmes Réactifs*, Université de Grenoble, France, January 1993.
53. Referee Ph.D. thesis Rom Langerak, *Transformations and Semantics for LOTOS*, University of Twente, November 1992.
54. External examiner Ph.D. thesis Karen Seidel, *Probabilistic Communicating Processes*. University of Oxford, UK, September 1992.
55. Opponent at the Ph.D. defense of Alban Ponse, *Process Algebra with Data*. University of Amsterdam, June 1992.
56. Member jury of Ph.D. thesis Guillaume Doumenc, *Traduction entre Calculs de Processus*. Université de Nice, France, December 1991.
57. Referee of Ph.D. thesis Han Zuidweg, *Concurrent System Verification with Process Algebra*. University of Leiden, November 1990.

58. Opponent at the Ph.D. defense of Rob van Glabbeek, *Comparative Concurrency Semantics and Refinement of Actions*. Free University, Amsterdam, May 1990.

## Invited Lectures at International Meetings

(Talks presented at project meetings and presentation of papers at conferences not included.)

1. *Learning I/O Automata*, Invited presentation at Dutch Model Checking Day 2010, University of Eindhoven, July 2010.
2. *Model Checking in Education: 10<sup>6</sup> Users and Beyond*, Ten Years After: An International Workshop on Advances in Model Checking, University of Twente, November 2006.
3. *Analysis of the Zeroconf Protocol Using UPPAAL*, IPA Herfstdagen, Bergen, 29 November 2006.
4. *Analysis of the Zeroconf Protocol Using UPPAAL*, ARTIST2 Meeting Verification and Validation, Eindhoven, 20-21 April 2006
5. *Timed Automata Tools Grow Up: Seven Case Studies from Nijmegen*, Seminar on Theoretical Computer Science, Computing Laboratory, University of Kent at Canterbury, United Kingdom, February 2005.
6. *Model Checker Aided Design of a Controller for a Wafer Scanner*, Belgian seminar on Computer Aided Verification, Centre Fédéré en Vérification, Brussels, November 2004.
7. *Switched Probabilistic I/O Automata*, Third International Symposium on Formal Methods for Components and Objects (FMCO 2004). Leiden, The Netherlands, November 2004.
8. *AMETIST — Advanced Methods for Timed Systems*, Workshop on Formal Methods in Industrial Applications and Engineering Curricula, Ghent, Belgium, 27 November 2003.
9. *Hybrid I/O Automata*, DISC Summer School on Modeling and Control of Hybrid Systems, Veldhoven, The Netherlands, June 23-26, 2003.

10. *Verification of timed and hybrid systems*, 23rd Marktobendorf summer school on “Models, Algebras, and Logic of Engineering Software”, July 30 - August 11, 2002.
11. *A Theory of (Normed) Simulation Relations*, Joint PAPM-PROBMIV 2001 Workshop, RWTH, Aachen, Germany, September 12-14, 2001.
12. *Verification of timed and hybrid systems*, International Summer School on Computational Logic (ISCL 2000), Maratea, Italy, September 3-8, 2000. (tutorial of 7 hours)
13. *Testing probabilistic automata*, Dagstuhl Seminar 2000181, Probabilistic Methods in Verification, Wadern, Germany, April 30 - May 5, 2000.
14. *Verification of hybrid systems*, Fifth International AMAST Workshop on Real-Time and Probabilistic Systems (ARTS'99), Bamberg, Germany, May 26–28, 1999.
15. *Hybrid I/O automata*, 5th International School on Formal Techniques in Real-Time and Fault-Tolerant Systems (FTRTFT'98), Lyngby, Denmark, September 14–15, 1998.
16. *Testing and verification of timed systems*, Seventh International Conference on Theory and Practice of Software Development (TAPSOFT'97), Lille, France, April 14–18, 1997.
17. *Hybrid I/O automata*, DIMACS Workshop on Verification and Control of Hybrid Systems, New Brunswick, New Jersey, USA, October 22–25, 1995.
18. *Verification of a distributed summation algorithm*, Sixth International Conference on Concurrency Theory (CONCUR'95), Philadelphia, Pennsylvania, USA, August 21–24, 1995.
19. *Linear hybrid systems*, Second European Workshop on Real-Time and Hybrid Systems, Grenoble, France, May 31 – June 2, 1995.
20. *Timed process algebra=untimed process algebra+timer operators*, Workshop on Algebra of Communicating Processes (ACP'94), Utrecht, May 16, 1994.

21. *Verification of an audio protocol*, First AMAST International Workshop on Real-Time Systems, Iowa City, Iowa, USA, November 3, 1993.
22. *General theory of structural operational semantics*, Fifth Nordic Workshop on Program Correctness, Turku, Finland, October 1993.
23. *Expressiveness results for process algebras*, Symposium on Logical Foundations of Computer Science (Logic at Tver), Sokol, Tver region, Russia, July 1992.
24. *Forward and backward simulations for timing-based systems*, CEDISYS Workshop, Sophia Antipolis, France, September 1991.
25. *On the relationship between process algebra and input/output automata*, Third Workshop on Concurrency and Compositionality, Goslar, Germany, March 1991.
26. *Process algebra: an axiomatic, algebraic approach*, First International Conference on Concurrency Theory (CONCUR'90), Amsterdam, August 1990.
27. *SOS and partial ordering semantics*, Second Workshop on Concurrency and Compositionality, San Miniato, Italy, February 1990.
28. *ACP: an algebraic approach to concurrency*, Ninth IFIP WG 6.1 International Symposium on Protocol Specification, Testing, and Verification (PSTV'89), Enschede, June 1989.
29. *An algebraic system verification in partial order semantics*, First Workshop on Combining Compositionality and Concurrency, Königswinter, Germany, March 1988.