

CURRICULUM VITAE

March 2016

Willem Conradie Visser

Professor
Computer Science
Stellenbosch University, South Africa
visserw@sun.ac.za
+27-21-808-4232

Google Citation indices

	All	Since 2011
Citations	6325	2622
h-index	38	24
i10-index	66	44

I'm a full Professor of Computer Science at Stellenbosch University (Head of the Department from 2009-2013). The South African National Research Foundation (NRF) rates me as an International Leader in my field (A rating and in 2013-2014 I was the convener of the NRF rating panel for IT (a member of the panel from 2011-2014)). Before joining Stellenbosch in 2009 I spent 8.5 years working for the Research Institute for Advanced Computer Science at NASA Ames Research Center where I was the Area Lead for the Reliable Software Engineering group (7 PhDs and 1 developer). I also spent 2 years as a senior engineer at SEVEN Networks, a startup in Silicon Valley doing email for mobile phones (2007-2009).

I was one of the pioneers of program model checking - applying model checking to detect defects in programs written in modern programming languages. I am best known for being the lead on the Java PathFinder model checker (JPF) project that has been open source since April 2005. Since 2009 there has been a yearly JPF workshop where researchers can present their JPF-related work. I developed the first version based on a custom-made JVM and showed that the approach was feasible, subsequently I supervised summer interns to add heuristic search, symbolic execution and abstraction into the tool. All three these additions were revolutionary at their time, but specifically the symbolic execution has led to a whole community working on using symbolic execution during model checking. Since 2011 I have been working on the probabilistic analysis of programs, a novel combination of symbolic analysis and model counting to allow precise reasoning about the reliability of software.

I have published more than 15 journal papers and upwards of 60 conference papers. I've been the co-program chair for the International Conference on Software Engineering (ASE) in 2008 and will be the co-program chair for the International Conference on Software Engineering (ICSE) in 2016 (this is the biggest academic conference in Software

Engineering). In 2014 the paper entitled "Model Checking Programs", for which I was the lead author, won the ASE Most Influential Paper award for its impact since publication in 2000. I have also been the invited speaker for SPIN 2009, AST 2010 and ICTAC 2011.

From 2012 until 2019 I am also an elected member-at-large of the ACM SIGSOFT Executive Committee. In addition I'm one of a 6-member team that is updating the Software Engineering curriculum guidelines to be released in 2014 (first version was done in 2004).

HIGHER EDUCATION

Universities attended University of Stellenbosch
 Stellenbosch, 7600, South Africa
 (1987-1993)

 University of Manchester
 Manchester, M13 9PL, UK
 (1995-1998)

Degrees obtained B.Sc (cum laude) (Stellenbosch)
 Hons B.Sc (cum laude) (Stellenbosch)
 M.Sc (cum laude) (Stellenbosch)

 Ph.D. Computer Science (Manchester)
 Supervisor: Prof H. Barringer
 Title: Efficient CTL* Model Checking Using
 Games and Automata Techniques

WORK EXPERIENCE

Employer Stellenbosch University
 Stellenbosch, South Africa
 6/1/09 - present

Job Title: Professor

Job Description Head of Division (2009-2013), teaching and
 researcher

Employer SEVEN Networks
 901 Marshall Street, Redwood City, CA 94063
 2/1/07 - 4/1/09

Job Title: Senior Software Engineer

Job Description Research and Development Lead for Testing, as
 well, as Data mining and analysis engineering
 lead

Skills Data Mining Tools and Techniques, including
 SQL, PL/SQL, Excel. Oracle DB Administration
 Project and Product Management and Outsourcing

Employer Research Institute for Advanced Computer
 Science RIACS)
 Moffett Field, Mountain View, CA 94035, USA
 10/19/98 - 1/31/07

Job Title: Reliable Software Engineering Research Lead

Job Description: Conduct research within the Robust Software
 Engineering Group at NASA Ames:

- Advanced Testing Task Lead

- Develop testing tools to find software errors
- Reduce cost of software development at NASA

Skills Java Object Oriented Programming
Model Checking, Testing, Static Analysis and
Abstraction Research
Proposal Writing

Employer DataFusion Systems
Stellenbosch, South Africa
4/1/94 - 1/1/95

Job Title Programmer
Job Description Design and Implementation of a Prototype
Automated
Directory Enquiry System for Telkom (South
African Telephone Company)

Skills C++ Object Oriented Programming
Windows NT Concurrent Programming Networking:
TCP/IP, NT Pipes and in-house protocols
Testing and Software Support

TEACHING EXPERIENCE

Employer University of Stellenbosch
6/1/09 - present

Description Professor

Courses CS745 - Advanced Testing
CS334 - Database and Web-programming

Employer University of Manchester
1/25/95 - 6/26/98

Description Teaching Assistant in Laboratory Work

Courses Computational Complexity and Automata Theory
(2nd Year) Propositional Logic (1st Year)
SML Programming (1st, 2nd Year) C Programming (1st,
2nd Year) Formal Program Development (2nd Year)
Compiler Construction (2nd Year)

Employer University of Stellenbosch
7/1/98 - 10/1/98

Description Lecturer

Courses Automata Theory and Model Checking

PUBLICATIONS

Books

1. SPIN Model Checking and Software Verification.
Klaus Havelund, John Penix, and Willem Visser. Editors.
Lecture Notes in Computer Science, Volume 1885.
Springer-Verlag. ISBN 3-540-41030-9
2. Special Issue of Software Testing, Verification and Reliability.
Journal on selected papers from WAPATV 2001. Volume 11, Number 2.
June 2001. Guest Editors: Nigel Tracey, John Penix and Willem
Visser. Wiley. Online ISSN: 1099-1689. Print ISSN: 0960-0833

Journals

1. Willem Visser and Howard Barringer.
Practical CTL* Model Checking - Should SPIN be extended?
International Journal for Software Tools for Technology Transfer.
Volume 2 Number 4, April 2000
2. Willem Visser, Klaus Havelund, Guillaume Brat, SeungJoon Park and
Flavio Lerda.
Model Checking Programs.
Automated Software Engineering Journal.
Volume 10, Number 2, April 2003.
3. Klaus Havelund and Willem Visser.
Program Model Checking as a New Trend
International Journal on Software Tools for Technology Transfer
(STTT)
Volume 4, Number 1. October 2002.
4. John Penix, Willem Visser, SeungJoon Park, Phil Oh, Corina
Pasareanu, Cindy Kong, Eric Engstrom, Aaron Larson and Nicholas
Weininger.
Verifying Time Partitioning in the DEOS Scheduling Kernel
Invited paper for Formal Methods in System Design journal.
Volume 26, Issue 2, March 2005
5. Corina Pasareanu, Matt Dwyer and Willem Visser.
Finding Feasible Abstract Counter-examples.
Software Tools and Technology Transfer Journal.
Volume 5, Number 1, November 2003
6. G. Brat, D. Drusinsky, D. Giannakopoulou, A. Goldberg, K.
Havelund, M. Lowry, C. Pasareanu, A. Venet, R. Washington and W.
Visser
Experimental Evaluation of Verification and Validation Tools on
Martian Rover Software
Invited paper for Formal Methods in System Design Journal.
Volume 25, September 2004
7. Alex Groce and Willem Visser
Heuristic Model Checking for Java Programs
Invited to International Journal on Software Tools for Technology

- Transfer (STTT)
Volume 6, Number 4, December 2004.
8. R. Bordini, M. Fisher, W. Visser, and M. Wooldridge
Model Checking Rational Agents
IEEE Intelligent Systems 19(5):46-52.
September/October, 2004
 9. C. Artho, H. Barringer, A. Goldberg, K. Havelund, S. Khurshid, M. Lowry, C. Pasareanu, G. Rosu, K. Sen, W. Visser, R. Washington.
Combining Test Case Generation and Runtime Verification.
Theoretical Computer Science 336(2-3): 209-234 (2005)
 10. R. Bordini, M. Fisher, W. Visser, and M. Wooldridge,
Verifying multi-agent programs by model checking.
Journal of Autonomous Agents and Multi-Agent Systems 12(2):239-256. March 2006
 11. Corina Pasareanu, Radek Pelanek and Willem Visser
Predicate Abstraction with Under-approximation Refinement
Logical Methods in computer Science
Volume 3, Issue 1, 2007
 12. Saswat Anand, Corina Pasareanu, Willem Visser
Symbolic Execution with Abstraction
International Journal on Software Tools for Technology Transfer (STTT)
Volume 11, Number 1, 2009
 13. R. Bordini, M. Fisher, M. Wooldridge and W. Visser
Property-based Slicing for Agent-Oriented Programming Language
Journal of Logic and Computation
Volume 19, Number 6, pages 1385-1425, 2009
 14. Corina Pasareanu and Willem Visser
A survey of new trends in symbolic execution for software testing and analysis
International Journal on Software Tools for Technology Transfer (STTT)
Volume 11, Number 4, October 2009
 15. Willem Visser, Matthew B. Dwyer and Michael Whalen
The Hidden Models of Model Checking.
Software and systems Modeling
Volume 11 Number 4, Pages 541-555, 2012
 16. Corina Pasareanu, Willem Visser, David Bushnell, Jaco Geldenhuys, Peter Mehlitz and Neha Rungta
Symbolic PathFinder: Integrating Symbolic Execution with Model Checking for Java Bytecode Analysis.
Automated Software Engineering
Volume 20, Number 3, Pages 391-425. 2013
 17. Nicolás Rosner, Jaco Geldenhuys, Nazareno Aguirre, Willem Visser, Marcelo F. Frias: BLISS: Improved Symbolic Execution by Bounded Lazy Initialization with SAT Support. IEEE Transactions on Software Engineering 41(7): 639-660 (2015)

Conference Proceedings

Ph.D. work and before

1. P de Villiers and W Visser.
ESML - A Validation Language for Reactive Systems.

- Proceedings of the 7th Southern African Computer Symposium,
July 1992.
2. Willem Visser.
An Execution Environment for a Validation Language.
Proceedings of the 7th National Masters and PhD Computer Science.
Students Conference, July 1992.
 3. Willem Visser.
Validation of Reactive Programs which Incorporate Structured
Data. Proceedings of the 11th British Colloquium for Theoretical
Computer Science. Swansea, April 1995.
 4. Willem Visser.
Using OBDD encodings for Space Efficient State Storage during On-
the-fly Model Checking.
Proceedings of the 12th British Colloquium for Theoretical
Computer Science. Canterbury, April 1996.
 5. W.C. Visser and H. Barringer.
Memory Efficient State Storage in SPIN.
Proceedings of the Second Workshop in the SPIN Verification
System.
American Mathematical Society, DIMACS/39.
Rutgers, August 1996.
 6. Willem Visser, Howard Barringer, Donal Fellows, Graham Gough and
Alan Williams.
An Example of Efficient CTL^{*} Model Checking for Analysis of
Rainbow Designs. Proceedings of 2nd UK Asynchronous Forum.
Newcastle, July 1997.
 7. Willem Visser, Howard Barringer, Donal Fellows, Graham Gough and
Alan Williams.
Efficient CTL^{*} Model Checking for Analysis of Rainbow Designs.
Proceedings of IFIP WG 10.5 Advanced Research Working Conference
on Correct Hardware Design and Verification Methods (CHARME'97).
Montreal, October 1997.
 8. Willem Visser and Howard Barringer.
CTL^{*} Model Checking for SPIN.
Proceedings of the 4th SPIN Workshop.
Paris, France. November 1998.

After Ph.D. (all refereed)

1. Willem Visser, Klaus Havelund and John Penix.
Adding Active Objects to SPIN.
Proceedings of the 5th SPIN workshop.
Trento, Italy. July 1999
2. Willem Visser, J. Penix, E. Engstrom, A. Larson and N.
Weininger.
Verification of Time Partitioning in the DEOS real-time
Scheduling Kernel.
Proceedings of the 22nd International Conference on Software
Engineering (ICSE).
Limerick, Ireland. June 2000.
3. Willem Visser, Klaus Havelund, Mike Lowry, SeungJoon Park,
Charles Pecheur, John Penix, Jon L. White.
Formal Analysis of the Remote Agent Before and After Flight.
5th NASA Langley Formal Methods Workshop.
June 2000.

4. W. Visser, K. Havelund, G. Brat, S. Park. Model Checking Programs.
Proceedings of the 15th International Conference on Automated Software Engineering (ASE),
Grenoble, France, September 2000.
(Most Influential Paper award 2014)
5. G. Brat, K. Havelund, S. Park, W. Visser.
Java PathFinder - A second generation of a Java model checker.
Proceedings of the Workshop on Advances in Verification,
Chicago, Illinois, July 2000.
6. W. Visser, S. Park and J. Penix.
Applying Predicate Abstraction to Model Check Object-Oriented Programs.
Proceedings of the 3rd ACM SIGSOFT Workshop on Formal Methods in Software Practice.
Portland, Oregon, August 2000.
7. M. Dwyer, J. Hatcliff, R. Joehanes, S. Laubach, C. Pasareanu, Robby, W. Visser, H. Zheng
Tool-supported Program Abstraction for Finite-state Verification.
Proceedings of ICSE2001.
May 2001.
8. C. Pasareanu, M. Dwyer, W. Visser
Finding Feasible Counter-examples when Model Checking Abstracted Java Programs
Proceedings of TACAS2001.
April 2001.
9. F. Lerda and W. Visser.
Addressing Dynamic Issues of Program Model Checking.
Proceedings of the 8th International SPIN Workshop.
Lecture Notes in Computer Science volume 2057.
Toronto, May 2001.
10. M. Heimdahl, S. Rayadurgam, W. Visser.
Specification Centered Testing.
Proceedings of the Second International Workshop on Automated Program Analysis, Testing and Verification.
Toronto, May 2001.
11. J. Penix and W. Visser.
Coverage Metrics for Model Checking.
Proceedings of the Second International Workshop on Automated Program Analysis, Testing and Verification.
Toronto, May 2001.
12. C. Pecheur, W. Visser, R. Simmons.
RIACS Workshop on the Verification and Validation of Autonomous and Adaptive Systems.
Workshop summary published by AI Magazine.
Volume 22, Number 3, Fall 2001.
13. G. Brat and W. Visser
Combining Static Analysis and Model Checking for Software Analysis.
Proceedings of ASE2001.
San Diego, November 2001
14. A. Groce and W. Visser
Heuristic Model Checking for Java Programs
Proceedings of the 9th International SPIN Workshop on Software

- Model Checking. LNCS 2318.
Grenoble, France, April 2002
15. A. Groce and W. Visser
Model Checking Java Programs using Structural Heuristics
Proceedings of the International Symposium on Software Testing
and Analysis. Rome, Italy, July 2002
 16. M. Fisher and W. Visser
Verification of Autonomous Space-craft Control
Proceedings of Workshop on AI Planning and Scheduling for
Autonomy in Space Applications.
Manchester, UK, July 2002
 17. O. Tkachuk, G. Brat and W. Visser.
Using Code Level Model Checking to Discover Automation Surprises
Proceedings of Digital Avionics Systems Conference.
Irvine, CA. October 2002
 18. C. Artho, D. Drusinsky, A. Goldberg, K. Havelund, M. Lowry, C.
Pasareanu, G. Rosu and W. Visser
Experiments with Test Case Generation and Runtime Analysis
Proceedings of ASM 2003.
Taormina, Italy. March 2003
 19. G. Brat, D. Giannakopoulou, A. Goldberg, K. Havelund, M. Lowry,
C. Pasareanu, A. Venet and W. Visser.
Experimental Evaluation of Verification and Validation Tools on
Martian Rover Software.
Proceedings of the SEI Software Model Checking Workshop.
Pittsburgh, March 2003
 20. S. Khurshid, C. S. Pasareanu and W. Visser.
Generalized Symbolic Execution for Model Checking and Testing
Proceedings of TACAS 2003.
Warsaw, Poland, April 2003
 21. A. Groce and W. Visser.
What Went Wrong: Explaining Counterexamples
Proceedings of SPIN 2003.
Portland, Oregon. May 2003
 22. R. Bordini, W. Visser, M. Fisher, C. Pardavila, and M. Wooldridge
Model checking multi-agent programs with CASP.
Proceedings of CAV 2003.
Boulder, CO. July 2003
 23. W. Visser.
Model Checking Programs with Java PathFinder.
Invited Tutorial. Proceedings of CAV 2003.
Boulder, CO, July 2003
 24. R. Bordini, M. Fisher, M. Wooldridge and W. Visser
Programming and Verifying Multi-Agent systems using AgentSpeak.
Proceedings of the AAMAS'03 Workshop on Programming Multiagent
Systems.
Melbourne, Australia. July 2003.
 25. M. Heimdahl, S. Rayadurgam, W. Visser, G. Devaraj, J. Gao
Auto-Generating Test Sequences using Model Checkers: A Case Study
Proceedings of Formal Approaches to Testing of Software (FATES)
2003 Quebec, Canada, October 2003 LNCS 2931
 26. C. Pasareanu and W. Visser
Verification of Java Programs Using Symbolic Execution and
Invariant Generation.

- Proceedings of SPIN 2004.
Barcelona, Spain, April 2004 LNCS 2989
27. W. Visser, C. Pasareanu, S. Khurshid
Test Input Generation with Java PathFinder
Proceedings of ISSTA 2004,
Boston, MA, July 2004
 28. R. Bordini, M. Fisher, W. Visser, and M. Wooldridge,
State-space reduction techniques in agent verification.
In Proceedings of the Third International Joint Conference on
Autonomous Agents and Multi-Agent Systems (AAMAS-2004),
New York, NY, 19-23 July 2004.
 29. Matthew Dwyer, Robby, Oksana Tkachuk, Willem Visser
Analyzing Interaction Orderings with Model Checking.
In proceedings of the 19th Automated Software Engineering
Conference.
Linz, Austria, September 2004
 30. R. Bordini, M. Fisher, W. Visser, and M. Wooldridge
Model Checking Rational Agents
IEEE Intelligent Systems 19(5):46-52.
September/October, 2004
 31. Corina Pasareanu, Radek Pelanek and Willem Visser
Concrete Model Checking with Abstract Matching and Refinement
Proceedings of CAV 2005
LNCS 3576.
July 2005
 32. Willem Visser, Corina Pasareanu and Radek Pelanek
Test Input Generation for Red Black Trees using Abstraction.
Proceedings of ASE 2005
November 2005, Long Beach, CA
 33. Gary Lindstrom, Peter Mehlitz, and Willem Visser,
Model Checking Real Time Java Using Java PathFinder
Proc. Third International Symposium on Automated Technology for
Verification and Analysis (ATVA)
LNCS 3707
Oct. 4-7, 2005
 34. Gary Lindstrom, Peter Mehlitz and Willem Visser
A Simulation Based Model Checker for Real-time Java
The 3rd Workshop on Java Technologies for Real-time and Embedded
Systems (JTRES)
October 2005
 35. M. Fisher, E. Pearce, M. Wooldridge, M. Sierhuis, W. Visser, W.,
R. Bordini.
Towards the verification of human-robot teams.
In IEEE ISoLA Workshop on Leveraging Applications of Formal
Methods, Verification, and Validation,
23-24 September 2005,
Loyola College Graduate Center, Columbia, MD.
 36. Johann Schumann and Willem Visser
Autonomy Software: V&V Challenges and Characteristics
IEEE Aerospace,
Big Sky, Montana, March 2006
 37. Saswat Anand, Corina Pasareanu, Willem Visser.
Symbolic Execution with Abstract Subsumption Checking.
13th International SPIN Workshop on Model Checking of Software

- (SPIN),
Vienna, Austria, April 2006
38. Willem Visser, Corina Pasareanu and Radek Pelanek
Test Input Generation for Java Containers using State Matching
Proceedings of ISSTA 2006
Portland, Maine, July 2006
 39. Saswat Anand, Corina Pasareanu, Willem Visser.
JPF-SE: A Symbolic Execution Extension to Java Pathfinder.
13th International conference on Tools and Algorithms for the
Construction and Analysis of Systems (TACAS),
Braga, Portugal, April 2007.
 40. M. Dwyer, J. Hatcliff, Robby, C. Pasareanu and W. Visser
Formal Software Analysis Emerging Trends in Model Checking
ICSE 2007 Workshop on Future of Software Engineering
Minneapolis, USA, May 2007
 41. Aaron Tomb, Guillaume Brat and Willem Visser
Variably Interprocedural Program Analysis for Runtime Error
Detection
Proceedings of ISSTA 2007.
July 2007. London, UK.
 42. Corina Pasareanu and Willem Visser
Symbolic Execution and Model Checking for Testing.
Proceedings of the Third International Haifa Verification
Conference (HVC)
October 2007. Haifa, Israel
 43. Neha Rungta, Eric Mercer and Willem Visser. Efficient Testing of
Concurrent Programs with Abstraction-Guided Symbolic Execution.
SPIN 2009. Grenoble France
 44. Willem Visser
Who Really Cares if the Program Crashes
Abstract for Invited Presentation
SPIN Workshop 2009
 45. Willem Visser and Jaco Geldenhuys
Impendulo: Debugging the Programmer
ASE 2010, Antwerpen, Belgium, September 2010
 46. M. Whalen, P. Godefroid, Leonardo Mariani, Andrea Polini, N.
Tillmann, and W. Visser
FITE: Future Integrated Testing Environment
Workshop on the Future of Software Engineering Research, Santa
Fe, New Mexico, USA, November 2010
 47. Cristian Cadar, Patrice Godefroid, Sarfraz Khurshid, Corina
Pasareanu, Koushik Sen, Nikolia Tillmann and Willem Visser
Symbolic Execution for Software Testing in Practice - Preliminary
Assessment
ICSE Impact Track 2011, Hawai'i, USA, May 2011
 48. Corina Pasareanu, Neha Rungta and Willem Visser.
Symbolic Execution with Mixed Concrete-Symbolic Solving
ISSTA 2011, Toronto, Canada, July 2011
 49. Willem Visser, Jaco Geldenhuys, Matthew B. Dwyer: Green:
reducing, reusing and recycling constraints in program
analysis. SIGSOFT FSE 2012: 58
 50. Gideon Redelinghuys, Willem Visser, Jaco Geldenhuys: Symbolic
execution of programs with strings. SAICSIT Conf. 2012: 139-148

51. Marcel Dunaiski, Willem Visser: Comparing paper ranking algorithms. SAICSIT Conf. 2012: 21-30
52. G. C. Morrison, Cornelia P. Inggs, W. C. Visser: Automated coverage calculation and test case generation. SAICSIT Conf. 2012: 84-93
53. W. H. K. Bester, Cornelia P. Inggs, W. C. Visser: Test-case generation and bug-finding through symbolic execution. SAICSIT Conf. 2012: 1-9 **(BEST PAPER)**
54. Jaco Geldenhuys, Matthew B. Dwyer, Willem Visser: Probabilistic symbolic execution. ISSTA 2012: 166-176
55. Heila van der Merwe, Brink van der Merwe, Willem Visser: Verifying android applications using Java PathFinder. ACM SIGSOFT Software Engineering Notes 37(6): 1-5 (2012)
56. Gregory W. Hislop, Mark A. Ardis, David Budgen, Mark J. Sebern, Jeff Offutt, Willem Visser: Revision of the SE 2004 curriculum model. SIGCSE 2013: 383-384
57. Jaco Geldenhuys, Nazareno Aguirre, Marcelo F. Frias, Willem Visser: Bounded Lazy Initialization. NASA Formal Methods 2013: 229-243
58. Antonio Filieri, Corina S. Pasareanu, Willem Visser: Reliability analysis in symbolic pathfinder. ICSE 2013: 622-631
59. Mateus Borges, Antonio Filieri, Marcelo d'Amorim, Corina S. Pasareanu, Willem Visser: Compositional solution space quantification for probabilistic software analysis. PLDI 2014: 15
60. Willem Visser, Nikolaj Bjørner, Natarajan Shankar: Software engineering and automated deduction. FOSE 2014: 155-166
61. Heila van der Merwe, Brink van der Merwe, Willem Visser: Execution and property specifications for JPF-android. ACM SIGSOFT Software Engineering Notes 39(1): 1-5 (2014)
62. Antonio Filieri, Corina S. Pasareanu, Willem Visser, Jaco Geldenhuys: Statistical symbolic execution with informed sampling. SIGSOFT FSE 2014: 437-448
63. Antonio Filieri, Marcelo F. Frias, Corina S. Pasareanu, Willem Visser: Model Counting for Complex Data Structures. SPIN 2015: 222-241
64. Heila van der Merwe, Oksana Tkachuk, Brink van der Merwe, Willem Visser: Generation of Library Models for Verification of Android Applications. ACM SIGSOFT Software Engineering Notes 40(1): 1-5 (2015)
65. Heila van der Merwe, Oksana Tkachuk, Sean Nel, Brink van der Merwe, Willem Visser: Environment Modeling Using Runtime Values for JPF-Android. ACM SIGSOFT Software Engineering Notes 40(6): 1-5 (2015)
66. Mark A. Ardis, David Budgen, Gregory W. Hislop, Jeff Offutt, Mark J. Sebern, Willem Visser: SE 2014: Curriculum Guidelines for Undergraduate Degree Programs in Software Engineering. IEEE Computer 48(11): 106-109 (2015)

Popular Articles

1. NASA Tech Brief August 2007
A Method of Partly Automated Testing of Software.
2. NASA Tech Brief September 2007
Model Checker for Java Programs

PRESENTATIONS (post Ph.D.)

1. "CTL* Model Checking for SPIN".
Presentation at SPIN98. Paris. 2 November 1998.
2. "Software Model Checking at NASA Ames".
Invited talk at Kansas State University. 5 April 1999.
3. "DEOS Verification".
Invited talk at Honeywell HTC. Minneapolis. 7 April 1999.
4. "Adding Active Objects to SPIN".
Presentation at SPIN99. Trento, Italy. 12 July 1999.
5. "Analytic Verification at NASA Ames".
Presentation and Demonstration. LUACTS Workshop. Johannesburg, South Africa. 6 December 1999.
6. "Picking Low-hanging Fruit".
RIACS Seminar Series. NASA Ames, California, 13 April 2000.
7. "Software Model Checking".
Invited presentation at Manchester University, England, 30 May 2000.
8. "Java PathFinder".
Presentation at Workshop on Advances in Verification. Chicago. 20 July 2000.
9. "Model Checking Programs".
Presentation at Conference on Automated Software Engineering. Grenoble. France. 13 September 2000.
10. "Model Checking Programs at NASA".
Presentation at Carnegie Mellon University. Pittsburgh. USA. 11 December 2000.
11. "Java Model Checking".
Invited Presentation at National Security Agency. Baltimore, March 2001.
12. "Java Model Checking at NASA Ames".
Presentation at University of Minnesota. June 2001.
13. "Java Model Checking".
Invited Presentation at Java Verification Workshop. Portland. January 2002.
14. "Model Checking the Fault-Protection Unit with JPF".
Joint presentation with Eddie Benowitz (JPL) at NASA Ames. September 2002.
15. "Software Model Checking".
Invited Tutorial at ASE 2002 Conference. Edinburgh, Scotland. September 2002.
16. "Model Checking Programs with Java PathFinder".
Invited Presentation at University of Liverpool. England. September 2002.
17. "Verification and Validation".
Presentation to Dennis Andrucyk (Director of Mission and Science Measurement Technology Theme at NASA). NASA Ames, CA. January 2003.

18. "Experimental Evaluation of Verification and Validation Tools on Martian Rover Software".
Presentation at SEI Software Model Checking Workshop. Pittsburgh. March 2003.
19. "Model Checking Primer".
Presentation to Mars Science Laboratory V&V team. NASA Ames, CA. April 2003.
20. "Software Model Checking".
Invited Tutorial at Fujitsu Labs America. Sunnyvale, Ca. May 2003.
21. "Java Pathfinder, Explaining Errors and Symbolic Execution".
Invited Presentation at SRI. Menlo Park, CA. May 2003.
22. "Model Checking Programs with Java PathFinder"
Invited Tutorial CAV 2003. Boulder, CO, July 2003.
23. "Software Model Checking and Java PathFinder Tutorial"
Invited Tutorial University of Stellenbosch, South Africa, October 2003.
24. "Understanding Java PathFinder 3.1"
Dagstuhl Seminar on the Understanding of Program Dynamics. December 2004. Dagstuhl, Germany.
25. "Symbolic Execution and Test Input Generation"
Invited Presentation at University of Utah. February 2004.
26. "Symbolic Execution and Test Input Generation"
Invited Presentation at Brigham Young University. February 2004.
27. "Symbolic Execution and Test Input Generation"
Invited Presentation at UC Santa Cruz. February 2004.
28. "Symbolic Execution and Test Input Generation"
Invited Presentation at Georgia Tech. April 2004.
29. "Test Input Generation with Java PathFinder"
ISSTA 2004 Conference, Boston, July 2004
30. "Analyzing the Daisy File-system with JPF"
Invited Presentation at the ISSTA/CAV co-located event, Boston, July 2004.
31. "Model Checking and Symbolic Execution for Test Input Generation".
Invited Presentation at Microsoft Workshop on Trends in Testing, August 2005.
32. "Program Model Checking"
Invited Presentation for the Software Model Checking Panel at the Verification Grand Challenge Workshop, SRI, February 2005.
33. "Going from Concrete to Symbolic Model Checking via Predicate Abstraction"
Invited Presentation Carnegie Mellon University, March 2005.
34. "Going from Concrete to Symbolic Model Checking via Predicate Abstraction"
Invited Presentation Fujitsu Labs of America, March 2005.
35. "Verifying Aerospace Software"
Invited Presentation at Agents in Space Symposium Liverpool (UK), July 2005
36. "Test Input Generation for Java Containers using State Matching"
ISSTA 2006, Portland, Maine, July 2006
37. "Future of Software Analysis"
Invited Presentation, National Institute of Informatics, Tokyo, Japan, September 2006
38. "How Many Roads Must a Test Walk Down"
Invited Presentation, Google, Mountain View, October 2006

39. "Java PathFinder and Symbolic Analysis"
Invited Presentation, University of York, Toronto, Canada
November 2006
40. "The Pros and Cons of Model Checking: Java PathFinder and Beyond"
Invited Presentation, University of California at Berkeley.
February 2007.
41. "Variably Interprocedural Program Analysis for Runtime Error
Detection"
ISSTA 2007, London, UK
42. "How Many Roads Must a Test Walk Down"
Invited Presentation, University of Twente, Netherlands
April 2008
43. "Testing Theory Meets the Real World"
Invited Presentation, University of Nebraska - Lincoln
October 2008
44. "Testing Theory Meets the Real World"
Invited Presentation, Oregon State University
December 2008
45. "Who Really Cares if the Program Crashes?"
Invited Speaker, SPIN 2009, Grenoble France.
46. "42"
Invited Presentation. Latest Advanced in Software Testing and
Analysis, Milan Italy, April 2009
47. "Finding Important Bugs is not Easy" - Keynote presentation at
Automated Software Testing, Cape Town, 2010
48. "From Computer Science to Software Engineering"
Professorial Inauguration Speech, Stellenbosch University, August
2010
49. "FITE: Future Integrated Test Environment" - Future of Software
Engineering Workshop in Santa Fe, New Mexico, November 2010
50. "Towards Checking the Usefulness of Verification Tools" - Usable
Verification Workshop at Microsoft Research, Redmond, USA,
November 2010
51. "Automatic Test Generation - SymCrete" - Fujitsu Labs of America,
Sunnyvale, CA. July 2011.

... This list is now incomplete!

OTHER PROFESSIONAL ACTIVITIES

Workshop Organizer

1. The First International Workshop on Automated Program Analysis,
Testing and Verification.
4-5 June 2000, Limerick, Ireland.
2. The 7th International SPIN Workshop on Model Checking of
Software.
30,31 August and 1 September 2000. Palo Alto, USA.
3. RIACS Workshop on the Verification and Validation of Autonomous
and Adaptive Systems.
5-7 December. Asilomar, USA.

4. The Second International Workshop on Automated Program Analysis, Testing and Verification.
13 May 2001, Toronto, Canada.
5. Workshop on Software Model Checking.
23 July 2001. Paris, France.
6. 2nd Workshop on Software Model Checking.
14 July 2003. Boulder, Colorado.
7. 3rd Workshop on Software Model Checking.
July 2005. Edinburgh, Scotland.
8. Directed Model Checking, Dagstuhl Seminar,
April 2006, Germany.
9. SPIN Workshops
September 2011, Lawrence, Kansas
November 2012, Raleigh, North Carolina
November 2013, Palo Alto, California

Other Organizational Activities

- Tutorial chair for ASE 2005
- Doctorial Symposium chair for ASE 2007
- Program chair for ASE 2008
- Program chair for ICSE 2010 Software Engineering in Practice Track

Program committee member

- International Symposium on Software Testing and Analysis 2009, 2010, 2011, 2012, 2013
- International Symposium on Formal Methods 2009, 2012, 2014
- International Conference on Software Engineering 2009 New Ideas and Emerging Trends
- Program Chair for ACM/IEEE International Conference on Automated Software Engineering 2008
- International Conference on Software Engineering 2007, 2011, 2012, 2013, 2014, 2015, 2016 (co-chair)
- International Conference on Software Engineering - Experience Reports 2005, chair 2010
- ACM SIGSOFT Symposium on Foundations of Software Engineering (FSE) 2004, 2012, 2013 (ESEC/FSE), 2014
- Fundamental Aspects of Software Engineering 2011
- International Conference on Software Testing 2011, 2012, 2013
- International Workshop on Parallel and Distributed Model Checking (PDMC) 2003, 2004 and 2008
- SPIN 2000, 2001, 2002, 2005, 2006, 2007, 2010, 2014
- ACM/IEEE International Conference on Automated Software Engineering 2001, 2002, 2003, 2005, 2006, 2007, 2009, 2010 and chair 2008, 2009, 2010, 2011, 2013, 2014 (ERP)
- Infinity Workshop 2004 and 2005
- Formal Methods for Industrial Critical Systems 2002 and 2007
- Model Checking and Artificial Intelligence 2002

- Tools and Algorithms for Construction and Analysis of Systems 2003, 2014, 2015
- IBM Verification Conference 2005, 2006, 2007 and 2008
- PROMISE Workshop 2006, 2007, 2008
- PADTAD Workshop 2006, 2007 and 2008
- Model-Based Testing and Object-Oriented Systems 2007
- Parallel and Distributed Systems: Testing and Debugging 2006
- International Workshop on Software Quality Assurance (SOQUA) 2006 and 2007
- Brazilian Symposium on Formal Methods 2007 and 2008
- 4th Asia-Pacific Software Engineering Conference (APSEC) 2007 and 2008
- Runtime Verification Conference 2010 and 2011
- Plugins Workshop 2011
- NASA Formal methods Symposium 2011, 2012, 2013, 2015
- Runtime Verification 2010, 2011, 2012
- Working Conference on Verified Software: Theories, Tools and Experiments 2010, 2012, 2013

Recent reviews for the following journals and conferences

- Associate Editor for Transactions on Software Engineering and Methodology 2011 - present
- ACM Transactions on Software Engineering and Methodology
- Communications of the ACM
- IEEE Transactions on Software Engineering
- Kluwer Journal on Automated Software Engineering
- International Journal on Formal Methods in System Design
- International Journal on Software Tools for Technology Transfer
- International Conference on Automated Software Engineering
- International Conference on Computer Aided Verification

Invited Keynote Speaker

- International SPIN Workshop on the Model Checking of Software 2009
- 5th International Workshop on Automation of Software Test 2010
- Invited Keynote for International Colloquium on Theoretical Aspects of Computing 2011 (ICTAC)

Invited Expert Panelist at the following international meetings

- "The Future of SPIN"
Panel at the 5th SPIN Workshop in Trento, Italy 1999.
- "Will Model Checking Scale to Software?"
Panel at the 14th International Conference on Automated Software Engineering at Cocoa Beach, Florida, October 1999.
- "Software Model Checking Panel"
Panel at the Grand Challenge in Verification Workshop held at SRI, Menlo Park, February 2005.

- "ASE Retrospective Panel"
Panel at ASE 2006, Tokyo, Japan, September 2006
- "State of Software Engineering in South Africa"
ICSE 2010, Cape Town, South Africa

Tutorials given at international meetings

- Software Model Checking Tools and Trends at NASA"
Tutorial presented at the 5th NASA Langley Formal Methods Workshop, Williamsburg, USA. June 2000.
- "Model Checking for Software"
Tutorial at the 15th International Conference on Automated Software Engineering Conference, Grenoble, France, September 2000.
- "Bandera and JPF"
Tutorial at ETAPS. Grenoble, France. April 2002.
- "Software Model Checking"
Tutorial at the 17th International Conference on Automated Software Engineering. Edinburgh, Scotland. September 2002.
- "Model Checking Programs with Java PathFinder"
Invited tutorial at International Conference on Computer Aided Verification. Boulder, Colorado, July 2003.
- "Software Model Checking and Java PathFinder"
Invited Tutorial University of Stellenbosch, South Africa, October 2003.
- "Java PathFinder"
Invited Tutorial SPIN, San Francisco, November 2005
- "Directed Software Model Checking"
Dagstuhl, April 2006
- "Java PathFinder"
Invited Tutorial ASE 2006, Tokyo, September 2006
- "Java PathFinder - Core System"
Invited Tutorial, ISSTA 2010, Trento, Italy, July 2010

Ph.D. Thesis Committee Member/Thesis Reviewer

- Alex Groce - Carnegie Mellon University, Graduated 2005
- Jitka Zidkova - Masaryk University (Czech Republic), Graduated 2004
- Oksana Tkachuk - Kansas State University, Graduated 2008
- Radek Pelanek - Masaryk University, Graduated 2007
- Flavio Lerda - Carnegie Mellon University, will graduate 2008
- Saswat Anand - Georgia Tech, will graduate 2009
- K. Qian, University of New South Wales, Graduated 2006
- Graham Hughes, University of Santa Barbara, will graduate 2009

Past Students

- Willem Bester (M.Sc. 2013)
- Gideon Redelinghuys (M.Sc. 2011)
- Piet Theron (M.Sc. 2013)

- Pieter Kruger (M.Sc. 2011)
- Kevin Durant (M.Sc. 2012)
- Aline Uwimbabazi (M.Sc. 2013)
- Marcel Dunaiski (M.Sc. 2014)
- Pieter Jordaan (M.Sc. 2014)

Current Students

- Ulvi Guliyev (Phd)
- Marcel Dunaiski (Phd)
- Heila vd Merwe (Phd)

FUNDING

- Telkom Centre of Excellence (2009)
 - Cloud Computing
 - R100,000 (plus R33,000 from THRIP)
 - Infinite Loop and Performance Analysis
 - R100,00 (plus R33,000 from THRIP)
- NRF Conference Funding (2010)
 - For hosting /ICSE (R40,000)
- FINLO Funding for IMPENDULO (2011)
 - Joint with Jaco Geldenhuys and Brink vd Merwe (R34,000)
- NRF Rated Researchers Competitive Program (2014)
 - R450,000 over 3 years
- NRF Bilateral with Argentina (2012-2014)
 - R290,000 over 3 years

COMMUNITY INTERACTION

- Steering committee member for the International Conference on Software Engineering, since 2013
- Steering committee member of the International Conference on Automated Software Engineering, since 2008
- Steering committee member of the SPIN Workshop on Software Model Checking, since 2010
- SIGSOFT Executive Committee Member-at-Large July 2012 – July 2015
- Selected as Higher Education South Africa's representative to the eSkills Working Group (that advises the eSkills Council of South Africa)
- Board member of the Cape IT Initiative (CITI)

- Board member for IMPI Holdings
 - Startup doing anti-virus software for mobile devices

AWARDS

Awarded an A rating by the National Research Foundation (NRF) of South Africa in 2016. Only the 2nd person in the history to receive an A rating for Computer Science.

The Java PathFinder Model Checking Team received the Engineering Innovation award under the Turning Goals into Reality initiative of NASA's Office of Aerospace Technology, June 2003.

Certificate of Recognition from NASA's inventions and contributions board for the creative development of technically significant software of Java PathFinder.

2007 IBM Haifa Verification Conference Award for most Exciting Research Contribution of the last 2 years in Software Verification and Testing.

2009 JPF won The Federal Laboratory Consortium for Technology Transfer (FLC) Far West Outstanding Technology Development award
(<http://www.federallabs.org/>)

2014 Most Influential Paper Award of the International Conference on Automated Software Engineering, for the 2000 paper "Model Checking Programs".

REFERENCES

Dr. Corina Pasareanu
Senior Researcher, CMU,
NASA Ames Research Center,
Moffett Field, CA 94040
corina.s.pasareanu@nasa.gov, +1-650-604-4767

Prof Matt Dwyer
Department of Computer Science and Engineering University of Nebraska
256 Avery Hall
Lincoln, NE 68588-0115
dwyer@cse.unl.edu, +1-402-472-2186

Prof Mats Heimdahl
Department of Computer Science and Engineering University of Minnesota
4-192 EE/CSci Bldg. 200 Union Street
S.E. Minneapolis, Minnesota 55455
heimdahl@cs.umn.edu, +1-612-625-2068