

# Curriculum Vitae - Nils Jansen

## Personal information

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Name Nils Jansen  
Email [n.jansen@science.ru.nl](mailto:n.jansen@science.ru.nl)  
Website <http://nilsjansen.org>  
  
Born April 22, 1982—Simmerath, Germany  
Nationality German

## Appointments held

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Since June 2017 Assistant Professor at the Radboud University Nijmegen, The Netherlands  
Jan 2017– May 2017 Research Associate at the University of Texas at Austin with Prof. Dr. Ufuk Topcu  
2016–2017 Postdoctoral Research Fellow at the University of Texas at Austin with Prof. Dr. Ufuk Topcu  
2015–2016 Postdoctoral Researcher at RWTH Aachen University with Prof. Dr. Ir. Joost-Pieter Katoen  
2014–2015 Research Assistant at RWTH Aachen University with Prof. Dr. Ir. Joost-Pieter Katoen  
2009–2013 Research Assistant and PhD Student at RWTH Aachen University with Prof. Dr. Erika Ábrahám

## Education

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2015 PhD in Computer Science (*summa cum laude*)  
Thesis: *Counterexamples in Probabilistic Verification*, supervised by Prof. Dr. Erika Ábrahám and Prof. Dr. Ir. Joost-Pieter Katoen  
2009 Diploma in Computer Science with minor business administration  
Thesis: *Automaton-definable Tree Relations with Cardinality Constraints*, supervised by Prof. Dr. Dr.h.c. Wolfgang Thomas

## Awards

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[Borchers Badge](#) of RWTH Aachen University for PhD examination “with distinction”

## Research

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### *Area of specialization*

- Formal verification
- Analysis and synthesis of stochastic systems
- Probabilistic programs
- Formal methods and control theory
- Formal methods for robotics and machine learning

## Professional activities

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Program chair and organization of a workshop colocated with CAV 2017: FEVER—Formal approaches to Explainable VERification

Organization of Dagstuhl Seminar 18121: Machine Learning and Model Checking Join Forces

External reviewer for ACC, ATVA, CAV, CDC, CONCUR, FACS, FM, FMOODS–FORTE, FORMATS, FSEN, FSTTCS, FTSCS, HSCC, IFM, Petri Nets, QEST, SIMULTECH, Journal of Systems and Software, International Journal of Robotics Research, TACAS, TASE, Theoretical Computer Science, IEEE Transactions of Reliability, VMCAI

2014–2016	Member of the examination board in Computer Science at RWTH Aachen University
2011–2015	Member of the commission for teaching in Computer Science at RWTH Aachen University
2010–2011	Member of the steering committee of the graduate school AlgoSyn
2011	Participation in local organization for CONCUR 2011, QEST 2011 and TGC 2011

## Peer-reviewed publications

- [Cal+17] Radu Calinescu, Marco Autili, Javier Cámara, Antinisca Di Marco, Simos Gerasimou, Paola Inverardi, Alexander Perucci, Nils Jansen, Joost-Pieter Katoen, Marta Kwiatkowska, et al. “Synthesis and Verification of Self-aware Computing Systems”. In: *Self-Aware Computing Systems*. Springer International Publishing, 2017, pp. 337–373.
- [Cub+17] Murat Cubuktepe, Nils Jansen, Sebastian Junges, Joost-Pieter Katoen, Ivan Papusha, Hasan A. Poonawala, and Ufuk Topcu. *Sequential Convex Programming for the Efficient Verification of Parametric MDPs*. In: *TACAS*. Vol. 10206. LNCS. 2017, pp. 133–150.
- [JCT17] Nils Jansen, Murat Cubuktepe, and Ufuk Topcu. *Synthesis of Shared Control Protocols with Provable Safety and Performance Guarantees*. In: *ACC*. IEEE, 2017, pp. 1866–1873.

- [Win+17] Leonore Winterer, Sebastian Junges, Ralf Wimmer, Nils Jansen, Ufuk Topcu, Joost-Pieter Katoen, and Bernd Becker. *Motion Planning under Partial Observability using Game-Based Abstraction*. In: *CDC*. to appear. 2017.
- [Jan+16a] Nils Jansen, Christian Dehnert, Benjamin Lucien Kaminski, Joost-Pieter Katoen, and Lukas Westhofen. *Bounded Model Checking for Probabilistic Programs*. In: *ATVA*. Vol. 9938. LNCS. 2016, pp. 68–85.
- [Jun+16a] Sebastian Junges, Nils Jansen, Christian Dehnert, Ufuk Topcu, and Joost-Pieter Katoen. *Safety-Constrained Reinforcement Learning for MDPs*. In: *TACAS*. Vol. 9636. LNCS. Springer, 2016, pp. 130–146.
- [Jun+16b] Sebastian Junges, Nils Jansen, Joost-Pieter Katoen, and Ufuk Topcu. *Probabilistic Verification for Cognitive Models*. In: *CDCAS*. AAI Technical Reports FS-16. AAI Press, 2016.
- [Leo+16] Francesco Leofante, Simone Vuotto, Erika Ábrahám, Armando Tacchella, and Nils Jansen. *Combining Static and Runtime Methods to Achieve Safe Standing-Up for Humanoid Robots*. In: *ISOLA*. Vol. 9952. LNCS. 2016, pp. 496–514.
- [Qua+16a] Tim Quatmann, Christian Dehnert, Nils Jansen, Sebastian Junges, and Joost-Pieter Katoen. *Parameter Synthesis for Markov Models: Faster Than Ever*. In: *ATVA*. Vol. 9938. LNCS. 2016, pp. 50–67.
- [Deh+15] Christian Dehnert, Sebastian Junges, Nils Jansen, Florian Corzilius, Matthias Volk, Harold Bruintjes, Joost-Pieter Katoen, and Erika Abraham. *PROPhESY: A PRObabilistic ParamETER SYnthesis Tool*. In: *CAV*. Vol. 9206. 2015, pp. 214–231.
- [Jan15b] Nils Jansen. “Counterexamples in Probabilistic Verification”. Dissertation. RWTH Aachen University, 2015.
- [Jan+15b] Nils Jansen, Benjamin Lucien Kaminski, Joost-Pieter Katoen, Federico Olmedo, Friedrich Gretz, and Annabelle McIver. *Conditioning in Probabilistic Programming*. In: *Electr. Notes Theor. Comput. Sci.* 319 (2015), pp. 199–216.
- [Kat+15] Joost-Pieter Katoen, Friedrich Gretz, Nils Jansen, Benjamin Lucien Kaminski, and Federico Olmedo. *Understanding Probabilistic Programs*. In: *Correct System Design - Symposium in Honor of Ernst-Rüdiger Olderog on the Occasion of His 60th Birthday*. Vol. 9360. LNCS. Springer, 2015, pp. 15–32.
- [Pat+15] Shashank Pathak, Erika Ábrahám, Nils Jansen, Armando Tacchella, and Joost-Pieter Katoen. *A Greedy Approach for the Efficient Repair of Stochastic Models*. In: *NFM*. Vol. 9058. LNCS. Springer, 2015, pp. 295–309.
- [Qua+15] Tim Quatmann, Nils Jansen, Christian Dehnert, Ralf Wimmer, Erika Abraham, Joost-Pieter Katoen, and Bernd Becker. *Counterexamples for Expected Rewards*. In: *FM*. Vol. 9109. LNCS. Springer, 2015, pp. 435–452.
- [Wim+15] Ralf Wimmer, Nils Jansen, Erika Abraham, and Joost-Pieter Katoen. *High-level Counterexamples for Probabilistic Automata*. In: *Logical Methods in Computer Science* 11.1:15 (2015).

- [Abr+14] Erika Ábrahám, Bernd Becker, Christian Dehnert, Nils Jansen, Joost-Pieter Katoen, and Ralf Wimmer. *Counterexample Generation for Discrete-Time Markov Models: An Introductory Survey*. In: *SFM*. Vol. 8483. LNCS. Springer, 2014, pp. 65–121.
- [Deh+14] Christian Dehnert, Nils Jansen, Ralf Wimmer, Erika Ábrahám, and Joost-Pieter Katoen. *Fast Debugging of PRISM Models*. In: *ATVA*. Vol. 8837. LNCS. Springer, 2014, pp. 146–162.
- [Jan+14a] Nils Jansen, Florian Corzilius, Matthias Volk, Ralf Wimmer, Erika Ábrahám, Joost-Pieter Katoen, and Bernd Becker. *Accelerating Parametric Probabilistic Verification*. In: *QEST*. Vol. 8657. LNCS. Springer, 2014, pp. 404–420.
- [Jan+14b] Nils Jansen, Ralf Wimmer, Erika Ábrahám, Barna Zajzon, Joost-Pieter Katoen, Bernd Becker, and Johann Schuster. *Symbolic counterexample generation for large discrete-time Markov chains*. In: *Science of Computer Programming* 91.A (1, 2014), pp. 90–114.
- [Wim+14] Ralf Wimmer, Nils Jansen, Erika Ábrahám, Joost-Pieter Katoen, and Bernd Becker. *Minimal counterexamples for linear-time probabilistic verification*. In: *Theoretical Computer Science* 549 (2014), pp. 61–100.
- [NJ13] Daniel Neider and Nils Jansen. *Regular Model Checking Using Solver Technologies and Automata Learning*. In: *NFM*. Vol. 7871. LNCS. Springer, 2013, pp. 16–31.
- [Wim+13a] Ralf Wimmer, Nils Jansen, Andreas Vorpahl, Erika Ábrahám, Joost-Pieter Katoen, and Bernd Becker. *High-level Counterexamples for Probabilistic Automata*. In: *QEST*. Vol. 8054. LNCS. Springer, 2013, pp. 18–33.
- [Jan+12b] Nils Jansen, Erika Ábrahám, Matthias Volk, Ralf Wimmer, Joost-Pieter Katoen, and Bernd Becker. *The COMICS Tool – Computing Minimal Counterexamples for DTMCs*. In: *ATVA*. Vol. 7561. LNCS. Springer, 2012, pp. 349–353.
- [Jan+12c] Nils Jansen, Erika Ábrahám, Barna Zajzon, Ralf Wimmer, Johann Schuster, Joost-Pieter Katoen, and Bernd Becker. *Symbolic Counterexample Generation for Discrete-time Markov Chains*. In: *FACS*. Vol. 7684. LNCS. Springer, 2012, pp. 134–151.
- [Wim+12c] Ralf Wimmer, Nils Jansen, Erika Ábrahám, Joost-Pieter Katoen, and Bernd Becker. *Minimal Critical Subsystems for Discrete-Time Markov Models*. In: *TACAS*. Vol. 7214. LNCS. Springer, 2012, pp. 299–314.
- [Abr+11] Erika Ábrahám, Nadine Bergner, Philipp Brauner, Florian Corzilius, Nils Jansen, Thiemo Leonhardt, Ulrich Loup, Johanna Nellen, and Ulrik Schroeder. *On Collaboratively Conveying Computer Science to Pupils*. In: *KOLI*. ACM. 2011, pp. 132–137.
- [Bra+11a] Bettina Braitling, Ralf Wimmer, Bernd Becker, Nils Jansen, and Erika Ábrahám. *Counterexample Generation for Markov Chains using SMT-based Bounded Model Checking*. In: *FMOODS/FORTE*. Vol. 6722. LNCS. Springer, 2011, pp. 75–89.
- [Jan+11a] Nils Jansen, Erika Ábrahám, Jens Katelaan, Ralf Wimmer, Joost-Pieter Katoen, and Bernd Becker. *Hierarchical Counterexamples for Discrete-Time Markov Chains*. In: *ATVA*. Vol. 6996. LNCS. Springer, 2011, pp. 443–452.

- [Abr+10a] Erika Ábrahám, Philipp Brauner, Nils Jansen, Thiemo Leonhardt, Ulrich Loup, and Ulrik Schroeder. *Podcastproduktion als kollaborativer Zugang zur theoretischen Informatik*. In: *DeLFI*. Vol. 169. LNI. Duisburg: Gesellschaft für Informatik, 2010, pp. 239–251.
- [Abr+10b] Erika Ábrahám, Nils Jansen, Ralf Wimmer, Joost-Pieter Katoen, and Bernd Becker. *DTMC Model Checking by SCC Reduction*. In: *QEST*. IEEE Computer Society, 2010, pp. 37–46.

### Further publications and technical reports

- [Deh+16] Christian Dehnert, Sebastian Junges, Nils Jansen, Florian Corzilius, Matthias Volk, Joost-Pieter Katoen, Erika Ábrahám, and Harold Buntjes. *Parameter Synthesis for Probabilistic Systems*. In: *MBMV*. Albert-Ludwigs-Universität Freiburg, 2016, pp. 72–74.
- [JCT16] Nils Jansen, Murat Cubuktepe, and Ufuk Topcu. *Synthesis of Shared Control Protocols with Provable Safety and Performance Guarantees*. In: *CoRR* abs/1610.08500 (2016). URL: <https://arxiv.org/abs/1610.08500v1>.
- [Jan+16b] Nils Jansen, Christian Dehnert, Benjamin Lucien Kaminski, Joost-Pieter Katoen, and Lukas Westhofen. *Bounded Model Checking for Probabilistic Programs*. In: *CoRR* abs/1605.04477 (2016). URL: <https://arxiv.org/abs/1605.04477>.
- [Jun+16c] Sebastian Junges, Nils Jansen, Ufuk Topcu, and Joost-Pieter Katoen. *Probabilistic Model Checking for Complex Cognitive Tasks – A case study in human-robot interaction*. In: *CoRR* (2016).
- [Qua+16b] Tim Quatmann, Christian Dehnert, Nils Jansen, Sebastian Junges, and Joost-Pieter Katoen. *Parameter Synthesis for Markov Models: Faster Than Ever*. In: *CoRR* abs/1602.05113 (2016). URL: <https://arxiv.org/abs/1602.05113>.
- [Gre+15] Friedrich Gretz, Nils Jansen, Benjamin Lucien Kaminski, Joost-Pieter Katoen, Annabelle McIver, and Federico Olmedo. *Conditioning in Probabilistic Programming*. In: *CoRR* abs/1504.00198 (2015). URL: <http://arxiv.org/abs/1504.00198>.
- [Jan15a] Nils Jansen. *A Greedy Approach for the Efficient Repair of Stochastic Models*. In: *Frontiers of Formal Methods*. Vol. AIB-2011-11. RWTH Aachen University, 2015.
- [Jan+15a] Nils Jansen, Benjamin Lucien Kaminski, Joost-Pieter Katoen, Christoph Matheja, and Federico Olmedo. *Probabilistic Programs - A Natural Model for Approximate Computations*. In: *AC15 - Workshop on Approximate Computing*. Paderborn, Germany, Oct. 2015.
- [Jun+15] Sebastian Junges, Nils Jansen, Christian Dehnert, Ufuk Topcu, and Joost-Pieter Katoen. *Safety-Constrained Reinforcement Learning for MDPs*. In: *CoRR* abs/1510.05880 (2015). URL: <http://arxiv.org/abs/1510.05880>.
- [Jan+13] Nils Jansen, Florian Corzilius, Matthias Volk, Ralf Wimmer, Erika Ábrahám, Joost-Pieter Katoen, and Bernd Becker. *Accelerating Parametric Probabilistic Verification*. In: *CoRR* abs/1312.3979 (2013). URL: <https://arxiv.org/abs/1312.3979>.

- [Wim+13b] Ralf Wimmer, Nils Jansen, Andreas Vorpahl, Erika Ábrahám, Joost-Pieter Katoen, and Bernd Becker. *High-level Counterexamples for Probabilistic Automata*. In: *CoRR* abs/1305.5055 (2013). URL: <https://arxiv.org/abs/1305.5055>.
- [Jan+12a] Nils Jansen, Erika Ábrahám, Maik Scheffler, Matthias Volk, Andreas Vorpahl, Ralf Wimmer, Joost-Pieter Katoen, and Bernd Becker. *The COMICS Tool - Computing Minimal Counterexamples for Discrete-time Markov Chains*. In: *CoRR* abs/1206.0603 (2012). URL: <https://arxiv.org/abs/1206.0603>.
- [Wim+12a] Ralf Wimmer, Nils Jansen, Erika Ábrahám, Joost-Pieter Katoen, and Bernd Becker. *Minimal Counterexamples for Refuting  $\omega$ -Regular Properties of Markov Decision Processes*. Reports of SFB/TR 14 AVACS 88. ISSN: 1860-9821, <http://www.avacs.org>. Sept. 2012.
- [Wim+12b] Ralf Wimmer, Nils Jansen, Erika Ábrahám, Joost-Pieter Katoen, and Bernd Becker. *Minimal Critical Subsystems as Counterexamples for  $\omega$ -Regular DTMC Properties*. In: *MBMV*. Verlag Dr. Kovač, 2012, pp. 169–180.
- [Bra+11b] Bettina Braitling, Ralf Wimmer, Bernd Becker, Nils Jansen, and Erika Ábrahám. *SMT-based Counterexample Generation for Markov Chains*. In: *MBMV*. Offis Oldenburg, 2011, pp. 19–28. ISBN: 978-3-00-033820-5.
- [Jan+11b] Nils Jansen, Erika Ábrahám, Jens Katelaan, Ralf Wimmer, Joost-Pieter Katoen, and Bernd Becker. *Hierarchical Counterexamples for Discrete-time Markov Chains*. Tech. rep. AIB-2011-11. RWTH Aachen University, 2011.