

Sebastian Krings

Curriculum Vitae

Current Positions

Academia

since 04.2018 Postdoc - Competence Centre for Information Security
Niederrhein University of Applied Sciences
Parental leave 12.2018 – 02.2019

Industry

since 04.2018 Network and Information Security Specialist
Lukas Hospital Neuss
Parental leave 12.2018 – 02.2019

since 2006 Freelance work in programming education, training and consulting

Work Experience

08.2017–03.2018 Postdoc - Chair for Programming Languages and Software Engineering
Heinrich-Heine-University Düsseldorf

12.2012–07.2017 Research Fellow
Chair for Programming Languages and Software Engineering

03.2012–08.2012 Research Assistant
Chair for Mathematics and Applied Fields

03.2011–09.2011 Research Assistant
Chair for Mathematics and Applied Fields

08.2010–12.2010 Research Assistant
Chair for Programming Languages and Software Engineering

Academic Education

Ph.D. Computer Science, *magna cum laude*

12.2012–06.2017 Heinrich-Heine-University Düsseldorf
Thesis Towards Infinite-State Symbolic Model Checking for B and Event-B

M.Sc. Computer Science, *excellent (A)*

02.2010–10.2012 an der Heinrich-Heine-University Düsseldorf
Thesis Inference of Physical Units in Formal Models, *very good (B)*

B.Sc. Mathematik, *good (C)*

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- 04.2008–02.2012 an der Heinrich-Heine-University Düsseldorf
 Thesis Mathematical Modeling of Wrist Joint Mobility, *very good (B)*
 B.Sc. Informatik, *excellent (A)*
- 10.2006–02.2010 an der Heinrich-Heine-University Düsseldorf
 Thesis Code Coverage Analysis for Prolog, *very good (B)*

Further Education

- 11.2018 *Applied Data Science with Python*
 University of Michigan via Coursera
- 11.2018 *ISMS Auditor/LEAD-Auditor ISO/IEC 27001*
 HS Niederrhein
- 03.2018 Specialization Certificate *Professionelle Lehrkompetenz für die Hochschule*
(Professional teaching competence for universities)
 Netzwerk Hochschuldidaktik NRW
- 06.2017 *Cambridge English: Proficiency*
 University of Cambridge via VHS Düsseldorf
- 02.2017 Extended Certificate *Professionelle Lehrkompetenz für die Hochschule*
(Professional teaching competence for universities)
 Netzwerk Hochschuldidaktik NRW
- 10.2016 Basic Certificate *Professionelle Lehrkompetenz für die Hochschule*
(Professional teaching competence for universities)
 Netzwerk Hochschuldidaktik NRW

Rewards & Scholarships

- 2015 Best Paper Award for *From Failure to Proof: The ProB Disprover for B and Event-B*, Software Engineering and Formal Methods
- 10.2010–09.2011 NRW Scholarship Program „Chancen Nutzen“
 ARAG Insurance

Funding and Industry Projects

Funding

- 2018 *GENERATED - GENERation of ReAlistic Artificial TEst Data*. Project in cooperation with Periplus Instruments, internal start-up funding by Niederrhein University of Applied Sciences, 1 year, 15.000€

Project Involvement

- 2019 EFRE Projekt *CPS-Labor MG 4.0* by Niederrhein University of Applied Science
- 2017 Industry project *Virtual Block Function for Hybrid L3* by Thales Berlin and Heinrich-Heine-University
- 2012–2014 EU FP7-ICT Projekt *ADVANCE - Advanced Design and Verification Environment for Cyber-physical System Engineering*

Academic Services

Reviewing

- Journals IEEE Access, Software Tools for Technology Transfer, Theoretical Computer Science
- Conferences & Workshops RSSRail 2019, ABZ 2018, FM 2018, RSSRail 2017, LOPSTR 2016, ICLP 2016, IJCAI 2016, RSSRail 2016, SETS 2015, FM 2014

Event Organization

- 2019 Conference „Information Security Management in Hospitals“ as part of the European Cyber Security Month
Workshop „Ethical Hacking“ as part of the European Cyber Security Month
- 2018 Conference „Information Security Management in Hospitals“ as part of the European Cyber Security Month
Workshop „Ethical Hacking“ as part of the European Cyber Security Month

Self-Government

- 2017 Member of the appointments committee *Artificial Intelligence*

Conferences, Workshops and Schools Attended

- 2019 35th International Conference on Logic Programming, Las Cruces, USA
Declare 2019 – Conference on Declarative Programming, Cottbus, Germany
- 2018 26th International Workshop on Functional and Logic Programming (WFLP), Frankfurt, Germany
18th International Workshop on Automated Verification of Critical Systems (AVoCS), Oxford, GB
20th International Symposium on Practical Aspects of Declarative Languages (PADL), Los Angeles, USA
45th ACM SIGPLAN Symposium on Principles of Programming Languages (POPL), Los Angeles, USA
2nd InSite User Group Meeting, Brussels, Belgium
- 2017 Declare 2017 – Conference on Declarative Programming, Würzburg, Germany
- 2016 12th International Conference on integrated Formal Methods (iFM), Reykjavik, Iceland
PhD Symposium at iFM'16 on Formal Methods: Algorithms, Tools and Applications, Reykjavik, Iceland
5th International Conference on Abstract State Machines, Alloy, B, TLA, VDM and Z (ABZ), Linz, Austria
6th Rodin User and Developer Workshop, Linz, Austria
Leipzig Week of Declarative Programming, Leipzig, Germany

- 2014 1st Workshop on Formal-IDE (F-IDE), Grenoble, France
4th International Summer School on SAT/SMT, Semmering, Austria
20th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS), Grenoble, France
- 2013 11th International Conference on Software Engineering and Formal Methods (SEFM), Madrid, Spain
4th Rodin User and Developer Workshop, Turku, Finland
Summer School Marktoberdorf on Software Systems Safety, Marktoberdorf, Germany
3rd CHR Summer School, Berlin, Germany

Languages

German native

English fluent in written and spoken (CEFR Level C2)

Sebastian Krings

Publications

Book Chapters

- 2014 Michael Leuschel, Jens Bendisposto, Ivaylo Dobrikov, **Sebastian Krings** und Daniel Plagge. „From Animation to Data Validation: The ProB Constraint Solver 10 Years On“. In: *Formal Methods Applied to Complex Systems: Implementation of the B Method*. Hrsg. von Jean-Louis Boulanger. Hoboken, NJ: Wiley ISTE, 2014. Kap. 14, S. 427–446

Journal Articles

- 2019 **Sebastian Krings**, Michael Leuschel, Joshua Schmidt, David Schneider und Marc Frappier. „Translating Alloy and Extensions to Classical B“. In: *Science of Computer Programming* (2019). Accepted with minor revisions. To appear.
- Jessica Petrasch, Jan-Hendrik Oepen, **Sebastian Krings** und Moritz Gericke. „Writing a Model Checker in 80 Days: Reusable Libraries and Custom Implementation“. In: *Electronic Communications of the EASST* 76 (Apr. 2019)
- 2017 **Sebastian Krings** und Michael Leuschel. „Proof Assisted Bounded and Unbounded Symbolic Model Checking of Software and System Models“. In: *Science of Computer Programming* 158 (Aug. 2017)
- 2015 **Sebastian Krings** und Michael Leuschel. „Inferring Physical Units in Formal Models“. In: *Software & Systems Modeling* 16.1 (März 2015), S. 25–47

Conference and Workshop Proceedings

- 2019 Philipp Körner, Jens Bendisposto, Jannik Dunkelau, **Sebastian Krings** und Michael Leuschel. „Embedding High-Level Formal Specifications into Applications“. In: *Proceedings of the 23rd International Symposium on Formal Methods*. LNCS. To appear. Springer, 2019
- Falco Nogatz, Philipp Körner und **Sebastian Krings**. „Prolog Coding Guidelines: Status and Tool Support“. In: *Technical Communications of the 35th International Conference on Logic Programming*. To appear. 2019
- Sebastian Krings**, Joshua Schmidt, Patrick Skowronek, Jannik Dunkelau und Dierk Ehmke. „Towards Constraint Logic Programming over Strings for Test Data Generation“. In: *Proceedings Declare 2019 – Conference on Declarative Programming*. 2019

- Jannik Dunkelau, **Sebastian Krings** und Joshua Schmidt. „Automatic Backend Selection for ProB Using Deep Learning“. In: *Proceedings of the 11th Annual NASA Formal Methods Symposium*. Bd. 11460. LNCS. Springer, 2019
- Sebastian Krings**, Philipp Körner und Joshua Schmidt. „Experience Report on An Inquiry-Based Course on Model Checking“. In: *Tagungsband des 16. Workshops zu Software Engineering im Unterricht der Hochschulen*. Bd. 2358. CEUR. 2019
- 2018 Alexandros Efremidis, Joshua Schmidt, **Sebastian Krings** und Philipp Körner. „Measuring Coverage of Prolog Programs Using Mutation Testing“. In: *Proceedings of the 26th International Workshop on Functional and Logic Programming*. Bd. 11285. LNCS. Springer, 2018
- Joshua Schmidt, **Sebastian Krings** und Michael Leuschel. „Repair and Generation of Formal Models Using Synthesis“. In: *Proceedings of the 14th International Conference on Integrated Formal Methods*. Bd. 11023. LNCS. Springer, 2018
- Sebastian Krings**, Joshua Schmidt, Carola Brings, Marc Frappier und Michael Leuschel. „A Translation from Alloy to B“. In: *Proceedings of the 6th International Conference on Abstract State Machines, Alloy, B, TLA, VDM, and Z*. Bd. 10817. LNCS. Springer, 2018
- Dominik Hansen, Michael Leuschel, David Schneider, **Sebastian Krings**, Philipp Körner, Thomas Naulin, Nader Nayeri und Frank Skowron. „Using a Formal B Model at Runtime in a Demonstration of the ETCS Hybrid Level 3 Concept with Real Trains“. In: *Proceedings of the 6th International Conference on Abstract State Machines, Alloy, B, TLA, VDM, and Z*. Bd. 10817. LNCS. Springer, 2018
- Stefan Hallerstede, Miran Hasanagic, **Sebastian Krings**, Peter Gorm Larsen und Michael Leuschel. „From Software Specifications to Constraint Programming“. In: *Proceedings of the 16th International Conference on Software Engineering and Formal Methods*. Bd. 10886. LNCS. Springer, 2018
- Sebastian Krings**, Michael Leuschel, Philipp Körner, Stefan Hallerstede und Miran Hasanagic. „Three is a crowd: SAT, SMT and CLP on a chessboard“. In: *Proceedings of the 20th International Symposium on Practical Aspects of Declarative Languages*. Bd. 10702. LNCS. Springer, 2018
- 2017 **Sebastian Krings** und Philipp Körner. „plspec – A Specification Language for Prolog Data“. In: *Proceedings Declare 2017 – Conference on Declarative Programming*. Bd. 10997. LNCS. Springer, 2018
- 2016 **Sebastian Krings** und Michael Leuschel. „SMT Solvers for Validation of B and Event-B models“. In: *Proceedings of the 12th International Conference on Integrated Formal Methods*. Bd. 9681. LNCS. Springer, 2016

- Sebastian Krings** und Michael Leuschel. „Proof Assisted Symbolic Model Checking for B and Event-B“. In: *Proceedings of the 5th International Conference on Abstract State Machines, Alloy, B, TLA, VDM, and Z*. Bd. 9675. LNCS. Springer, 2016
- Joshua Schmidt, **Sebastian Krings** und Michael Leuschel. „Interactive Model Repair by Synthesis“. In: *Proceedings of the 5th International Conference on Abstract State Machines, Alloy, B, TLA, VDM, and Z*. Bd. 9675. LNCS. Springer, 2016
- Sebastian Krings** und Michael Leuschel. „Constraint Logic Programming over Infinite Domains with an Application to Proof“. In: *Proceedings of the 30th Workshop on (Constraint) Logic Programming*. Bd. 234. EPTCS. 2016
- 2015 **Sebastian Krings**, Jens Bendisposto und Michael Leuschel. „From Failure to Proof: The ProB Disprover for B and Event-B“. In: *Proceedings of the 13th International Conference on Software Engineering and Formal Methods*. Bd. 9276. LNCS. Springer, 2015
- 2014 **Sebastian Krings**, Jens Bendisposto und Michael Leuschel. „Turning Failure into Proof: Evaluating the ProB Disprover“. In: *Proceedings of the 1st International Workshop about Sets and Tools*. 2014
- Jens Bendisposto, **Sebastian Krings** und Michael Leuschel. „Who watches the watchers: Validating the ProB Validation Tool“. In: *Proceedings of the 1st Workshop on Formal-IDE*. Bd. 149. EPTCS. 2014
- 2013 **Sebastian Krings** und Michael Leuschel. „Inferring Physical Units in B Models“. In: *Proceedings of the 11th International Conference on Software Engineering and Formal Methods*. Bd. 8137. LNCS. Springer, 2013

Extended Abstracts

- 2019 **Sebastian Krings**, Michael Butler, Philipp Körner, Thierry Lecomte, Michael Leuschel und Laurent Voisin. *The History and Evolution of B and Event-B*. Extended Abstract and Talk at the History of Formal Methods Workshop (HFM 2019). 2019
- 2016 **Sebastian Krings**. *The Burden of High-Level Languages: Complicated Symbolic Model Checking*. PhD Symposium at iFM'16 on Formal Methods: Algorithms, Tools and Applications. 2016
- Sebastian Krings**. *Meta-Predicates for Rodin*. 6th Rodin User and Developer Workshop. 2016
- 2013 **Sebastian Krings**, Jens Bendisposto, Ivaylo Dobrikov und Michael Leuschel. „B constrained“. In: *Proceedings of the 4th Rodin User and Developer Workshop*. TUCS Lecture Notes. TUCS, 2013
- Jens Bendisposto, Joy Clark, Ivaylo Dobrikov, Philipp Körner, **Sebastian Krings**, Lukas Ladenberger, Michael Leuschel und Daniel Plagge. „ProB 2.0 Tutorial“. In: *Proceedings of the 4th Rodin User and Developer Workshop*. TUCS Lecture Notes. TUCS, 2013