Alexander Boll

Postdoctoral Researcher

Software Engineering Group,
University of Bern
Bern, Switzerland
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CONTACT

alexander.boll@unibe.ch
LinkedIn
GitHub
ORCID
Google Scholar
DBLP

SKILLS

Java, Python, MATLAB, Simulink, Coq, Git, Docker, Bash, LaTeX, Claude Code & other AI tools

LANGUAGES

German	native
English	fluent
French	B1
Portuguese	A2
Japanese	A2

PROFILE

Postdoctoral researcher in software engineering, working on merge conflict resolution and software variability, with a strong track record in model-based software engineering — particularly MATLAB/Simulink. My research develops practical tools (SMOKE, GRANDSLAM, ScoutSL) that lower the barrier to empirical research in model-based engineering, and studies how developers can be better supported in everyday version-control workflows.

EXPERIENCE

Jan 2026 – present

Postdoctoral Researcher
Software Engineering Group, University of Bern

- Prototype development (MATLAB, Python, Java)
- Writing and reviewing research papers
- Supervision of BSc, MSc, and co-supervision of PhD students
- Teaching support and exam assessment

Jan 2022 – Dec 2025

Doctoral Researcher
Software Engineering Group, University of Bern

- Prototype development (MATLAB, Python, Java)
- Writing and reviewing research papers
- Exam assessment and proctoring
- Literature research

Jul 2024 – Dec 2024

Research Developer
University of Duisburg-Essen / Gesellschaft für Informatik

- Contributor to the DFG project NFDIxCS (nfdixcs.org)
- Prototyping for model-based use cases
- Writing and reviewing research papers

Jun 2019 – Dec 2021

Research Associate
Humboldt University of Berlin (Model-Driven Software Engineering)

- Contributor to the DFG project SimuComp
- Prototype development (Python, Java)
- Writing and reviewing research papers
- Exam assessment and proctoring

Oct 2015 – May 2019

Student Research Assistant
Fraunhofer AISEC

- Java, Docker, CI, Bash, VirtualBox
- Programming, software testing and configuration
- Research, risk analysis, and documentation

Mar 2014 – Sep 2014

Student Assistant
Ctb Camtec GmbH

- Web development (HTML, CSS, PHP) and VB programming
- Windows Server, mail server, VMware administration

Sep 2009 – Sep 2011

Tutor
Humboldt University of Berlin (Algorithms and Complexity)

- Designed and graded exercises and exams
- Led tutorial sessions

Oct 2007 – May 2009

Student Assistant / Tutor
TU Berlin (Industrial Information Technology)
- Implemented evolutionary algorithms in C++
- Led tutorials for "Introduction to C++ for Engineers"
- Reviewed course materials, exercises, and exams

EDUCATION

Jun 2019 – Dec 2025

Dr. rer. nat. (PhD) in Computer Science
University of Bern (initially at Humboldt University of Berlin until Dec 2021)
Thesis: *Bridging the Data Desert: Mitigating Challenges of Model Accessibility in Simulink Research*
Advisor: Prof. Dr. Timo Kehrer · Defended Dec 2025 · doi.org/10.48549/7066

Oct 2006 – Feb 2019

Diplom / M.Sc. in Computer Science
Humboldt University of Berlin
Advisor: Dr. Kim Völlinger · Final grade 1.3 (*sehr gut* / very good; German scale, 1.0 best)
Thesis: *Formale Instanzverifikation zertifizierender verteilter Algorithmen*

1997 – 2006

Abitur
Rosa-Luxemburg-Oberschule, Berlin-Pankow
Final grade 1.6 (*gut* / good; German scale, 1.0 best)

AWARDS

EASE 2024

Distinguished Paper Award
for "Towards Semi-Automated Merge Conflict Resolution: Is It Easier Than We Expected?"

PUBLICATIONS

Journal Articles

[1] **Alexander Boll**, Manuel Ohrndorf, Timo Kehrer. "SMOKE2.0 Whitebox Anonymization of Sensitive Information in Simulink with Structure Preservation". *SoSyM*, 2026. doi:10.1007/s10270-026-01381-x.

[2] Roman Bögli, **Alexander Boll**, Alexander Schultheiß, Timo Kehrer. "Community-Driven Variability: Characterizing a new Software Variability Paradigm". *Automated Software Engineering*, 2026. doi:10.1007/s10515-026-00594-0.

[3] **Alexander Boll**, Pooja Rani, Alexander Schultheiß, Timo Kehrer. "Beyond Code: Is There a Difference Between Comments in Visual and Textual Languages?". *JSS*, 2024. doi:10.1016/j.jss.2024.112087.

[4] Tiago Amorim, **Alexander Boll**, Ferry Bachmann, Timo Kehrer, Andreas Vogelsang, Hartmut Pohlheim. "Simulink Bus Usage in Practice: An Empirical Study". *JOT*, 2023. doi:10.5381/jot.2023.22.2.a12.

[5] Alexander Schultheiß, Paul Bittner, **Alexander Boll**, Lars Grunske, Thomas Thüm, Timo Kehrer. "RaQuN: A Generic and Scalable n-Way Model Matching Algorithm". *SoSyM*, 2022. doi:10.1007/s10270-022-01062-5.

[6] **Alexander Boll**, Nicole Vieregg, Timo Kehrer. "Replicability of Experimental Tool Evaluations in Model-Based Software and Systems

Engineering with MATLAB/Simulink". *ISSE*, 2022. doi:10.1007/s11334-022-00442-w.

[7] **Alexander Boll**, Florian Brokhausen, Tiago Amorim, Andreas Vogelsang, Timo Kehrer. "Characteristics, Potentials, and Limitations of Open Source Simulink Projects for Empirical Research". *SoSyM*, 2021. doi:10.1007/s10270-021-00883-0.

[8] Alexander Schultheiß, **Alexander Boll**, Timo Kehrer. "Comparison of Graph-Based Model Transformation Rules". *JOT*, 2020. doi:10.5381/jot.2020.19.2.a3.

Conference Papers

[1] **Alexander Boll**. "GRANDSLAM: Linearly Scalable Model Synthesis". *ICST*, 2026.

[2] Manuel Ohrndorf, **Alexander Boll**, Roman Bögli, Timo Kehrer. "Turning Merge Conflicts Into Conflict-Induced Variability". *ICSE*, 2026. doi:10.1145/3786582.3786840.

[3] Alexander Schultheiß, **Alexander Boll**, Paul Bittner, Sandra Greiner, Thomas Thüm, Timo Kehrer. "Decades of GNU Patch and Git Cherry-Pick: Can We Do Better?". *ICSE*, 2026. doi:10.1145/3744916.3764537.

[4] Roman Bögli, **Alexander Boll**, Alexander Schultheiß, Timo Kehrer. "Beyond Software Families: Community Driven Variability". *FSE*, 2025. doi:10.1145/3696630.3728501.

[5] Pablo Valenzuela-Toledo, Chuyue Wu, Sandro Hernández, **Alexander Boll**, Roman Machacek, Sebastiano Panichella, Timo Kehrer. "Explaining GitHub Actions Failures with Large Language Models: Challenges, Insights, and Limitations". *ICPC*, 2025. doi:10.1109/ICPC66645.2025.00037.

[6] **Alexander Boll**, Timo Kehrer, Michael Goedicke. "SMOKE: Simulink Model Obfuscator Keeping Structure". *MODELS*, 2024. doi:10.1145/3652620.3687788.

[7] **Alexander Boll**, Yael van Dok, Manuel Ohrndorf, Alexander Schultheiß, Timo Kehrer. "Towards Semi-Automated Merge Conflict Resolution: Is It Easier Than We Expected?". *EASE*, 2024. doi:10.1145/3661167.3661197. Distinguished Paper Award.

[8] Sohil Lal Shrestha, **Alexander Boll**, Timo Kehrer, Christoph Csallner. "ScoutSL: An Open-Source Simulink Search Engine". *MODELS*, 2023. doi:10.1109/MODELS-C59198.2023.00022.

[9] Sohil Lal Shrestha, **Alexander Boll**, Shafiul Azam Chowdhury, Timo Kehrer, Christoph Csallner. "EvoSL: A Large Open-Source Corpus of Changes in Simulink Models & Projects". *MODELS*, 2023. doi:10.1109/MODELS58315.2023.00024.

[10] **Alexander Boll**, Timo Kehrer. "On the Replicability of Experimental Tool Evaluations in Model-Based Development". *ICSMM*, 2020. doi:10.1007/978-3-030-58167-1_9.

Preprints

[1] Pooja Rani, Jan-Andrea Bard, June Sallou, **Alexander Boll**, Timo Kehrer, Alberto Bacchelli. "Can We Make Code Green? Understanding Trade-Offs in LLMs vs. Human Code Optimizations". *arXiv*, 2025. doi:10.48550/arXiv.2503.20126.

Theses

[1] **Alexander Boll**. "Bridging the Data Desert: Mitigating Challenges of Model Accessibility in Simulink Research". *PhD Thesis, University of Bern*, 2025. doi:10.48549/7066.

[2] **Alexander Boll**. "Formale Instanzverifikation zertifizierender verteilter Algorithmen". *MSc Thesis (in German)*, 2019.

FUNDED RESEARCH PROJECTS

2024 – 2027	**VariantSync II** SNSF-funded research project on the automated synchronization of software variants in clone-and-own development; in collaboration with Prof. Dr. Thomas Thüm (TU Braunschweig).
Oct 2023 – Sep 2027	**Merge++** SNSF-funded research project on merge conflict resolution (SNSF grant 219719, PI: Timo Kehrer). Contributed substantially to the successful grant proposal.
2019 – 2021	**SimuComp** DFG-funded research project on the comparison and versioning of MATLAB/Simulink models (Model-Driven Software Engineering group, Humboldt University of Berlin).

STUDENT SUPERVISION

2026	**Volodymyr Kachuriak** (MSc) — CI/CD-Enhanced Conflict Resolution Co-supervised with Timo Kehrer
2025	**Judi Abdullah** (MSc) — An Empirical Study of Context Modifications in Git Merge Conflict Resolutions Co-supervised with Timo Kehrer
2023	**Yael van Dok** (BSc) — In Conflict: An Empirical Study of Merge Conflict Resolutions in Open-Source Projects Co-supervised with Timo Kehrer
2022	**Severin Buchser** (BSc) — An Empirical Study on the Human Role in Merge Conflict Resolution Co-supervised with Timo Kehrer

TEACHING

2022–present	**Seminar Software Engineering**, University of Bern Supervision of various student seminar projects
2025, 2026	**Programmieren 2 (P2)**, University of Bern Occasional lecture and exercise substitute
2009, 2010, 2011	**Algorithms and Complexity**, Humboldt University of Berlin Tutor — designed and graded exercises and exams, led tutorial sessions
2007, 2008, 2009	**Introduction to C++ for Engineers**, TU Berlin Tutor — led tutorials, reviewed course materials, exercises, and exams

SERVICE

2024	**Web Chair**, VaMoS 2024

Reviewing

Reviewer for ASE, EASE, ICSE, MODELS, SoSyM, ICSME, FSE, TSE, VaMoS, ESWA, SPE, J.UCS, JOT (2020–2026).