

Curriculum Vitae

Contact Details

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Research Interests Software engineering — self-adaptive systems, software architecture, requirements engineering, cyber-physical systems, empirical software engineering, software processes

Education

April 2016– April 2020 **Ph.D., Computer Science and Engineering** *Software Engineering Division, Chalmers University of Technology, Gothenburg, Sweden.*
Funded by the Wallenberg AI, Autonomous Systems and Software Program (WASP)
Thesis title: Living boundary objects to support agile inter-team coordination at scale
Advisors: Prof. Patrizio Pelliccione, Prof. Eric Knauss

October 2013– March 2016 **M.Sc., Computer Science** *Paderborn University, Paderborn, Germany.*
Passed with distinction
2014–2015: Exchange year, Universidad de Alcalá, Spain.
Master's Thesis at Chalmers University of Technology, Gothenburg, Sweden.

October 2010– September 2013 **B.Sc., Computer Science** *Paderborn University, Paderborn, Germany.*
Passed with distinction
2012–2013: Exchange year, Mälardalen University, Västerås, Sweden

Positions

since August 2022 **Assistant Professor** *Chalmers University of Technology, Gothenburg, Sweden.*
Tenure-track position with 20% teaching and 80% research

August 2020–July 2022 **Postdoctoral researcher** *Carnegie Mellon University, Pittsburgh, USA.*
WASP Postdoctoral Scholarship by the Knut and Alice Wallenberg Foundation
Research group leader: David Garlan, Institute for Software Research

April 2016– July 2020 **Application engineer and strategy analyst** *Systemite AB, Gothenburg, Sweden.*
Elicitation and analysis of customers' requirements, configuration of the information management solution SystemWeaver, (meta-)modeling, user support, trainings and workshops on metamodeling. Long-term collaborations with Volvo Car Corporation, Volvo Group Trucks Technology, and Zenuity AB.

February 2013– July 2013 **Bachelor thesis student and intern** *ABB Corporate Research, Västerås, Sweden.*

Awards and Honors

2019 Best Paper Award at PROFES'19

2019 Best Paper Award at ICSA'19

2018 Best Paper Award at ICSSP'18 (Research Track)

2013 Award for excellence in studies. Given to the graduating B.Sc. Computer Science student with the highest average score at Paderborn University.

- 2013 Emeriti Prize 2013 for academic excellence by former professors of Paderborn University. Scholarship for 12 months.
- 2010–2015 Deutschlandstipendium, academic excellence scholarship by the Federal Government of Germany and German businesses/foundations: 18,000 EUR

Grants

- 2022–2024 **Wallenberg AI, Autonomous Systems and Software Program**. PI. Repatriation grant for two-year research funding for my position. 1,908,000 SEK.
- May–August 2022 **National Science Foundation/Carnegie Mellon University**. Funding for two undergraduate students in the REUSE program at CMU: 20,000 USD.
- 2020–2022 **Wallenberg AI, Autonomous Systems and Software Program**. PI. Grant for my postdoctoral research at Carnegie Mellon University: 168,000 USD.
- 2017 **SIGSOFT CAPS award**. Main applicant. Merit-based travel grant for attending ICSE'17: 1,200 USD.

Teaching and Mentoring

- April–May 2022 **Module instructor and main lecturer** *Traceability module in the course CEN 6075: Software Requirements Engineering. Lecturing, design of learning activities, and assessment*, Florida Atlantic University.
- April–August 2022 **School of Computer Science Mentoring Program** *Mentoring of three undergraduate students working on individual research projects (reinforcement learning for self-adaptive systems, interface design, dynamic constraint consolidation)*, Carnegie Mellon University.
- May–August 2022 **Research Experiences for Undergraduates (REU) Program** *Mentoring of two students working on research projects (AI visualization, context-aware systems). Initiative to support students who are traditionally underrepresented in computer science*. Carnegie Mellon University.
- January–June 2021 **Course instructor and main lecturer** *7.5 hp Master's course "Software language engineering for domain-specific languages" (DAT240 / DIT975)*, Responsible for the design of lectures, learning activities, and assessment. Coordination and advising of teaching assistants. Chalmers University of Technology.
- April–May 2020 **Metamodeling workshop series** *Interactive teaching sessions with approx. 15 architects/developers. Topic: Metamodeling with SystemWeaver, Systemite AB, Volvo Car Corporation*.
- Spring 2019 **Master thesis supervision** *Topic: Lightweight traceability for agile systems engineering*, Chalmers University of Technology. In collaboration with Polytechnic University of Bari, Italy and Zenuity AB.
- Spring 2017 **Teaching assistant** *WASP Ph.D. Course on Software Engineering and Cloud Computing, Model-Driven Software Development Module. Conceptual design and creation of lab exercises*.
- Winter 2011 **Teaching assistant** *Software Design (compulsory B.Sc. Computer Science course)*, Tutoring a lab/exercise group (focusing on UML diagrams, design patterns, software architecture). Paderborn University.

Pedagogical training

- since 2016 **'Teaching, learning, and evaluation', team leadership training, research ethics and sustainable development, advanced communication**. 9 hp.

Invited Talks

- April 2022 **Explaining Quality Tradeoffs Using Machine Learning Techniques** *Lockheed Martin.*
- January 2022 **Explainable Systems: Improving Confidence In Autonomous Systems** *Chief of Naval Research and Rear Admiral Lorin Selby, US Navy.*
- December 2021 **Explainable Systems: Improving Confidence In Autonomous Systems** *Vice Admiral Scott Cohn, US Navy.*
- November 2021 **Model-Based Explanation for Automated Decision Making** *Fall'21 Science of Security Quarterly Lablet Meeting. With David Garlan.*
- August 2021 **Collaborative Software Engineering Techniques for Multi-Stakeholder Autonomous Systems** *WASP Summer School.*
- May 2020 **Living boundary objects to support agile inter-team coordination at scale** *Veoneer, System and Function Development team.*
- November 2019 **Boundary Objects for Agile Architecting in Automotive Companies** *Volvo Car Corporation, Solution Architects' Community of Practice.*
- November 2019 **Boundary Objects in Large-Scale Agile Development** *Ericsson Cloud Operations, Singapore.*
- November 2019 **Boundary Objects in Large-Scale Agile Development** *Singapore Telecommunications, Singapore.*
- October 2019 **Architecture Descriptions as Boundary Objects in Large-Scale Agile Development** *Karlsruhe Institute of Technology, Germany.*
- April 2019 **Boundary Objects in Agile Automotive Systems Engineering** *University of L'Aquila, Italy.*
- November 2018 **Aligning Systems Engineering Practices at Scale using Boundary Objects** *Software Center Project 26 on API Strategies.*
- October 2017 **Managing Systems and Software Engineering Artifacts for Autonomous Systems** *Cruise Automation. U.S. Cruise LLC, USA.*
- April 2017 **Traceability and Boundary Objects in Automotive Systems Engineering** *Testers of active safety functions at Volvo Car Corporation and Zenuity AB.*
- March 2017 **Continuous Management of Systems Engineering Artifacts in Automotive** *Developers, safety experts, and managers at Volvo Car Corporation.*

Industrial Projects

- 2018–2020 **Holistic Systems Engineering** *Development of new engineering methodologies for simulation and modeling of systems components. In collaboration with Systemite AB and Volvo Car Corporation, Gothenburg.*
- 2019–2020 **Consistent Modeling of Autonomous Driving Functions** *Support with meta-modeling, creation of consistency checks, and versioning strategies. In collaboration with Systemite AB and Zenuity AB, Gothenburg.*
- 2016–2018 **Requirements Engineering Processes and Tools for Function Specification** *Creating an aligned metamodel, processes, and tool solutions to specify functional requirements at multiple departments at Volvo Group Trucks Technology. Planning and conducting user trainings. In collaboration with Systemite AB and Volvo Group Trucks Technology, Gothenburg.*

Service

Conference Activities

- 2023 Student Research Competition Program Committee Co-Chair, SE'23
- 2022 Industry Track Program Committee Co-Chair, EASE'22
- 2022 Posters and Tool Demo Program Committee Co-Chair, RE'22
- 2022 Publication Co-Chair, ICSA'22
- 2022 Proceedings Chair, SEAMS'22
- 2021 Publicity & Social Media Chair, RE'21
- 2018 Student Volunteers Chair, SPLC'18
- 2017/2018 Student Volunteer, ICSE'18, ICSE'17, ICSA'17, and SPLC'17

Reviewing/Program Committee Membership

- since 2018 Reviewer for Communications of the ACM, Empirical Software Engineering Journal, Journal of Software: Evolution and Process, Journal of Systems & Software, IEEE Software, Information and Software Technology
- 2023 Program Committee Member, ICSA'23
- 2023 Program Committee Member, RE'23
- 2023 Program Committee Member, ICSE-SEIP'23
- 2023 Program Committee Member, SE'23 (German software engineering conference)
- 2022 Program Committee Member, ICSA'22
- 2022 Program Committee Member, ICGSE/ICSSP'22
- 2022 Program Committee Member, Automotive Software Engineering Workshop '22
- 2021 Program Committee Member, ICSA'21
- 2021 Program Committee Member, ICGSE/ICSSP'21
- 2021 Program Committee Member, RE@Next! track at RE'21
- 2021 Program Committee Member, Automotive Software Engineering Workshop '21
- 2021 Program Committee Member, Doctoral Symposium at ICGSE/ICSSP'21
- 2020 Program Committee Member, ICSSP'20
- 2019 Program Committee Member, ICSSP'19
- 2018 Subreviewer, REFSQ'18

Language Skills

German (native speaker), English (full professional proficiency),
Swedish (full professional proficiency), Spanish (advanced proficiency)

Overview of Publications

- Journals *6 articles, 5 of which as first author.*
- Conferences *17 peer-reviewed publications, 11 of which as first author. Including A*- and A-ranked conferences (ICSE, RE, ASE, SEAMS, ICSA, ...).*
- Under review *3 journal papers, 1 of which as first author.*
- Theses *1 Ph.D. thesis, 1 Licentiate thesis.*
- Collaborations *Co-authored publications with 31 colleagues from 11 universities and 7 companies in 8 countries.*

Journal Publications

- [1] R. Wohlrab and D. Garlan. A negotiation support system for defining utility functions for multi-stakeholder self-adaptive systems. *Requirements Engineering*, 2021.
- [2] R. Wohlrab, E. Knauss, and P. Pelliccione. Why and how to balance alignment and diversity of requirements engineering practices in automotive. *Journal of Systems and Software*, 162:110516, 2020. Invited presentation at RE'20 (journal-first paper).
- [3] R. Wohlrab, P. Pelliccione, A. Shahrokni, and E. Knauss. Why and how your traceability should evolve: Insights from an automotive supplier. *IEEE Software*, 2020.
- [4] S. Maro, J. Steghöfer, E. Knauss, J. Horkoff, R. Kasauli, R. Wohlrab, J. L. Korsgaard, F. Wartenberg, N. J. Strøm, and R. Alexandersson. Managing traceability information models: Not such a simple task after all? *IEEE Software*, 2020.
- [5] R. Wohlrab, P. Pelliccione, E. Knauss, and M. Larsson. Boundary objects and their use in agile systems engineering. *Journal of Software: Evolution and Process*, 31(5), 2019.
- [6] R. Wohlrab, E. Knauss, J.-P. Steghöfer, S. Maro, A. Anjorin, and P. Pelliccione. Collaborative traceability management: a multiple case study from the perspectives of organization, process, and culture. *Requirements Engineering*, 2020. Invited presentation at RE'19 (journal-first paper).

Peer-Reviewed Conference Papers

- [1] R. Wohlrab, R. Meira-Góes, and M. Vierhauser. Run-time adaptation of quality attributes for automated planning. In *Proceedings of the 17th Symposium on Software Engineering for Adaptive and Self-Managing Systems (SEAMS'22)*, 2022.
- [2] A. Bucaioni, P. Pelliccione, and R. Wohlrab. Aligning architecture with business goals in the automotive domain. In *IEEE International Conference on Software Architecture (ICSA 2021)*, 2021.
- [3] R. Wohlrab and D. Garlan. Defining utility functions for multi-stakeholder self-adaptive systems. In *27th International Working Conference on Requirement Engineering: Foundation for Software Quality*. Springer International, 2021.
- [4] R. Wohlrab, J. Horkoff, R. Kasauli, S. Maro, J.-P. Steghöfer, and E. Knauss. Modeling and analysis of boundary objects and methodological islands in large-scale systems development. In *Proceedings of the International Conference on Conceptual Modeling (ER'20)*, pages 575–589. Springer, 2020.
- [5] R. Kasauli, R. Wohlrab, E. Knauss, J.-P. Steghöfer, J. Horkoff, and S. Maro. Charting coordination needs in large-scale agile organisations with boundary objects and methodological islands. In *Proceedings of the International Conference on Software and System Processes (ICSSP'20)*, 2020.
- [6] R. Wohlrab, A. Anjorin, and A. S. Mishra. What do users expect of bidirectional transformations? In *Proceedings of the 16th European Conference on Modelling Foundations and Applications (ECMFA'20)*, volume 19, pages 4:1–19, 2020.
- [7] R. Wohlrab, U. Eliasson, P. Pelliccione, and R. Heldal. Improving the consistency and usefulness of architecture descriptions: Guidelines for architects. In *Proceedings of the IEEE International Conference on Software Architecture (ICSA'19)*, pages 151–160, March 2019. Best Paper Award.
- [8] R. Wohlrab, P. Pelliccione, E. Knauss, and R. Heldal. On interfaces to support agile architecting in automotive: An exploratory case study. In *Proceedings of the IEEE International Conference on Software Architecture (ICSA'19)*, pages 161–170, March 2019.

- [9] J.-P. Steghöfer, E. Knauss, J. Horkoff, and R. Wohlrab. Challenges of scaled agile for safety-critical systems. In *Proceedings of the 20th International Conference on Product-Focused Software Process Improvement (PROFES'19)*, 2019. Best Paper Award.
- [10] R. Wohlrab, P. Pelliccione, E. Knauss, and M. Larsson. Boundary objects in agile practices: Continuous management of systems engineering artifacts in the automotive domain. In *Proceedings of the International Conference on Software and System Process (ICSSP'18)*, pages 31–40. ACM, 2018. Best Paper Award.
- [11] S. García, C. Menghi, P. Pelliccione, T. Berger, and R. Wohlrab. An architecture for decentralized, collaborative, and autonomous robots. In *Proceedings of the IEEE International Conference on Software Architecture (ICSA'18)*, pages 75–84, 2018.
- [12] R. Wohlrab, P. Pelliccione, E. Knauss, and S. C. Gregory. The problem of consolidating RE practices at scale: An ethnographic study. In *Proceedings of the International Working Conference on Requirement Engineering: Foundation for Software Quality (REFSQ'18)*, pages 155–170. Springer International, 2018.
- [13] E. Knauss, G. Liebel, J. Horkoff, R. Wohlrab, R. Kasauli, F. Lange, and P. Gildert. T-Reqs: Tool support for managing requirements in large-scale agile system development. In *Proceedings of the 26th IEEE International Requirements Engineering Conference (RE'18)*, pages 502–503, 2018.
- [14] R. Wohlrab. Continuous management of design- and run-time artifacts for self-adaptive systems. In *Proceedings of the 39th International Conference on Software Engineering Companion (ICSE Doctoral Symposium 2017)*, pages 473–474, 2017.
- [15] S. Maro, A. Anjorin, R. Wohlrab, and J.-P. Steghöfer. Traceability maintenance: Factors and guidelines. In *Proceedings of the 31st IEEE/ACM International Conference on Automated Software Engineering (ASE'16)*, pages 414–425, 2016.
- [16] R. Wohlrab, J.-P. Steghöfer, E. Knauss, S. Maro, and A. Anjorin. Collaborative traceability management: Challenges and opportunities. In *Proceedings of the 24th IEEE International Requirements Engineering Conference (RE'16)*, pages 216–225, 2016.
- [17] R. Wohlrab, T. de Gooijer, A. Koziolk, and S. Becker. Experience of pragmatically combining RE methods for performance requirements in industry. In *Proceedings of the 22nd IEEE International Requirements Engineering Conference (RE'14)*, pages 344–353, 2014.

Under Review

- [1] J. Cámara, R. Wohlrab, D. Garlan, and B. Schmerl. ExTrA: Explaining architectural design tradeoff spaces via dimensionality reduction. *Under review at the Journal of Systems and Software*, 2022.
- [2] R. Wohlrab, J. Cámara, D. Garlan, and B. Schmerl. Explaining quality attribute tradeoffs in automated planning for self-adaptive systems. *Under review at the Journal of Systems and Software*, 2022.
- [3] M. Vierhauser, R. Wohlrab, M. Stadler, and J. Cleland-Huang. AMon: : A Domain-Specific Language and Framework for Adaptive Monitoring of Cyber-Physical Systems. *Under review at the Journal of Systems and Software*, 2022.

Theses

- [T-1] R. Wohlrab. *Continuous Management of Artifacts and Traceability in Large-Scale Agile Systems Engineering*. Licentiate thesis, Chalmers University of Technology, 2018.
- [T-2] R. Wohlrab. *Living Boundary Objects to Support Agile Inter-Team Coordination at Scale*. PhD thesis, Chalmers University of Technology, 2020.