

Sebastian Wolff

Curriculum Vitae

Courant Institute of Mathematical Sciences

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🌐 [wolff09.github.io](https://github.com/wolff09)

🔑 HM9-yL4AAAAJ

Education

- since July 2021 **Junior Fellow of the Simons Foundation and Post-doctoral Researcher**, *Analysis of Computer Systems Group, Courant Institute of Mathematical Sciences, New York University, USA*
Working with: Prof. Dr. Thomas Wies, Prof. Dr. Dennis Shasha
- 2017–2021 **Ph.D. Student, Research and Teaching Assistant**, *Institute of Theoretical Computer Science, Technische Universität Braunschweig, Germany*, graduated with distinction (*summa cum laude*)
Supervisor: Prof. Dr. Roland Meyer
Thesis: *Verifying Non-blocking Data Structures with Manual Memory Management*
Committee: Prof. Dr. Roland Meyer, Prof. Dr. Rupak Majumdar, Prof. Dr. Constantin Enea
ETAPS 2022 Doctoral Dissertation Award
- 2015–2017 **Ph.D. Student**, *Concurrency Theory Group, Technische Universität Kaiserslautern, Germany* and *Competence Center High-Performance Computing, Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, Germany*
Supervisors: Prof. Dr. Roland Meyer, Dr. Mirko Rahn
- 2009–2015 **M.Sc. and B.Sc. in Computer Science**, minor in Math, *Technische Universität Kaiserslautern, Germany*

Awards & Fellowships

- 2020 **Simons Junior Fellowship**
Individual research award from the Simons Foundation, New York, USA.
Budget: \$433,124.00 for 3 years (grant number: 855328).
- 2022 **ETAPS Doctoral Dissertation Award**
- 2015 **Ph.D. Scholarship**
Fully-funded Ph.D. scholarship from the Fraunhofer Institute for Industrial Mathematics ITWM, Kaiserslautern, Germany.

Community Service

Reviewer

conferences POPL'24, TACAS'24, VMCAI'24, PLDI'22, CONCUR'21, ESOP'20, FSTTCS'20, Petri Nets 2020, APLAS'19, ESOP'19, FORTE'19, NETYS'19, TACAS'19, CONCUR'18, FoSSaCS'18, ATVA'17, CONCUR'17, MFCS'17, NETYS'16, TACAS'16

journals Acta Informatica; Computing; Concurrency and Computation: Practice and Experience (CCPE); Science of Computer Programming (SCP)

Artifact Evaluation

chair VMCAI'24, ESOP'23
committee VMCAI'22, POPL'21, ATVA'19

Award Committee

ETAPS 2023 Doctoral Dissertation Award Committee

Publication List

- under review Roland Meyer, Thomas Wies, and [Sebastian Wolff](#). *Context-Aware Separation Logic*.
- under review Roland Meyer, Jakob Tepe, and [Sebastian Wolff](#). *Realizability in Semantics-Guided Synthesis Done Eagerly*.
- CAV'23** Roland Meyer, Anton Opaterny, Thomas Wies, and [Sebastian Wolff](#). *nekon: A Linearizability Proof Checker*. In CAV, volume 13964 of LNCS. Springer, 2023. doi : 10.1007/978-3-031-37706-8_9.
Artifact available and evaluated functional.
- PLDI'23** Roland Meyer, Thomas Wies, and [Sebastian Wolff](#). *Embedding Hindsight Reasoning in Separation Logic*. PACMPL, volume 7(PLDI), 2023. doi : 10.1145/3591296.
Artifact available and evaluated functional&reusable.
- TACAS'23** Roland Meyer, Thomas Wies, and [Sebastian Wolff](#). *Make flows small again: revisiting the flow framework*. In TACAS, volume 13993 of LNCS. Springer, 2023. doi : 10.1007/978-3-031-30823-9_32.
Artifact available and evaluated functional&reusable.
- OOPSLA'22** Roland Meyer, Thomas Wies, and [Sebastian Wolff](#). *A concurrent program logic with a future and history*. PACMPL, volume 6(OOPSLA), 2022. doi : 10.1145/3563337.
Artifact available and evaluated functional&reusable.
- APLAS'22** Mike Becker, Roland Meyer, Tobias Runge, Ina Schaefer, Sören van der Wall, and [Sebastian Wolff](#). *Model-Based Fault Classification for Automotive Software*. In APLAS, volume 13658 of LNCS. Springer, 2022. doi : 10.1007/978-3-031-21037-2_6.
- Ph.D. Thesis [Sebastian Wolff](#). *Verifying Non-blocking Data Structures with Manual Memory Management*. Ph.D. Thesis. TU Braunschweig, 2021. doi : 10.24355/dbbs.084-202108191157-0.
- POPL'20** Roland Meyer and [Sebastian Wolff](#). *Pointer life cycle types for lock-free data structures with memory reclamation*. PACMPL, volume 4(POPL), 2020. doi : 10.1145/3371136.
Artifact available and evaluated functional&reusable.
- POPL'19** Roland Meyer and [Sebastian Wolff](#). *Decoupling lock-free data structures from memory reclamation for static analysis*. PACMPL, volume 3(POPL), 2019. doi : 10.1145/3290371.
Artifact available and evaluated functional&reusable.
- Festschrift Roland Meyer and [Sebastian Wolff](#). *Reasoning about weak semantics via strong semantics*. In Principled Software Development. Springer, 2018. doi : 10.1007/978-3-319-98047-8_18.
- SAS'17** Lukás Holík, Roland Meyer, Tomáš Vojnar, and [Sebastian Wolff](#). *Effect summaries for thread-modular analysis — sound analysis despite an unsound heuristic*. In SAS, volume 10422 of LNCS. Springer, 2017. doi : 10.1007/978-3-319-66706-5_9.
- VMCAI'16** Frédéric Haziza, Lukás Holík, Roland Meyer, and [Sebastian Wolff](#). *Pointer race freedom*. In VMCAI, volume 9583 of LNCS. Springer, 2016. doi : 10.1007/978-3-662-49122-5_19.
- SKILL'15** [Sebastian Wolff](#). *Building A state-of-the-art model checker*. In GI-Jahrestagung, volume P-246 of LNI. GI, 2015. url : dl.gi.de/handle/20.500.12116/2168.

Experience

Industry Projects

- 2019 **Virtual Test Analyser**, *IAV automotive engineering*, Gifhorn, Germany
Topic: development of a static analysis tool for test case classification in the context of car control units

Invited Talks

- 2022 **ETAPS**, “Verifying Non-blocking Data Structures with Manual Memory Management”
(Presentation associated with dissertation award)
- 2020 **DCON**, *German Workshop on Concurrency Theory*, “Pointer life cycle types for lock-free data structures with memory reclamation”

2017 **Dagstuhl Seminar**, *New Challenges in Parallelism*, “Effect summaries for thread-modular analysis”

Teaching

2017 **Lecturer**, “*Program Analysis*”

Topics: program analysis, data flow analysis, operational semantics, abstract interpretation

2016-2020 **Programming Lab Supervisor**

Various topics, including: compiler construction, distributed computing, model checking of recursive programs, static analysis of weak memory systems

since 2016 **Thesis Supervisor**

- *Making Programs Memory Safe*, Jakob Tepe
- *Types for Verifying Memory Safety of RCU Programs*, Benjamin Hennies
- *Synthesizing the Interaction between Lock-Free Data Structures and Memory Reclamation Algorithms*, Thomas Graave
- *Compositional verification for Petri nets*, Janosch Reppnow
- *Symbolic Heaps for a Thread-Modular Linearizability Analysis*, Jakob Wenzel

Research Stays

July 2019 **New York University**, *Analysis of Computer Systems Group, Courant Institute of Mathematical Sciences, New York University, New York, USA*

Host: Prof. Dr. Thomas Wies

April 2016 **Aalto University**, *Department of Computer Science, Aalto University, Helsinki, Finland*

Host: Prof. Dr. Keijo Heljanko

Academic Software

plankton A proof-of-concept tool for automatically verifying linearizability of concurrent search structures. Implements the techniques from OOPSLA’22 and PLDI’23.

Repository: <https://github.com/Wolff09/plankton>

nektion A proof-of-concept tool for checking/validating (linearizability) proof outlines of concurrent search structures (with Anton Opaterny). Implements CAV’23.

Repository: <https://github.com/OpaAnton/plankton>

krill Implementation of the TACAS’23 fixed point computation for flow graphs.

Repository: <https://github.com/nyu-acsys/krill>

seal Implementation of the POPL’20 type system and instrumentation for automatically verifying concurrent data structures with manual memory management.

Repository: <https://github.com/Wolff09/seal>

TMRexp A proof-of-concept tool for automatically verifying linearizability of concurrent data structures with manual memory management. Implements POPL’19.

Repository: <https://github.com/Wolff09/TMRexp>