

Ralf Jung

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I am developing *formal foundations and tools* that are able to analyze and verify *real-world software systems*. To achieve this, my work spans all the way from foundational and deeply theoretical to applied, from proving theorems to developing tools used by other researchers and software developers.

Education

- PhD in Computer Science**, MPI-SWS and Saarland University (2013 – 2020)
Understanding and Evolving the Rust Programming Language
Advisor: Derek Dreyer
Distinction: summa cum laude
- Master in Computer Science**, MPI-SWS and Saarland University (2013 – 2019)
Higher-Order Ghost State
Advisor: Derek Dreyer
- Bachelor in Computer Science**, Saarland University (2010 – 2013)
An Intermediate Language to Formally Justify Memory Access Reordering
Advisor: Sebastian Hack

Academic Positions

- ETH Zurich**, Assistant Professor (2022 – present)
Department of Computer Science
- MIT**, Post-doctoral researcher (2021 – 2022)
Advisors: Frans Kaashoek and Nickolai Zeldovich (PDOS group at CSAIL)
- MPI-SWS**, Post-doctoral researcher (2020 – 2021)
Advisor: Derek Dreyer

Other Experience

- Mozilla Research: Internship and research assistantship (2017, 2018)
- Saarland University: Research assistant (2014)

Awards and Fellowships

- Alonzo Church Award* at ICALP (2023)
for the design and implementation of Iris
- Distinguished Paper Award* at POPL (2022)
for Simuliris: a separation logic framework for verifying concurrent program optimizations
- Honorable Mention for the *ACM Doctoral Dissertation Award* (2021)
- Recipient of *SIGPLAN John C. Reynolds Doctoral Dissertation Award* (2021)
- Recipient of *ETAPS Doctoral Dissertation Award* (2021)
- Recipient of *Otto Hahn Medal* of the Max-Planck Society for my dissertation (2021)
- Recipient of Saarland University's Dr. Eduard Martin prize for my dissertation (2021)
- Saarland University nominee for GI dissertation award (2021)
- Scholar of German National Academic Foundation (Studienstiftung des Deutschen Volkes) (2013)
- FdSI Bachelor Award of Summer 2013 for an outstanding Bachelor's thesis (2013)

Scientific Talks

- Miri: Practical Undefined Behavior Detection for Rust*
Keynote at ICOOLPS workshop on language implementation and optimization (upcoming) (2024)
Panelist for discussion on Rust contract languages at Rust Verification Workshop (2024)
- Less is More: A Brief Retrospective on Iris*
Alonzo Church Award lecture at ICALP (2023)
- An Introduction to Iris*
Seminar talk at CMU verification seminar (2023)
Guest lecture at Universidade de Lisboa (2021)
- Functional correctness specifications for concurrent data structures: Logical Atomicity in Iris*
Keynote at Advances in Separation Logics workshop (2022)
- Separation is all you need*
Seminar talk at Microsoft Research (2022)
Seminar talk at Newton Institute (2022)
- PLMW panelist* at POPL (2022)
- Ask-me-anything session on Rust* at ICFP (2021)
- RustBelt: A Quick Dive Into the Abyss*
Seminar talk at Boston University (2021)
Seminar talk at University of Wisconsin–Madison (2021)
Invited talk at Rust Verification Workshop (2021)
- Iris—A Modular Foundation for Higher-Order Concurrent Separation Logic*
Tutorial at POPL (2021)
- Stacked Borrows: An Aliasing Model for Rust*
Invited talk at PRiML workshop on Programming Research in Mainstream Languages (2020)
Conference talk at POPL (2020)
Seminar talk at University of Cambridge (2019)
- Logical Atomicity in Iris: The Good, the Bad, and the Ugly*
Invited talk at the Iris Workshop (2019)
- Understanding and Evolving the Rust Programming Language*
Seminar talk at MIT (2019)
Seminar talk at Northeastern University (2019)
Seminar talk at University of Pennsylvania (2019)
Seminar talk at Cornell University (2019)
- RustBelt: Securing the Foundations of the Rust Programming Language*
Conference talk at POPL (2018)
Workshop talk at CSL Automation Workshop by Facebook (2017)
- The Lifetime Logic – A logic for Rust-style borrowing*
Seminar talk at Aarhus University (2016)
- Higher-Order Ghost State*
Conference talk at ICFP (2016)
- Unifying Worlds And Resources*
Seminar talk at Aarhus University (2015)
Workshop talk at HOPE (2015)
- Iris: Monoids and Invariants as an Orthogonal Basis for Concurrent Reasoning*
Seminar talk at Birmingham University (2015)
Conference talk at POPL (2015)

Service

Member of PhD thesis committee for Jules Jacobs, Federico Poli, Xavier Denis.

Program committee (PC) member of ITP 2024, CoqPL 2024, POPL 2023, ETAPS doctoral dissertation award 2022, PLDI 2022, OOPSLA 2022, CPP 2022, ICFP 2021, Coq Workshop 2021, IWACO 2020.

Student research competition (SRC) committee member of POPL 2024, SPLASH 2023.

Reviewer for OOPSLA 2023, PLDI 2023, ICFP 2022, ICFP 2019, ESOP 2019, OOPSLA 2018, ITP 2018, POPL 2017, ESOP 2015, as well as the following journals: LMCS (2023, 2022), CONCUR (2023), JFP (2020, 2015), and TOPLAS (2015).

Artifact evaluation committee (AEC) member of CAV 2017, POPL 2017.

Supervision and Mentoring

Research Group at ETH

Johannes Hostert, PhD candidate	(Fall 2023)
Rudy Peterson, direct doctorate student	(Fall 2023)
Isaac van Bakel, PhD candidate	(Spring 2023)
Max Vistrup, PhD candidate	(Spring 2023)

Outside ETH

Neven Villani, undergraduate intern (MPI-SWS)	(2023 – present)
Zixian Cai (SIGPLAN long-term mentoring)	(2020 – 2023)
Yun-Sheng Chang, graduate student (MIT)	(2021 – 2022)
Upamanyu Sharma, graduate student (MIT)	(2020 – 2022)
Michael Sammler, graduate student (MPI-SWS)	(2019)
George Pirlea, graduate intern (MPI-SWS)	(2019)
Marianna Rapoport, graduate intern (MPI-SWS)	(2018)

Teaching

Taught courses

Formal Foundations of Programming Languages (263-2520-00L, 5 KP) 35 students, general satisfaction score: 4.3 (out of 5)	(2023)
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Completed teaching training courses

“Teaching at ETH 1: Committed and skilled” course offered by LET	(2023 – 2024)
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Outreach

- [Podcast] Ralf Jung on GhostCell and Working as a PL Researcher. *Building with Rust*, June 2021. <https://anchor.fm/building-with-rust/episodes/Building-with-Rust-el2auje>
- My research blog serves as an opportunity to describe my research to a wider audience and engage in discussions beyond the research community. URL: <https://ralfj.de/blog/categories/research.html>

Selected Free Software Contributions

Numerous contributions to the Rust language and compiler (2017 – present)
Co-lead of the operational semantics team, advisor to the language team, maintainer of Miri (<https://github.com/rust-lang/miri>), compiler contributor (rank according to GitHub:¹ #3)

¹<https://github.com/rust-lang/rust/graphs/contributors> as of 2024-05-29, excluding bots

One of two lead developers of Iris, a program logic with an interactive proof mode in Coq (2014 – present)
(<https://iris-project.org/>)

Sysadmin and developer of the Freifunk mesh WiFi community in Saarland, Germany (2016 – 2023)
(<https://saar.freifunk.net>)

For a more complete list, see my website at ralfj.de/projects and my GitHub profile at github.com/RalfJung.