

Ralf Jung

Academic Background

MPI-SWS and Saarland University

PhD in Computer Science, distinction: summa cum laude (2020)

Master in Computer Science, grade A (1.0) (2019)

Saarland University

Bachelor in Computer Science, grade A (1.0) (2013)

Research Experience

MIT

Post-doctoral research (2021 – present)

Advisors: Frans Kaashoek and Nickolai Zeldovich (PDOS group at CSAIL)

MPI-SWS

Post-doctoral research (2020 – 2021)

Advisor: Derek Dreyer

Doctoral research (2014 – 2020)

Thesis Title: *Understanding and Evolving the Rust Programming Language*

Advisor: Derek Dreyer

Reviewers: Viktor Vafeiadis, François Pottier

Completion: August 2020, distinction: summa cum laude

Mozilla Research

Internship, research assistantship (2017, 2018)

Mozilla offices: Portland, Berlin

Worked with the Rust team in two summer projects on a better specification and tooling for unsafe code in Rust.

Saarland University

Research assistant (2014)

Research groups: computer graphics (led by Philipp Slusallek), compiler construction (led by Sebastian Hack)

Implemented a raytracer in an experimental programming language (AnyDSL) geared towards partial evaluation.

Bachelor thesis research project (2012 – 2013)

Title: *An Intermediate Language to Formally Justify Memory Access Reordering*

Advisor: Sebastian Hack

Completion: March 2013, grade A (1.0)

Awards, Honours and Scholarships

Recipient of SIGPLAN John C. Reynolds Doctoral Dissertation Award (2021)

Honorable Mention for the ACM Doctoral Dissertation Award (2021)

Recipient of Otto Hahn Medal of the Max-Planck Society (2021)

Recipient of ETAPS Doctoral Dissertation Award (2021)

Selected as Saarland University nominee for GI dissertation award	(2021)
Selected participant for 6th Heidelberg Laureate Forum	(2018)
Final admission into Studienstiftung des Deutschen Volkes	(2013)
FdSI Bachelor Award of Summer 2013 for an outstanding Bachelor's thesis	(2013)
Preliminary admission into Studienstiftung des Deutschen Volkes	(2012)
Member of the Saarland University computer science honours program for bachelor students	(2011 – 2013)
Recipient of the “Deutschlandstipendium” Scholarship	(2011 – 2012)

Professional Activities

Program committee (PC) member

- ACM SIGPLAN Conference on Programming Language Design and Implementation (**PLDI 2022**).
- ACM SIGPLAN International Conference on Object-oriented Programming, Systems, Languages, and Applications (**OOPSLA 2022**).
- Certified Programs and Proofs (**CPP 2021**).
- ACM SIGPLAN International Conference on Functional Programming (**ICFP 2021**).
- **Coq Workshop 2021**.
- International Workshop on Aliasing, Capabilities and Ownership (**IWACO 2020**).

External review committee (ERC) member

- ACM SIGPLAN International Conference on Functional Programming (**ICFP 2019**).

Artifact evaluation committee (AEC) member

- International Conference on Computer Aided Verification (**CAV 2017**).
- ACM SIGPLAN Symposium on Principles of Programming Languages (**POPL 2017**).

Selected Talks

- Invited talk *RustBelt: A Quick Dive Into the Abyss* with Michael Sammler at Rust Verification Workshop 2021.
- Invited talk *Stacked Borrows: An Aliasing Model for Rust* at Workshop on Programming Research in Mainstream Languages (PRiML 2020).
- Invited talk *Logical Atomicity in Iris: The Good, the Bad, and the Ugly* at Iris Workshop 2019.
- Seminar talk *Understanding and evolving the Rust programming language* at Cornell University, University of Pennsylvania, Northeastern University, and MIT (2019).
- Seminar talk *Stacked Borrows: An Aliasing Model for Rust* at University of Cambridge (2019).
- Workshop talk *Rust(Belt)* at CSL Automation Workshop by Facebook, London (2017).
- Seminar talk *The Lifetime Logic – A logic for Rust-style borrowing* at **Aarhus University** (2016).
- Seminar talk *Unifying Worlds And Resources* at **Aarhus University** (2015).
- Invited talk *Iris: Monoids and Invariants as an Orthogonal Basis for Concurrent Reasoning* at **Birmingham University** (2015).

- Workshop talk *Unifying Worlds And Resources* at **HOPE 2015**.

Invited Participant of **Dagstuhl Seminar** on *Compositional Verification Methods for Next-Generation Concurrency* (2015).

Attendee of **OPLSS 2014** and **DeepSpec workshop 2016**.

Reviewer for **JFP**.

Subreviewer for **ESOP 2019**, **OOPSLA 2018**, **ITP 2018**, **POPL 2017**, **ESOP 2015**, and **JFP**.

Active Member of the **Rust Unsafe Code Guidelines Working Group**, and external advisor to the **Rust language team**.

Publications

- Joshua Yanovski, Hoang-Hai Dang, **Ralf Jung**, and Derek Dreyer. “GhostCell: Separating permissions from data in rust”. In: *PACMPL 2.ICFP* (2021).
- Tej Chajed, Joseph Tassarotti, Mark Theng, **Ralf Jung**, M. Frans Kaashoek, and Nickolai Zeldovich. “Gojournal: A verified, concurrent, crash-safe journaling system”. In: *OSDI*. USENIX Association, 2021.
- **Ralf Jung**, Jacques-Henri Jourdan, Robbert Krebbers, and Derek Dreyer. “Safe systems programming in Rust: The promise and the challenge”. In: *CACM* (To appear, 2021).
- **Ralf Jung**, Hoang-Hai Dang, Jeehoon Kang, and Derek Dreyer. “Stacked Borrows: An aliasing model for Rust”. In: *PACMPL 4.POPL* (2020).
- **Ralf Jung**, Rodolphe Lepigre, Gaurav Parthasarathy, Marianna Rapoport, Amin Timany, Derek Dreyer, and Bart Jacobs. “The future is ours: Prophecy variables in separation logic”. In: *PACMPL 4.POPL* (2020).
- **Ralf Jung**, Robbert Krebbers, Jacques-Henri Jourdan, Aleš Bizjak, Lars Birkedal, and Derek Dreyer. “Iris from the ground up: A modular foundation for higher-order concurrent separation logic”. In: *Journal of Functional Programming* 28 (2018).
- Juneyoung Lee, Chung-Kil Hur, **Ralf Jung**, Zhengyang Liu, John Regehr, and Nuno P. Lopes. “Reconciling high-level optimizations and low-level code in LLVM”. in: *PACMPL 2.OOPSLA* (Oct. 2018).
- Robbert Krebbers, Jacques-Henri Jourdan, **Ralf Jung**, Joseph Tassarotti, Jan-Oliver Kaiser, Amin Timany, Arthur Charguéraud, and Derek Dreyer. “MoSeL: A general, extensible modal framework for interactive proofs in separation logic”. In: *PACMPL 2.ICFP* (2018).
- **Ralf Jung**, Jacques-Henri Jourdan, Robbert Krebbers, and Derek Dreyer. “RustBelt: Securing the foundations of the Rust programming language”. In: *PACMPL 2.POPL* (2018).
- Robbert Krebbers, **Ralf Jung**, Aleš Bizjak, Jacques-Henri Jourdan, Derek Dreyer, and Lars Birkedal. “The essence of higher-order concurrent separation logic”. In: *ESOP*. vol. 10201. LNCS. 2017.
- Joseph Tassarotti, **Ralf Jung**, and Robert Harper. “A higher-order logic for concurrent termination-preserving refinement”. In: *ESOP*. vol. 10201. LNCS. 2017.
- **Ralf Jung**, Robbert Krebbers, Lars Birkedal, and Derek Dreyer. “Higher-order ghost state”. In: *ICFP*. 2016.
- **Ralf Jung**, David Swasey, Filip Sieczkowski, Kasper Svendsen, Aaron Turon, Lars Birkedal, and Derek Dreyer. “Iris: Monoids and invariants as an orthogonal basis for concurrent reasoning”. In: *POPL*. 2015.

Theses

- **Ralf Jung**. “Understanding and evolving the Rust programming language”. PhD Thesis. 2020.
- **Ralf Jung**. “Higher-order ghost state”. Master’s Thesis. 2019.
- **Ralf Jung**. “An intermediate language to formally justify memory access reordering”. Bachelor’s Thesis. 2013.

Teaching Experience

MPI-SWS

- Internship mentor** (2018)
Advised Marianna Rapoport (PhD student at University of Waterloo) on a project to encode prophecy variables into Iris.
- Rust course instructor** (2015)
Designed and instructed a Rust tutorial running weekly for about two months.

Saarland University

- Teaching assistant and recitation instructor** (2015 – 2016)
Undergraduate and graduate course: *Semantics*
Lecturers: Gert Smolka, Derek Dreyer
Led an exercise group, helped students in office hours, designed and graded weekly tests, designed weekly homework, designed and graded exam.
- Recitation instructor** (2013)
Undergraduate and graduate course: *Introduction to Computational Logic*
Lecturer: Gert Smolka
Led an exercise group, helped students in office hours, graded weekly tests and exam.
- Recitation instructor** (2011 – 2012)
Undergraduate course: *Programmierung 1* (“Programming 1”)
Lecturer: Holger Hermanns
Led an exercise group, helped students in office hours, graded weekly tests and exam.
- Recitation instructor** (2010 – 2011)
Undergraduate course: *Programmierung 2* (“Programming 2”)
Lecturer: Sebastian Hack
Led an exercise group, helped students in office hours, graded exam.

Language skills

- German: mother tongue
- English: fluent (Cambridge University “First Certificate in English”, 2006)

Selected Free Software Contributions

- Sysadmin and developer of the Freifunk community in Saarland, Germany (2016 – present)
- Contributor to the Rust compiler and language development (2015 – present)
- One of now three lead developers of Iris, a program logic with an interactive proof mode in Coq that is released as open-source software (2014 – present)
- Contributor to the KDE window manager and some KDE libraries (2012 – 2013)

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