

Fabian Ritter

Campus E1 3, Rm. 403, 66123 Saarbrücken, Germany
fabian.ritter@cs.uni-saarland.de

EDUCATION

- SINCE 2017 | **PhD student** in the INTERNATIONAL MAX PLANCK RESEARCH SCHOOL for Computer Science, at the COMPILER DESIGN LAB at SAARLAND UNIVERSITY
- 2016 – 2017 | **Doctoral Preparatory Phase** at SAARBRÜCKEN GRADUATE SCHOOL OF COMPUTER SCIENCE, SAARLAND UNIVERSITY
- 2012 – 2015 | **Bachelor of Science** in Computer Science with minor in Mathematics, SAARLAND UNIVERSITY
- 2004 – 2012 | **Abitur** at LEIBNIZ GYMNASIUM, St. Ingbert

SCHOLARSHIPS AND CERTIFICATES

- SINCE 2017 | Fellow of the INTERNATIONAL MAX PLANCK RESEARCH SCHOOL for Computer Science
- 2016 – 2017 | Scholarship holder of SAARBRÜCKEN GRADUATE SCHOOL OF COMPUTER SCIENCE, SAARLAND UNIVERSITY
- 2013 – 2015 | Member of BACHELOR FÖRDERPROGRAMM, SAARLAND UNIVERSITY

ACADEMIC ACTIVITIES

- 2017 – 2018 | Lecturer's assistant at SAARLAND UNIVERSITY for the lecture Compiler Construction
- 2014 – 2017 | Tutor/Teaching assistant at SAARLAND UNIVERSITY for the lectures:
▷ Compiler Construction
▷ Nebenläufige Programmierung (concurrent programming)
▷ Grundzüge der Theoretischen Informatik (theoretical computer science)
▷ Systemarchitektur (system architecture)

SKILLS

- LANGUAGE | ▷ German: native
▷ English: fluent
- TECHNICAL | ▷ C/C++: experienced, used in research projects, course work, private projects, especially using the LLVM compiler framework
▷ SCALA, PYTHON: used in research projects and private projects
▷ JAVA, C#, VERILOG: used in course work
▷ L^AT_EX: used for writing academic documents, designing slides and posters

RESEARCH PROJECTS

- 2017 | **Memory Safety in C** (current research)
- ▷ Understanding memory-safety-induced vulnerabilities as a problem of the programming language definition (rather than an eternal sequence of attacks and counter-measures)
 - ▷ Exploring ways of making C a “safe” programming language
- 2016 | **Supporting Transcendental Functions in Daisy, a Sound Verification Tool for the Precision of Floating-Point Computations**
(Research Immersion Lab, AUTOMATED VERIFICATION AND APPROXIMATION group, MAX PLANCK INSTITUTE FOR SOFTWARE SYSTEMS)
- ▷ Extended Daisy for soundly estimating round-off errors caused by using floating-point operations for trigonometric and exponential functions
 - ▷ Developed algorithms for obtaining sound rational bounds for real-valued results of transcendental functions
- 2016 | **Memory Safety Analysis in Sprattus**
(Research Immersion Lab, REAL-TIME AND EMBEDDED SYSTEMS LAB, SAARLAND UNIVERSITY)
- ▷ Implemented analysis domains for obtaining information about accessed memory ranges and allocated memory regions in our symbolic abstraction framework
 - ▷ Designed a structured memory model for LLVM bitcode for use in symbolic abstraction
 - ▷ Evaluated on benchmarks from the Software Verification Competition 2016 with promising results
- 2015 | **Compiler Optimizations using Symbolic Abstraction**
(Bachelor’s Thesis, COMPILER DESIGN LAB, SAARLAND UNIVERSITY)
- ▷ Extended a framework for static analysis of LLVM bitcode by symbolic abstraction
 - ▷ Implemented classical compiler transformations in the clang compiler based on the found analysis results
 - ▷ Investigated how combining these analyses influences transformation quality