DOMINIK KLUMPP

PERSONAL INFORMATION

Born in São Paulo, Brazil, 1994

nationality German, Brazilian

email dominik.klumpp@lix.polytechnique.fr

website dominik-klumpp.net

EDUCATION

2019–2025 University of Freiburg

PhD studies (Dr. rer. nat) Computer Science

PhD research at the chair for Software Engineering, centered around automatic program verification, in particular for concurrent programs. Worked as a lecturer and teaching assistant for several lectures at the Chair of Software Engineering. Supervised 20 student projects, B.Sc. and M.Sc. theses.

Thesis: *From Commutativity to Proofs and Back Again: Reduction and Verification of Concurrent Programs*
My thesis investigates the effect of *commutativity reasoning* (and *partial order reduction techniques*) on simplifying and speeding up the fully-automated, algorithmic verification of concurrent programs over infinite data types. I implemented the verification algorithms arising from my theoretical results in Ultimate GemCutter, a state-of-the-art algorithmic verification tool for concurrent C programs.

Final grade: 0 (*with distinction / summa cum laude*)
Advisor: Prof. Andreas Podelski

2016–2018 University of Augsburg, TU Munich, LMU Munich

M.Sc. Software Engineering

Elite Graduate Program *Software Engineering* by the University of Augsburg, the Technical University of Munich and the Ludwig-Maximilians-University Munich. The program is centered around the five subject areas *Software Engineering*, *Formal Methods*, *Distributed Systems*, *Databases* and *Human-Computer Interaction*. My personal focus was on the first two of these topics, especially on *Formal Methods*.

Thesis: *Automated Control Flow Reconstruction from Assembler Programs*
The research for my master thesis was conducted at and in cooperation with Macquarie University, Sydney. I adapted the automated verification technique *trace abstraction refinement* in order to build provably sound and precise control flow graphs for assembler programs with indirect branches.

Final grade: 1.0 [**grading scheme:** 1.0 (best) – 5.0 (failed)]
Advisor: Prof. Wolfgang Reif
Supervisors: Prof. Franck Cassez (Macquarie University), Dr. Gerhard Schellhorn

2013–2016 University of Augsburg

B.Sc. Computer Science

Thesis: *Optimising Runtime Safety Analysis Efficiency for Self-Organising Systems*
I wrote my bachelor thesis at the *Institute for Software and Systems Engineering* at the University of Augsburg. A short version of the thesis was published at the *QA4SASO* workshop on the *FAS* 2016* conference in Augsburg.

Final grade: 1.3 [**grading scheme:** 1.0 (best) – 5.0 (failed)]
Advisor: Prof. Wolfgang Reif
Supervisors: Dr. Axel Habermeier, Dr. Benedikt Eberhardinger, Dr. Hella Seebach

WORK EXPERIENCE

PostDoc

since 06/2025 PostDoc Researcher at Laboratoire d'Informatique (LIX), CNRS – École Polytechnique, France

Research on automated and deductive verification of concurrent programs.

Researcher / PhD candidate

2019 - 2025 Researcher & PhD candidate at the Chair for Software Engineering, University of Freiburg

Research on automatic verification with a focus on concurrent programs.

Lecturer for the lecture *Program Verification* in the summer semester 2024.

Co-organised several lectures offered by the Software Engineering group, in particular *Program Verification*, *Cyber-Physical Systems: Discrete Models* and *Theoretical Computer Science*. This involved designing weekly exercise sheets, coordinating student tutors, marking students' submissions, teaching a weekly exercise session, occasionally substituting for the lecturer, as well as designing, administering and marking the final exam.

Supervised students in several seminars offered by the Software Engineering group, in particular *Automata Theory* and *Program Analysis*.

Supervised 20 B.Sc. and M.Sc. theses and projects.

Student Research Assistant

2016–2018 Student Research Assistant at the Institute for Software and Systems Engineering, University of Augsburg

Research on safety analysis and on quality assurance for self-organizing systems. Contributed to the development of the *S#* modeling, safety analysis and simulation framework. Modeled and analyzed multiple case studies of self-organizing systems. Co-authored 3 scientific publications.

Zuehlke

Summer 2017 Internship, Zuehlke Engineering AG — Munich

Developed an Angular web application with a dockerized microservice backend based on Java and Spring Boot. Interfaced with several project and development management tools to display project status information.

Tutor: Theoretical Computer Science

2015–2017 Tutor at the Chair for Theoretical Computer Science, University of Augsburg

Worked on the lecture *Introduction to Theoretical Computer Science* in the summer semesters 2015, 2016 and 2017. This involved teaching a weekly exercise class, marking students' homework and assisting in supervision and marking of the exam.

Tutor: Discrete Structures

2015–2016 Tutor at the Chair for Programming Methodology and Multimedia Information Systems, University of Augsburg

Worked on the lecture *Discrete Structures for Computer Scientists* in the winter semesters 2015 and 2016. This involved teaching a weekly exercise class, marking students' homework and assisting in supervision and marking of the exam.

itestra

Summer 2015 itestra CodingCamp internship, itestra — Munich

Developed a prototype for a Windows mobile app with a Java backend.

ACADEMIC SERVICE

Reviewer

PLDI'26	Review Comittee member
SPIN'25	Program Comittee member
OOPSLA	External Reviewer ('22 & '23)
SV-COMP	Program Comittee member ('21-'26) Jury member for Ultimate Kojak ('21) Jury member for Ultimate GemCutter ('22 - '26)

Organiser

AVM'24 Co-organised the 16th Alpine Verification Meeting (AVM'24), 4th - 6th September 2024 in Freiburg; a workshop with 67 participants. avm2024.informatik.uni-freiburg.de

INVITED TALKS & RESEARCH VISITS

Rabat, Morocco

May 2025 **Workshop on Verification of Distributed Systems (VDS 2025)**

3-day invitation-only workshop, colocated with the NETYS conference.

Talk: Finding Commutativity for Algorithmic Verification of Concurrent Programs

Kaiserslautern, Germany

Mar 2025 **Visit at Max-Planck-Institute for Software Systems**

Seminar talk and discussions about possible collaborations.

Talk: How Commutativity Simplifies Proofs of Concurrent Programs

Paris, France

Feb 2025 **Visit at Université Paris Cité (IRIF) and École Polytechnique (LIX)**

Seminar talk and discussions about possible collaborations.

Talk: How Commutativity Simplifies Proofs of Concurrent Programs

Vienna, Austria

May 2024 **Visit at IST Austria**

Seminar talk and discussions about possible collaborations.

Talk: How Commutativity Simplifies Proofs of Concurrent Programs

Uppsala, Sweden

Feb 2024 **Visit at Uppsala Universitet**

Collaboration on a joint project.

Toronto, Canada

Jun 2022 **Visit at University of Toronto**

Seminar talk and collaboration on a joint paper.

Talk: Sound Sequentialization for Concurrent Program Verification

Sydney, Australia

Apr-Oct 2018 **Visiting researcher at Macquarie University**

6-month research stay for Master thesis research.

AWARDS

University of Freiburg

SUMMER SEMESTER 2024 **Teaching Award** of the Faculty of Engineering for the best lecture in Computer Science (*Cyber-Physical Systems II: Program Verification*)

SV-COMP 2025

ULTIMATE GEMCUTTER **3rd place** in *ConcurrencySafety* category (lead developer)

ULTIMATE AUTOMIZER **1st place** in *Overall* ranking (co-developer)

SV-COMP 2024

ULTIMATE GEMCUTTER **2nd place** in *ConcurrencySafety* category (lead developer)

ULTIMATE AUTOMIZER **1st place** in *Overall* ranking (co-developer)

SV-COMP 2023

ULTIMATE GEMCUTTER **3rd place** in *ConcurrencySafety* category (lead developer)

ULTIMATE AUTOMIZER **1st place** in *Overall* ranking (co-developer)

SV-COMP 2022

ULTIMATE GEMCUTTER **1st place** in *NoDataRace* demo category
3rd place in *ConcurrencySafety* category (lead developer)

OTHER INFORMATION

Languages

German	First language
English	Fluent, written and spoken
French	DELF B1
Chinese	YCT I, HSK II

Summer Schools

2023 41st Summer School Marktoberdorf on Safety and Security through Formal Verification, Marktoberdorf, Germany
events.model.in.tum.de/mod23/

2020 14th Summer School on Modelling and Verification of Parallel Processes (MOVEP), virtual
projects-verimag.imag.fr/movep2020/

2019 VMCAI Winter School, Lisbon, Portugal
vmcaischool19.tecnico.ulisboa.pt

Exchange Programs

China 2013	Chinese Bridge summer camp Confucius Institute
China 2010	Student Exchange High School of Beijing University
France	Student Exchanges 2007/2008, 2009/2010 and 2010/2011

26th November 2025