

## RESEARCH EXPERIENCE

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- **RWTH Aachen University**  Aachen, Germany  
PhD Student: Research and Teaching Assistant *Oct 2022 – Present*
  - **Research – Probabilistic Program Verification:** My PhD focuses on developing automated methods to analyze termination and expected runtime of probabilistic programs dealing with arbitrary data structures via probabilistic term rewrite systems.
  - **Teaching – Programming Languages and Verification:** Nominated for the student-voted teaching award for outstanding teaching assistants. Responsibilities included designing exercises, leading sessions, and assisting lectures.
- **RWTH Aachen University**  Aachen, Germany  
Student Assistant *Oct 2018 – Sep 2022*
  - **Assisted in Teaching and Research:** Research focussing on automated methods to analyze integer term rewrite systems, a formalism to express programs containing ordinary integer and arbitrary data structures, e.g., see here.

## EDUCATION

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- **PhD Student in Computer Science** Aachen, Germany  
RWTH Aachen University *Oct 2022 – Expected 2026*  
Thesis: “” (ongoing)
- **Master of Science in Computer Science** Aachen, Germany  
RWTH Aachen University; Grade: 1.2 (with distinction) *Oct 2020 – Oct 2022*  
Thesis: “*Using Dependency Pairs for Proving Almost-Sure Termination of Probabilistic Term Rewriting*”
- **Bachelor of Science in Computer Science** Aachen, Germany  
RWTH Aachen University; Grade: 1.4 *Oct 2017 – Oct 2020*  
Thesis: “*The Recursive Algorithm for Parity Games*”
- **Abitur (High School Graduation)** Soest, Germany  
Aldegrevener Gymnasium; Grade: 1.7 *Oct 2009 – Oct 2017*

## HONORS & REWARDS

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- **Teaching Assistant for B. Sc. Courses (Approx. 800 participants)** **Years**
  1. Programming Concepts (**Nominated for teaching award**) *(2022, 2023, 2024, 2025)*
- **Teaching Assistant for M. Sc. Courses (Approx. 300 participants)** **Years**
  1. Foundations of Functional Programming (**Nominated for teaching award**) *(2024, 2026)*
  2. Foundations of Logic Programming *(2025)*
- **Seminar Supervision (Supervised 1-30 students per seminar)** **Years**
  1. Advanced Programming Concepts *(2023, 2024, 2025, 2026)*
  2. Satisfiability Checking *(2025, 2026)*
  3. Verification Techniques *(2022, 2023, 2024, 2025)*
- **Student Assistant (During B. Sc. and M. Sc. )** **Years**
  1. Programming Concepts *(2018, 2019)*
  2. Complexity Theory *(2021)*
  3. Data Structures and Algorithms *(2019)*
  4. Formal Systems, Automata and Processes *(2018)*
  5. Mathematical Logic *(2021)*

## TEACHING EXPERIENCE

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- **PhD Student in Computer Science**  
RWTH Aachen University

Aachen, Germany  
Oct 2022 – Expected 2026

## STUDENT SUPERVISION

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- **M. Sc. Thesis Supervisor**

1. Leon Spitzer: “*Analyzing Strong Almost-Sure Termination for Probabilistic Term Rewriting Using Dependency Pairs*” ([related published paper](#))
2. Jiaqian Chen: “*Integration of New State-of-the-art SMT-Solvers into the Termination Tool AProVE*”

- **B. Sc. Thesis Supervisor**

1. Kiran Monteiro Pai: “*Reachability Analysis for Probabilistic Term Rewriting Systems*” ([related paper ongoing](#))
2. Tobias Sokolowski: “*Proving Confluence of Term Rewriting within AProVE*”
3. Arion Scheid: “*Using Stochastic Context Free Grammars to decide Almost Sure Termination for Probabilistic Term Rewriting Systems*” ([related paper ongoing](#))
4. Ivan Zlatin: “*Analyzing Derivational Complexity via Innermost Derivational Complexity*”
5. Alexander Schlecht: “*Counting the Probabilities of Loops: Disproving (Strong) Almost-Sure Termination of Probabilistic Rewriting Automatically*” ([related paper in review](#))
6. Henri Nagel: “*Refining the Dependency Framework for Basic Start Terms*”
7. David Weber: “*PReVision - A Visualization Tool for Computations of Probabilistic Term Rewriting*”
8. Fabian Berkner: “*Defining H-Termination for the Analysis of Haskell Programs*”
9. Jonas Säuberlich: “*Integration of Advanced Interpretation Techniques for Termination Analysis of (Probabilistic) Term Rewriting*”
10. Grigory Vartanyan: “*Using Dependency Tuples for Proving Relative Termination of Term Rewriting*” ([related published paper](#))

## PRESENTATIONS

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- **PhD Student in Computer Science**  
RWTH Aachen University

Aachen, Germany  
Oct 2022 – Expected 2026

## MANAGEMENT & LEADERSHIP EXPERIENCE

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- **App-Stone GmbH** 

Founder & Shareholder

Soest, Germany  
Mai 2018 – Oct 2025

- **Foundation:** Co-founded Capybara Software UG in 2018 and App-Stone GmbH after two years of growth. Both companies specialize in on-demand iOS and Android app development.
- **Management & Leadership:** Managed a team of up to 10 employees across various departments. Handled business decisions, hiring, project management, planning, and drafting project proposals with price calculations.

Software Engineer

Mai 2018 – Oct 2025

- **Android Development:** Mobile apps in Android Studio (Java)
- **iOS Development:** Mobile apps in Xcode (Swift)
- **Hybrid Mobile Development:** Multi-platform apps with Flutter (Dart)
- **Server Development:** Backends with Django. Dockerized with Postgres, Gunicorn, Nginx. Deployed on AWS
- **Testing & Debugging:** JUnit testing, error analysis with Firebase Crashlytics

## PROJECT HIGHLIGHTS

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- **AProVE:** AProVE (Automated Program Verification Environment Web Interface) is a tool for automatically proving termination, runtime complexity, safety, etc. of several programming languages like Java, C, or Haskell.
- **BWL Champion:** BWL Champion is an app that allows users to test and expand their business knowledge digitally at any time via Quizzes and can even be played competitively.
- **AABC:** African Alphabets of the Bayreuth Cluster (AABC) provides mobiles and desktop PCs (Windows and iOS) with keyboards for all common African languages and scripts.
- **Amsel - Build up your voice:** Amsel is a mobile application for singers of every performance level. It provides many warm-up techniques and exercises to develop a more professional singing voice.

## SKILLS AND HOBBIES

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**Prog. Languages:** Java, Python, Dart

**Technologies:** AWS, Docker, Git

**Hobbies:** Competitive (E-)Sports, e.g., playing Handball, playing E-Bass and learning piano