

# MATTHIAS SCHLAIPFER

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Final-year doctoral student in computer science at TU Wien, Austria. Main research interests in program synthesis, formal methods, proof theory, and programming languages. Internships at Amazon Web Services, at Microsoft Research in Cambridge and India, and a research stay at Princeton University. Experienced with academic work, and software development in various areas, from databases to proof transformations.

## EDUCATION

**LogiCS Doctoral Program** since 9/14 ~> 2020  
TU Wien, Austria  
**Dipl.-Ing., Computer Science** 7/14  
**BSc, Computer Science** 2/11  
Graz University of Technology, Austria  
Master's Thesis: Determinization of Boolean Relations Using Interpolants  
Supervisors: Prof. Roderick Bloem, and Prof. Sharad Malik  
*Graduated with distinction*

## EXPERIENCE

**Amazon Web Services** 5/19-8/19  
*Software Development Engineer Intern (Automated Reasoning Group)*  
Working with and on the Dafny program verifier.  
**Microsoft Research India** 8/17-11/17  
**Microsoft Research India** 6/16-8/16  
*Research Intern (Programming Languages & Tools)*  
Optimization of big-data queries using program synthesis. Published at SOSP '17.  
**Microsoft Research Cambridge** 5/15-7/15  
*Research Intern (Programming Principles & Tools)*  
Implemented improvements to the Datalog engine of the Z3 SMT solver in C++.  
**Princeton University** 9/11-2/12  
*Visiting Student Research Collaborator (Malik Group)*  
Research on proof compression. Published at HVC '14.

## FURTHER EDUCATION

*Summer School on Formal Techniques (SSFT '18)* 6/18  
*Google PhD Student Summit on Compiler & Programming Technology* 12/15 & 12/14  
*Marktoberdorf Summer School 2015* 8/15

## SKILLS

**Languages:** Fluent in German and English.  
**Programming Languages:** Scala, F#, C, C++, Python, Dafny, Java, SQL, C#, SystemVerilog, etc.  
**Technical Talks:** Experience giving public talks at conferences and for research groups.  
**Teaching:** Teaching assistant from 2017-2018 (course "Formal Methods in Computer Science").

## PUBLICATIONS

Publications in various research conferences, both in the areas of systems and formal methods. Among others at SOSP and the Journal of Automated Reasoning. Most recent publications:

**Efficient translation of sequent calculus proofs into natural deduction proofs**

*Practical Aspects of Automated Reasoning 2018 with Gabriel Ebner.*

**Optimizing Big-Data Queries Using Program Synthesis**

*SOSP 2017: 26th Symposium on Operating Systems Principles with Kaushik Rajan, Akash Lal, and Malavika Samak.*

**Labelled Interpolation Systems for Hyper-Resolution, Clausal, and Local Proofs**

*Journal of Automated Reasoning with Georg Weissenbacher.*

## PATENTS

**Program synthesis for query optimization**

*US Patent App. 15/851,746, 2019 with Kaushik Rajan, and Akash Lal*