

Stefan Jens Zetsche

Residence	London, United Kingdom (German Citizenship, UK Pre-Settled Status)
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Languages	Native German, Full Professional English, Elementary French
Programming Languages	Python, Java, C, SQL, OCaml, Prolog, Dafny

Education

2018-2022	University College London PhD Computer Science <i>Supervisor:</i> Alexandra Silva <i>Background:</i> 'Automata learning' aims to <i>automatically</i> infer a mathematical model capturing all relevant properties of a system by observing its behaviour. The incremental approach has been successfully applied to a wide range of tasks in industrial applications, targeting productive, tested, secure, large-scale systems. My research focuses on identifying size-minimal target models and optimizing learning algorithms for specific domains. I have implemented several algorithms in the functional language 'Ocaml'. I have published (Mfps), volunteered, and mentored at top tier computer science conferences (Popl, Splash, Cav, Pldi).
2016-2018	University of Hamburg MSc Mathematics (Overall: 1.0 Distinction, Thesis: 1.0 First Class Honours)
2014-2016	University of Hamburg BSc Mathematics and Computer Science (Thesis: 1.0 First Class Honours) Courses in: Python, Java, C, Prolog, Statistics, Analysis, Probability Theory

Internships

July-Sep 2022 (scheduled)	Meta (Facebook) <i>Supervisor:</i> Andrew Kennedy <i>Background:</i> During the internship I will be working on the design of the 'Hack' programming language. Facebook's web codebase currently contains more than 100 million lines of Hack code, and changes thousands of times per day. 'Hack' has its origins in 'PHP' but is evolving rapidly, most notably by adding a sophisticated type system. The team works mainly in 'OCaml' and 'Rust'.
Aug-Nov 2021	Amazon (AWS) <i>Supervisor:</i> Rustan Leino <i>Background:</i> I have been part of the Automated Reasoning Group, which uses mathematical logic to build tools that provide Amazon Web Service (AWS) customers with provable security. For example, AWS uses cloud models to verify whether or not access controls meet governance rules and whether networks are properly secured. While testing and debugging project the correctness of a program for most inputs, mathematical logic ensures the correctness for all inputs. During the internship, I have implemented a fully-verified quantum circuit optimizer. The project has been in collaboration with the 'Braket' team, AWS's quantum service.

Teaching

University College London	Python '20 • Logic and Database '21 • Discrete Mathematics for Computer Scientists '19, '20, '21 • Computability and Complexity '21 • Theory of Computation '20
University of Hamburg	Analysis I '17 • Linear Algebra and Analytic Geometry I & II '16

Publications

Prints	<i>Canonical Automata via Distributive Law Homomorphisms</i> , Mfps 2021
Preprints	<i>Guarded Kleene Algebra with Tests: Automata Learning</i> , 2022 <i>Generators and Bases for Monadic Closures</i> , 2022 <i>Generalised Duality Theory for Monoidal Categories and Applications</i> , 2018 <i>Isomorphism Classes of Vertex-Transitive Tournaments</i> , 2016