

September 8–13, 2019, Dagstuhl Seminar 19371

Deduction Beyond Satisfiability

Monday, 09.09.19

09:00 Session 1: Welcome & Introductions Chair: Carsten Fuhs
Welcome
The organisers
Introductions
All participants

10:30 Tea/Coffee Break

11:00 Session 2: Proof Reconstruction Chair: Cesare Tinelli
Proofs in SMT
Haniel Barbosa, Jasmin Blanchette, Pascal Fontaine, Hans-Jörg Schurr
Proof reconstruction in conflict-driven satisfiability
Maria Paola Bonacina, Stéphane Graham-Lengrand, Natarajan Shankar

12:15 Lunch

14:00 Session 3: Program Analysis Chair: Carsten Fuhs
Abstract Execution
Reiner Hähnle, Dominic Steinhöfel
Code commutation
Albert Rubio
Loop Acceleration for Under-Approximating Program Analysis
Florian Frohn, Jürgen Giesl, Marc Brockschmidt, Matthias Naaf

15:30 Tea/Coffee + Cake

16:15 Session 4: HO Proofs & Programs, Generic Reasoning Chair: Renate Schmidt
Proof Checking in Zipperposition
Alexander Bentkamp, Simon Cruanes
A Fixpoint Logic and Dependent Effects for Temporal Property Verification
Yoji Nanjo, Hiroshi Unno, Eric Koskinen, Tachio Terauchi
Saturation Theorem Proving: From Inference Rules to Provers
Uwe Waldmann, Sophie Tourret, Simon Robillard, Jasmin Blanchette

18:00 Dinner

Tuesday, 10.09.19

- 09:00 Session 5: QBF** Chair: Joao Marques-Silva
Tractable QBF and model counting via Knowledge Compilation
Florent Capelli
Proof Systems for Quantified Boolean Formulas
Martina Seidl
- 10:00 Tea/Coffee Break**
- 10:30 Session 6: Applications** Chair: Reiner Hähnle
Network Verification at Hyperscale: Challenges and Opportunities
Andrey Rybalchenko
Correct-by-Decision Solving and Applications
Alexander Nadel
The Logical ECU
Christoph Weidenbach
- 12:15 Lunch**
- 14:00 Session 7: Proof analysis, induction** Chair: Laura Kovács
Algorithmic Analysis of Proofs via CERES
Alexander Leitsch
Inductive Inference with Recursion Analysis in Separation Logic
Quang Loc Le
Efficient Validation of FOLID Cyclic Induction Reasoning
Sorin Stratulat
- 15:30 Tea/Coffee + Cake**
- 16:15 Session 8: Description Logics, Abduction, Forgetting** Chair: Andrzej Szalas
Forgetting-Based Abductive Reasoning and Inductive Learning in Ontologies
Warren Del-Pinto, Renate A. Schmidt
Abduction in DL by translation to FOL
Sophie Tourret, Patrick Koopmann, Christoph Weidenbach
Forgetting for Computing Snap-Shots of Ontologies: Progress and Challenges
Renate Schmidt
- 18:00 Dinner**

Wednesday, 11.09.19

- 09:00 Session 9: Constrained Horn Clauses & Induction** Chair: Pascal Fontaine
Spacer on Jupyter
Arie Gurfinkel
Induction in saturation-based proof search
Andrei Voronkov
- 10:00 Tea/Coffee Break**
- 10:30 Session 10: Probabilities & Loops** Chair: Jürgen Giesl
Rule-Based Nonmonotonic Reasoning with Probabilities
Andrzej Szalas
Reasoning about Expected Runtimes of Probabilistic Programs
Benjamin Kaminski
Loop Detection by Logically Constrained Rewriting
Sarah Winkler, Naoki Nishida
- 12:15 Lunch**
- 13:30 Excursion to Saarschleife, Cloefpath walk and Brewery tour with Dinner in Mettlach**

Thursday, 12.09.19

- 09:00 Session 11: SAT, MaxSAT & Temporal Specifications** Chair: Martina Seidl
Efficient SAT-Based Reasoning Beyond NP
Joao Marques-Silva
Reactive Synthesis beyond Realizability
Rayna Dimitrova
- 10:00 Tea/Coffee Break**
- 10:30 Session 12: Program Abstraction & Separation Logic** Chair: Ruzica Piskac
Cell morphing: from array programs to array-free Horn clauses
Julien Braine, Laure Gonnord, David Monniaux
Probabilistic Symbolic Execution using Separation Logic
Quoc Sang Phan
Local Reasoning for Global Graph Properties
Siddharth Krishna, Alexander Summers, Thomas Wies
- 12:15 Lunch**
- 14:00 Session 13: SMT, Decomposition & Bit-Vectors** Chair: Philipp Rümmer
Ultimate Automizer and the Search for the Perfect Proof
Matthias Heizmann
Safe Decomposition of Timing Requirements: Verification and Synthesis
Alessandro Cimatti, Luca Geatti, Alberto Griggio, Stefano Tonetta
Logically Constrained Rewriting over Bit Vectors
Naoki Nishida
- 15:30 Tea/Coffee + Cake**
- 16:15 Session 14: Complexity, Neural Networks & Repair** Chair: Benjamin Kaminski
Decision Procedures Beyond Satisfiability
Jürgen Giesl, Florian Frohn, Peter Giesl, Marcel Hark
NeuroCore: Guiding CDCL Solvers with Unsat-Core Predictions
Nikolaj S. Bjørner, Daniel Selsam
Using SMT solvers to reason about firewalls
Ruzica Piskac
- 18:00 Dinner**

Friday, 13.09.19

09:00 Session 15: Runtime Complexity & Symbol Elimination Chair: Sarah Winkler
From Derivational Complexity to Runtime Complexity of Term Rewriting

Carsten Fuhs

On Hierarchical Symbol Elimination and Applications

Viorica Sofronie-Stokkermans

10:00 Tea/Coffee Break

10:30 Session 16: Preferences, Interpolation & Abduction Chair: David Monniaux
A Resolution Calculus for Preferential Logic

Claudia Nalon, Dirk Pattinson

Bit-Vector Interpolation and Quantifier Elimination by Lazy Reduction

Peter Backeman, Philipp Rümmer, Aleksandar Zeljic

From Syntax-Guided Synthesis to Abduction: Explorations in CVC4

Cesare Tinelli

12:15 Lunch

14:00 Departure