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Hana Chockler · Georg Weissenbacher (Eds.)

Computer Aided Verification

30th International Conference, CAV 2018

Held as Part of the Federated Logic Conference, FloC 2018


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Proceedings, Part II



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Preface

It was our privilege to serve as the program chairs for CAV 2018, the 30th International Conference on Computer-Aided Verification. CAV is an annual conference dedicated to the advancement of the theory and practice of computer-aided formal analysis methods for hardware and software systems. CAV 2018 was held in Oxford, UK, July 14–17, 2018, with the tutorials day on July 13.

This year, CAV was held as part of the Federated Logic Conference (FLoC) event and was collocated with many other conferences in logic. The primary focus of CAV is to spur advances in hardware and software verification while expanding to new domains such as learning, autonomous systems, and computer security. CAV is at the cutting edge of research in formal methods, as reflected in this year’s program.

CAV 2018 covered a wide spectrum of subjects, from theoretical results to concrete applications, including papers on application of formal methods in large-scale industrial settings. It has always been one of the primary interests of CAV to include papers that describe practical verification tools and solutions and techniques that ensure a high practical appeal of the results. The proceedings of the conference are published in Springer’s *Lecture Notes in Computer Science* series. A selection of papers were invited to a special issue of *Formal Methods in System Design* and the *Journal of the ACM*.

This is the first year that the CAV proceedings are published under an Open Access license, thus giving access to CAV proceedings to a broad audience. We hope that this decision will increase the scope of practical applications of formal methods and will attract even more interest from industry.

CAV received a very high number of submissions this year—215 overall—resulting in a highly competitive selection process. We accepted 13 tool papers and 52 regular papers, which amounts to an acceptance rate of roughly 30% (for both regular papers and tool papers). The high number of excellent submissions in combination with the scheduling constraints of FLoC forced us to reduce the length of the talks to 15 minutes, giving equal exposure and weight to regular papers and tool papers.

The accepted papers cover a wide range of topics and techniques, from algorithmic and logical foundations of verification to practical applications in distributed, networked, cyber-physical, and autonomous systems. Other notable topics are synthesis, learning, security, and concurrency in the context of formal methods. The proceedings are organized according to the sessions in the conference.

The program featured two invited talks by Eran Yahav (Technion), on using deep learning for programming, and by Somesh Jha (University of Wisconsin Madison) on adversarial deep learning. The invited talks this year reflect the growing interest of the CAV community in deep learning and its connection to formal methods. The tutorial day of CAV featured two invited tutorials, by Shaz Qadeer on verification of concurrent programs and by Matteo Maffei on static analysis of smart contracts. The subjects of the tutorials reflect the increasing volume of research on verification of

concurrent software and, as of recently, the question of correctness of smart contracts. As every year, one of the winners of the CAV award also contributed a presentation. The tutorial day featured a workshop in memoriam of Mike Gordon, titled “Three Research Vignettes in Memory of Mike Gordon,” organized by Tom Melham and jointly supported by CAV and ITP communities.

Moreover, we continued the tradition of organizing a LogicLounge. Initiated by the late Helmut Veith at the Vienna Summer of Logic 2014, the LogicLounge is a series of discussions on computer science topics targeting a general audience and has become a regular highlight at CAV. This year’s LogicLounge took place at the Oxford Union and was on the topic of “Ethics and Morality of Robotics,” moderated by Judy Wajcman and featuring a panel of experts on the topic: Luciano Floridi, Ben Kuipers, Francesca Rossi, Matthias Scheutz, Sandra Wachter, and Jeannette Wing. We thank May Chan, Katherine Fletcher, and Marta Kwiatkowska for organizing this event, and the Vienna Center of Logic and Algorithms for their support.

In addition, CAV attendees enjoyed a number of FLoC plenary talks and events targeting the broad FLoC community.

In addition to the main conference, CAV hosted the Verification Mentoring Workshop for junior scientists entering the field and a high number of pre- and post-conference technical workshops: the Workshop on Formal Reasoning in Distributed Algorithms (FRIDA), the workshop on Runtime Verification for Rigorous Systems Engineering (RV4RISE), the 5th Workshop on Horn Clauses for Verification and Synthesis (HCVS), the 7th Workshop on Synthesis (SYNT), the First International Workshop on Parallel Logical Reasoning (PLR), the 10th Working Conference on Verified Software: Theories, Tools and Experiments (VSTTE), the Workshop on Machine Learning for Programming (MLP), the 11th International Workshop on Numerical Software Verification (NSV), the Workshop on Verification of Engineered Molecular Devices and Programs (VEMDP), the Third Workshop on Fun With Formal Methods (FWFM), the Workshop on Robots, Morality, and Trust through the Verification Lens, and the IFAC Conference on Analysis and Design of Hybrid Systems (ADHS).

The Program Committee (PC) for CAV consisted of 80 members; we kept the number large to ensure each PC member would have a reasonable number of papers to review and be able to provide thorough reviews. As the review process for CAV is double-blind, we kept the number of external reviewers to a minimum, to avoid accidental disclosures and conflicts of interest. Altogether, the reviewers drafted over 860 reviews and made an enormous effort to ensure a high-quality program. Following the tradition of CAV in recent years, the artifact evaluation was mandatory for tool submissions and optional but encouraged for regular submissions. We used an Artifact Evaluation Committee of 25 members. Our goal for artifact evaluation was to provide friendly “beta-testing” to tool developers; we recognize that developing a stable tool on a cutting-edge research topic is certainly not easy and we hope the constructive comments provided by the Artifact Evaluation Committee (AEC) were of help to the developers. As a result of the evaluation, the AEC accepted 25 of 31 artifacts accompanying regular papers; moreover, all 13 accepted tool papers passed the evaluation. We are grateful to the reviewers for their outstanding efforts in making sure each paper was fairly assessed. We would like to thank our artifact evaluation chair,

Igor Konnov, and the AEC for evaluating all artifacts submitted with tool papers as well as optional artifacts submitted with regular papers.

Of course, without the tremendous effort put into the review process by our PC members this conference would not have been possible. We would like to thank the PC members for their effort and thorough reviews.

We would like to thank the FLoC chairs, Moshe Vardi, Daniel Kroening, and Marta Kwiatkowska, for the support provided, Thanh Hai Tran for maintaining the CAV website, and the always helpful Steering Committee members Orna Grumberg, Aarti Gupta, Daniel Kroening, and Kenneth McMillan. Finally, we would like to thank the team at the University of Oxford, who took care of the administration and organization of FLoC, thus making our jobs as CAV chairs much easier.

July 2018

Hana Chockler
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Lång, Magnus	Raghothaman, Mukund	

Contents – Part II

Tools

Let this Graph Be Your Witness! An Attestor for Verifying Java Pointer Programs.	3
<i>Hannah Arndt, Christina Jansen, Joost-Pieter Katoen, Christoph Matheja, and Thomas Noll</i>	
MaxSMT-Based Type Inference for Python 3.	12
<i>Mostafa Hassan, Caterina Urban, Marco Eilers, and Peter Müller</i>	
The JKIND Model Checker	20
<i>Andrew Gacek, John Backes, Mike Whalen, Lucas Wagner, and Elaheh Ghassabani</i>	
The DEEPSEC Prover.	28
<i>Vincent Cheval, Steve Kremer, and Itsaka Rakotonirina</i>	
SimpleCAR: An Efficient Bug-Finding Tool Based on Approximate Reachability	37
<i>Jianwen Li, Rohit Dureja, Geguang Pu, Kristin Yvonne Rozier, and Moshe Y. Vardi</i>	
StringFuzz: A Fuzzer for String Solvers.	45
<i>Dmitry Blotsky, Federico Mora, Murphy Berzish, Yunhui Zheng, Ifaz Kabir, and Vijay Ganesh</i>	

Static Analysis

Permission Inference for Array Programs	55
<i>Jérôme Dohrau, Alexander J. Summers, Caterina Urban, Severin Münger, and Peter Müller</i>	
Program Analysis Is Harder Than Verification: A Computability Perspective	75
<i>Patrick Cousot, Roberto Giacobazzi, and Francesco Ranzato</i>	

Theory and Security

Automata vs Linear-Programming Discounted-Sum Inclusion	99
<i>Suguman Bansal, Swarat Chaudhuri, and Moshe Y. Vardi</i>	

Model Checking Indistinguishability of Randomized Security Protocols	117
<i>Matthew S. Bauer, Rohit Chadha, A. Prasad Sista, and Mahesh Viswanathan</i>	
Lazy Self-composition for Security Verification	136
<i>Weikun Yang, Yakir Vizel, Pramod Subramanyan, Aarti Gupta, and Sharad Malik</i>	
SCINFER: Refinement-Based Verification of Software Countermeasures Against Side-Channel Attacks.	157
<i>Jun Zhang, Pengfei Gao, Fu Song, and Chao Wang</i>	
Symbolic Algorithms for Graphs and Markov Decision Processes with Fairness Objectives	178
<i>Krishnendu Chatterjee, Monika Henzinger, Veronika Loitzenbauer, Simin Oraee, and Viktor Toman</i>	
Attracting Tangles to Solve Parity Games	198
<i>Tom van Dijk</i>	
SAT, SMT and Decision Procedures	
Delta-Decision Procedures for Exists-Forall Problems over the Reals.	219
<i>Soonho Kong, Armando Solar-Lezama, and Sicun Gao</i>	
Solving Quantified Bit-Vectors Using Invertibility Conditions.	236
<i>Aina Niemetz, Mathias Preiner, Andrew Reynolds, Clark Barrett, and Cesare Tinelli</i>	
Understanding and Extending Incremental Determinization for 2QBF	256
<i>Markus N. Rabe, Leander Tentrup, Cameron Rasmussen, and Sanjit A. Seshia</i>	
The Proof Complexity of SMT Solvers	275
<i>Robert Robere, Antonina Kolokolova, and Vijay Ganesh</i>	
Model Generation for Quantified Formulas: A Taint-Based Approach	294
<i>Benjamin Farinier, Sébastien Bardin, Richard Bonichon, and Marie-Laure Potet</i>	
Concurrency	
Partial Order Aware Concurrency Sampling	317
<i>Xinhao Yuan, Junfeng Yang, and Ronghui Gu</i>	
Reasoning About TSO Programs Using Reduction and Abstraction	336
<i>Ahmed Bouajjani, Constantin Enea, Suha Orhun Mutluergil, and Serdar Tasiran</i>	

Quasi-Optimal Partial Order Reduction	354
<i>Huyen T. T. Nguyen, César Rodríguez, Marcelo Sousa, Camille Coti, and Laure Petrucci</i>	
On the Completeness of Verifying Message Passing Programs Under Bounded Asynchrony	372
<i>Ahmed Bouajjani, Constantin Enea, Kailiang Ji, and Shaz Qadeer</i>	
Constrained Dynamic Partial Order Reduction	392
<i>Elvira Albert, Miguel Gómez-Zamalloa, Miguel Isabel, and Albert Rubio</i>	
CPS, Hardware, Industrial Applications	
Formal Verification of a Vehicle-to-Vehicle (V2V) Messaging System	413
<i>Mark Tullsen, Lee Pike, Nathan Collins, and Aaron Tomb</i>	
Continuous Formal Verification of Amazon s2n	430
<i>Andrey Chudnov, Nathan Collins, Byron Cook, Joey Dodds, Brian Huffman, Colm MacCárthaigh, Stephen Magill, Eric Mertens, Eric Mullen, Serdar Tasiran, Aaron Tomb, and Eddy Westbrook</i>	
Symbolic Liveness Analysis of Real-World Software.	447
<i>Daniel Schemmel, Julian Bünig, Oscar Soria Dustmann, Thomas Noll, and Klaus Wehrle</i>	
Model Checking Boot Code from AWS Data Centers	467
<i>Byron Cook, Kareem Khazem, Daniel Kroening, Serdar Tasiran, Michael Tautschnig, and Mark R. Tuttle</i>	
Android Stack Machine	487
<i>Taolue Chen, Jinlong He, Fu Song, Guozhen Wang, Zhilin Wu, and Jun Yan</i>	
Formally Verified Montgomery Multiplication	505
<i>Christoph Walther</i>	
Inner and Outer Approximating Flowpipes for Delay Differential Equations	523
<i>Eric Goubault, Sylvie Putot, and Lorenz Sahlmann</i>	
Author Index	543

Contents – Part I

Invited Papers

Semantic Adversarial Deep Learning	3
<i>Tommaso Dreossi, Somesh Jha, and Sanjit A. Seshia</i>	
From Programs to Interpretable Deep Models and Back.	27
<i>Eran Yahav</i>	
Formal Reasoning About the Security of Amazon Web Services.	38
<i>Byron Cook</i>	

Tutorials

Foundations and Tools for the Static Analysis of Ethereum Smart Contracts. . .	51
<i>Ilya Grishchenko, Matteo Maffei, and Clara Schneidewind</i>	
Layered Concurrent Programs.	79
<i>Bernhard Kragl and Shaz Qadeer</i>	

Model Checking

Propositional Dynamic Logic for Higher-Order Functional Programs.	105
<i>Yuki Satake and Hiroshi Unno</i>	
Syntax-Guided Termination Analysis.	124
<i>Grigory Fedyukovich, Yueling Zhang, and Aarti Gupta</i>	
Model Checking Quantitative Hyperproperties	144
<i>Bernd Finkbeiner, Christopher Hahn, and Hazem Torfah</i>	
Exploiting Synchrony and Symmetry in Relational Verification	164
<i>Lauren Pick, Grigory Fedyukovich, and Aarti Gupta</i>	
JBMC: A Bounded Model Checking Tool for Verifying Java Bytecode.	183
<i>Lucas Cordeiro, Pascal Kesseli, Daniel Kroening, Peter Schrammel, and Marek Trtik</i>	
Eager Abstraction for Symbolic Model Checking	191
<i>Kenneth L. McMillan</i>	

Program Analysis Using Polyhedra

Fast Numerical Program Analysis with Reinforcement Learning	211
<i>Gagandeep Singh, Markus Püschel, and Martin Vechev</i>	
A Direct Encoding for NNC Polyhedra	230
<i>Anna Becchi and Enea Zaffanella</i>	

Synthesis

What’s Hard About Boolean Functional Synthesis?	251
<i>S. Akshay, Supratik Chakraborty, Shubham Goel, Sumith Kulal, and Shetal Shah</i>	
Counterexample Guided Inductive Synthesis Modulo Theories	270
<i>Alessandro Abate, Cristina David, Pascal Kesseli, Daniel Kroening, and Elizabeth Polgreen</i>	
Synthesizing Reactive Systems from Hyperproperties	289
<i>Bernd Finkbeiner, Christopher Hahn, Philip Lukert, Marvin Stenger, and Leander Tentrup</i>	
Reactive Control Improvisation	307
<i>Daniel J. Fremont and Sanjit A. Seshia</i>	
Constraint-Based Synthesis of Coupling Proofs	327
<i>Aws Albarghouthi and Justin Hsu</i>	
Controller Synthesis Made Real: Reach-Avoid Specifications and Linear Dynamics	347
<i>Chuchu Fan, Umang Mathur, Sayan Mitra, and Mahesh Viswanathan</i>	
Synthesis of Asynchronous Reactive Programs from Temporal Specifications	367
<i>Suguman Bansal, Kedar S. Namjoshi, and Yaniv Sa’ar</i>	
Syntax-Guided Synthesis with Quantitative Syntactic Objectives	386
<i>Qinheping Hu and Loris D’Antoni</i>	

Learning

Learning Abstractions for Program Synthesis	407
<i>Xinyu Wang, Greg Anderson, Isil Dillig, and K. L. McMillan</i>	
The Learnability of Symbolic Automata	427
<i>George Argyros and Loris D’Antoni</i>	

Runtime Verification, Hybrid and Timed Systems

Reachable Set Over-Approximation for Nonlinear Systems Using Piecewise Barrier Tubes	449
<i>Hui Kong, Ezio Bartocci, and Thomas A. Henzinger</i>	
Space-Time Interpolants.	468
<i>Goran Frehse, Mirco Giacobbe, and Thomas A. Henzinger</i>	
Monitoring Weak Consistency	487
<i>Michael Emmi and Constantin Enea</i>	
Monitoring CTMCs by Multi-clock Timed Automata.	507
<i>Yijun Feng, Joost-Pieter Katoen, Haokun Li, Bican Xia, and Naijun Zhan</i>	
Start Pruning When Time Gets Urgent: Partial Order Reduction for Timed Systems	527
<i>Frederik M. Bønneland, Peter Gjør Jensen, Kim Guldstrand Larsen, Marco Muñoz, and Jiří Srba</i>	
A Counting Semantics for Monitoring LTL Specifications over Finite Traces	547
<i>Ezio Bartocci, Roderick Bloem, Dejan Nickovic, and Franz Roeck</i>	

Tools

Rabinizer 4: From LTL to Your Favourite Deterministic Automaton	567
<i>Jan Křetínský, Tobias Meggendorfer, Salomon Sickert, and Christopher Ziegler</i>	
Strix: Explicit Reactive Synthesis Strikes Back!	578
<i>Philipp J. Meyer, Salomon Sickert, and Michael Luttenberger</i>	
Btor2 , BtorMC and Boolector 3.0	587
<i>Aina Niemetz, Mathias Preiner, Clifford Wolf, and Armin Biere</i>	
Nagini: A Static Verifier for Python	596
<i>Marco Eilers and Peter Müller</i>	
PEREGRINE: A Tool for the Analysis of Population Protocols	604
<i>Michael Blondin, Javier Esparza, and Stefan Jaax</i>	
ADAC: Automated Design of Approximate Circuits	612
<i>Milan Češka, Jiří Matyáš, Vojtech Mrazek, Lukas Sekanina, Zdenek Vasicek, and Tomáš Vojnar</i>	

Probabilistic Systems

Value Iteration for Simple Stochastic Games: Stopping Criterion
and Learning Algorithm. 623
*Edon Kelmendi, Julia Krämer, Jan Křetínský,
and Maximilian Weininger*

Sound Value Iteration 643
Tim Quatmann and Joost-Pieter Katoen

Safety-Aware Apprenticeship Learning 662
Weichao Zhou and Wenchao Li

Deciding Probabilistic Bisimilarity Distance One for Labelled
Markov Chains 681
Qiyi Tang and Franck van Breugel

Author Index 701