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Computer Aided Verification

30th International Conference, CAV 2018
Held as Part of the Federated Logic Conference, FloC 2018
Oxford, UK, July 14–17, 2018
Proceedings, Part II
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 Maffèi 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

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Friedberger, Karlheinz, Ghorbani, Soudeh, Ghosh, Shromona, Goel, Shilpi, Gong, Liang, Govind, Hari, Gu, Yijia, Habermehl, Peter, Hamza, Jad, He, Paul, Heo, Kihong, Holik, Lukas
<table>
<thead>
<tr>
<th>Humenberger, Andreas</th>
<th>Maffei, Matteo</th>
<th>Reynolds, Andrew</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hyvärinen, Antti</td>
<td>Marescotti, Matteo</td>
<td>Reynolds, Thomas</td>
</tr>
<tr>
<td>Hölzl, Johannes</td>
<td>Mathur, Umang</td>
<td>Ritirc, Daniela</td>
</tr>
<tr>
<td>Iusupov, Rinat</td>
<td>Miné, Antoine</td>
<td>Rogalewicz, Adam</td>
</tr>
<tr>
<td>Jacobs, Swen</td>
<td>Mora, Federico</td>
<td>Scott, Joe</td>
</tr>
<tr>
<td>Jain, Mitesh</td>
<td>Nevo, Ziv</td>
<td>Shacham, Ohad</td>
</tr>
<tr>
<td>Jaroschek, Maximilian</td>
<td>Ochoa, Martin</td>
<td>Song, Yahui</td>
</tr>
<tr>
<td>Jha, Sumit Kumar</td>
<td>Orni, Avigail</td>
<td>Sousa, Marcelo</td>
</tr>
<tr>
<td>Keidar-Barner, Sharon</td>
<td>Ouaknine, Joel</td>
<td>Subramanian, Kausik</td>
</tr>
<tr>
<td>Khalimov, Ayrat</td>
<td>Padhye, Rohan</td>
<td>Summers, Rob</td>
</tr>
<tr>
<td>Kiesl, Benjamin</td>
<td>Padon, Oded</td>
<td>Swords, Sol</td>
</tr>
<tr>
<td>Koenighofer, Bettina</td>
<td>Partush, Nimrod</td>
<td>Ta, Quang Trung</td>
</tr>
<tr>
<td>Krstic, Srdjan</td>
<td>Pavlinovic, Zvonimir</td>
<td>Tautschnig, Michael</td>
</tr>
<tr>
<td>Laeufer, Kevin</td>
<td>Pavlogiannis, Andreas</td>
<td>Traytel, Dmitriy</td>
</tr>
<tr>
<td>Lee, Woosuk</td>
<td>Peled, Doron</td>
<td>Trivedi, Ashutosh</td>
</tr>
<tr>
<td>Lemberger, Thomas</td>
<td>Pendharkar, Ishan</td>
<td>Udupa, Abhishek</td>
</tr>
<tr>
<td>Lemieux, Caroline</td>
<td>Peng, Yan</td>
<td>van Dijk, Tom</td>
</tr>
<tr>
<td>Lewis, Robert</td>
<td>Petri, Gustavo</td>
<td>Wendler, Philipp</td>
</tr>
<tr>
<td>Liang, Jia</td>
<td>Polozov, Oleksandr</td>
<td>Zdancewic, Steve</td>
</tr>
<tr>
<td>Liang, Jimmy</td>
<td>Popescu, Andrei</td>
<td>Zulkoski, Ed</td>
</tr>
<tr>
<td>Liu, Peizun</td>
<td>Potomkin, Kostiantyn</td>
<td></td>
</tr>
<tr>
<td>Lång, Magnus</td>
<td>Raghothaman, Mukund</td>
<td></td>
</tr>
</tbody>
</table>
Contents – Part II

Tools

Let this Graph Be Your Witness! An Attestor for Verifying Java Pointer Programs. ................................................................. 3
   Hannah Arndt, Christina Jansen, Joost-Pieter Katoen,
   Christoph Matheja, and Thomas Noll

MaxSMT-Based Type Inference for Python 3 ........................................... 12
   Mostafa Hassan, Caterina Urban, Marco Eilers, and Peter Müller

The JKIND Model Checker ................................................................. 20
   Andrew Gacek, John Backes, Mike Whalen, Lucas Wagner,
   and Elaheh Ghassabani

The DEEPSEC Prover ................................................................. 28
   Vincent Cheval, Steve Kremer, and Itsaka Rakotonirina

SimpleCAR: An Efficient Bug-Finding Tool Based on Approximate Reachability ................................................................. 37
   Jianwen Li, Rohit Dureja, Geguang Pu, Kristin Yvonne Rozier,
   and Moshe Y. Vardi

StringFuzz: A Fuzzer for String Solvers ........................................... 45
   Dmitry Blotsky, Federico Mora, Murphy Berzish, Yunhui Zheng,
   Ifaz Kabir, and Vijay Ganesh

Static Analysis

Permission Inference for Array Programs ........................................... 55
   Jérôme Dohrau, Alexander J. Summers, Caterina Urban,
   Severin Münger, and Peter Müller

Program Analysis Is Harder Than Verification:
A Computability Perspective .......................................................... 75
   Patrick Cousot, Roberto Giacobazzi, and Francesco Ranzato

Theory and Security

Automata vs Linear-Programming Discounted-Sum Inclusion ............. 99
   Suguman Bansal, Swarat Chaudhuri, and Moshe Y. Vardi
Model Checking Indistinguishability of Randomized Security Protocols

Matthew S. Bauer, Rohit Chadha, A. Prasad Sistla, and Mahesh Viswanathan

Lazy Self-composition for Security Verification

Weikun Yang, Yakir Vizel, Pramod Subramanyan, Aarti Gupta, and Sharad Malik

SCINFER: Refinement-Based Verification of Software Countermeasures Against Side-Channel Attacks

Jun Zhang, Pengfei Gao, Fu Song, and Chao Wang

Symbolic Algorithms for Graphs and Markov Decision Processes with Fairness Objectives

Krishnendu Chatterjee, Monika Henzinger, Veronika Loitzenbauer, Simin Oraee, and Viktor Toman

Attracting Tangles to Solve Parity Games

Tom van Dijk

SAT, SMT and Decision Procedures

Delta-Decision Procedures for Exists-Forall Problems over the Reals

Soonho Kong, Armando Solar-Lezama, and Sicun Gao

Solving Quantified Bit-Vectors Using Invertibility Conditions

Aina Niemetz, Mathias Preiner, Andrew Reynolds, Clark Barrett, and Cesare Tinelli

Understanding and Extending Incremental Determinization for 2QBF

Markus N. Rabe, Leander Tentrup, Cameron Rasmussen, and Sanjit A. Seshia

The Proof Complexity of SMT Solvers

Robert Robere, Antonina Kolokolova, and Vijay Ganesh

Model Generation for Quantified Formulas: A Taint-Based Approach

Benjamin Farinier, Sébastien Bardin, Richard Bonichon, and Marie-Laure Potet

Concurrency

Partial Order Aware Concurrency Sampling

Xinhao Yuan, Junfeng Yang, and Ronghui Gu

Reasoning About TSO Programs Using Reduction and Abstraction

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

Invited Papers

Semantic Adversarial Deep Learning ........................................... 3
  Tommaso Dreossi, Somesh Jha, and Sanjit A. Seshia

From Programs to Interpretable Deep Models and Back ......................... 27
  Eran Yahav

Formal Reasoning About the Security of Amazon Web Services ................ 38
  Byron Cook

Tutorials

Foundations and Tools for the Static Analysis of Ethereum Smart Contracts ... 51
  Ilya Grishchenko, Matteo Maffei, and Clara Schneidewind

Layered Concurrent Programs .................................................... 79
  Bernhard Kragl and Shaz Qadeer

Model Checking

Propositional Dynamic Logic for Higher-Order Functional Programs .......... 105
  Yuki Satake and Hiroshi Unno

Syntax-Guided Termination Analysis ........................................... 124
  Grigory Fedyukovich, Yueling Zhang, and Aarti Gupta

Model Checking Quantitative Hyperproperties .................................. 144
  Bernd Finkbeiner, Christopher Hahn, and Hazem Torfah

Exploiting Synchrony and Symmetry in Relational Verification ............... 164
  Lauren Pick, Grigory Fedyukovich, and Aarti Gupta

JBMC: A Bounded Model Checking Tool for Verifying Java Bytecode ........ 183
  Lucas Cordeiro, Pascal Kesseli, Daniel Kroening, Peter Schrammel,
  and Marek Trtik

Eager Abstraction for Symbolic Model Checking ................................ 191
  Kenneth L. McMillan
Program Analysis Using Polyhedra

Fast Numerical Program Analysis with Reinforcement Learning .......................... 211  
Gagandeep Singh, Markus Püschel, and Martin Vechev

A Direct Encoding for NNC Polyhedra .............................................................. 230  
Anna Becchi and Enea Zaffanella

Synthesis

What’s Hard About Boolean Functional Synthesis? .............................................. 251  
S. Akshay, Supratik Chakraborty, Shubham Goel, Sumith Kulal,  
and Shetal Shah

Counterexample Guided Inductive Synthesis Modulo Theories .............................. 270  
Alessandro Abate, Cristina David, Pascal Kesseli, Daniel Kroening,  
and Elizabeth Polgreen

Synthesizing Reactive Systems from Hyperproperties ......................................... 289  
Bernd Finkbeiner, Christopher Hahn, Philip Lukert, Marvin Stenger,  
and Leander Tentrup

Reactive Control Improvisation .......................................................................... 307  
Daniel J. Fremont and Sanjit A. Seshia

Constraint-Based Synthesis of Coupling Proofs ................................................... 327  
Aws Albarghouthi and Justin Hsu

Controller Synthesis Made Real: Reach-Avoid Specifications  
and Linear Dynamics .......................................................................................... 347  
Chuchu Fan, Umang Mathur, Sayan Mitra, and Mahesh Viswanathan

Synthesis of Asynchronous Reactive Programs  
from Temporal Specifications ............................................................................ 367  
Suguman Bansal, Kedar S. Namjoshi, and Yaniv Sa’ar

Syntax-Guided Synthesis with Quantitative Syntactic Objectives .......................... 386  
Qinheping Hu and Loris D’Antoni

Learning

Learning Abstractions for Program Synthesis ...................................................... 407  
Xinyu Wang, Greg Anderson, Isil Dillig, and K. L. McMillan

The Learnability of Symbolic Automata ............................................................. 427  
George Argyros and Loris D’Antoni
Runtime Verification, Hybrid and Timed Systems

Reachable Set Over-Approximation for Nonlinear Systems Using Piecewise Barrier Tubes .............................................. 449  
Hui Kong, Ezio Bartocci, and Thomas A. Henzinger

Space-Time Interpolants .......................................................... 468  
Goran Frehse, Mirco Giacobbe, and Thomas A. Henzinger

Monitoring Weak Consistency .................................................. 487  
Michael Emmi and Constantin Enea

Monitoring CTMCs by Multi-clock Timed Automata .................. 507  
Yijun Feng, Joost-Pieter Katoen, Haokun Li, Bican Xia, and Naijun Zhan

Start Pruning When Time Gets Urgent: Partial Order Reduction for Timed Systems .................................................. 527  
Frederik M. Bonneland, Peter Gjøl Jensen, Kim Guldstrand Larsen, Marco Muñiz, and Jiří Srba

A Counting Semantics for Monitoring LTL Specifications over Finite Traces .................................................. 547  
Ezio Bartocci, Roderick Bloem, Dejan Nickovic, and Franz Roeck

Tools

Rabinizer 4: From LTL to Your Favourite Deterministic Automaton .... 567  
Jan Křetínský, Tobias Meggendorfer, Salomon Sickert, and Christopher Ziegler

Strix: Explicit Reactive Synthesis Strikes Back! .......................... 578  
Philipp J. Meyer, Salomon Sickert, and Michael Luttenberger

BTOR2, BtorMC and Boolector 3.0 ............................................. 587  
Aina Niemetz, Mathias Preiner, Clifford Wolf, and Armin Biere

Nagini: A Static Verifier for Python ........................................... 596  
Marco Eilers and Peter Müller

PEREGRINE: A Tool for the Analysis of Population Protocols .......... 604  
Michael Blondin, Javier Esparza, and Stefan Jaax

ADAC: Automated Design of Approximate Circuits ..................... 612  
Milan Češka, Jiří Matyáš, Vojtech Mrazek, Lukas Sekanina, Zdenek Vasicek, and Tomáš Vojnar
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