Verification Model Checking And Abstract Interpretation 12th International Conference Vmcai 2011 Austin Tx Usa January 23 25 2011 Proceedings Lecture Notes In Computer Science

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Formal Techniques for Networked and Distributed Systems - FORTE 2004 David de Frutos-Escrig 2004-09-09 This book constitutes the refereed proceedings of the 24th IFIP WG 6.1 International Conference on Formal Techniques for Networked and Distributed Systems, FORTE 2004, held in Madrid, Spain, in September 2004. The 20 revised full papers presented together with 3 invited papers were carefully reviewed and selected from 54 submissions. Among the topics addressed are state-based specification, distributed Java objects, UML and SDL, algorithm verification, communicating automata, design recovery, formal protocol testing, testing and model checking, distributed real-time systems, formal composition, distributed testing, automata for ACTL, symbolic state space representation, pi-calculus, concurrency, Petri nets, routing protocol verification, and intrusion detection.

Verification, Model Checking, and Abstract Interpretation Dirk Beyer 2020-01-14 This book constitutes the proceedings of the 21st International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2020. The 21 papers presented in this volume were carefully reviewed from 44 submissions. VMCAI provides a forum for researchers from the communities of verification, model checking, and abstract Interpretation, facilitating interaction, cross-fertilization, and advancement of hybrid methods that combine these and related areas.

Abstraction, Reformulation and Approximation Jean-Daniel Zucker 2005-07-14 This book constitutes the refereed proceedings of the 6th International Symposium on Abstraction, Reformulation, and Approximation, SARA 2005, held in Airth Castle, Scotland, UK in July 2005. The 17 revised full papers and 8 extended abstracts were carefully reviewed and selected for inclusion in the book. Also included are 3 invited papers and 8 research summaries. All current aspects of abstraction, reformulation, and approximation in the context of human common-sense reasoning, problem solving, and efficiently reasoning in complex domains are addressed. Among the application fields of these techniques are automatic programming, constraint satisfaction, design, diagnosis, machine learning, search, planning, reasoning, game playing, scheduling, and theorem proving.

Validation of Evolving Software Hana Chockler 2015-07-01 This book describes the methodology and accompanying technology for reducing the costs of validation of changes by introducing automatic techniques to analyze and test software increments. It builds a unified approach to efficient and reliable validation of changes and upgrades, and may be used as a research monograph and a reference book.

Verification, Model Checking, and Abstract Interpretation Ranjit Jhala 2011-01-11 This book constitutes the refereed proceedings of the 12th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2011, held in Austin, TX, USA, in January 2011, co-located with the Symposium on Principles of Programming Languages, POPL 2011. The 24 revised full papers presented together with 4 invited talks were carefully reviewed and selected from 71 initial submissions. The papers showcases state-of-the-art research in areas such as verification, model checking, abstract interpretation and address any programming paradigm, including concurrent, constraint, functional, imperative, logic and object-oriented programming. Further topics covered are static analysis, deductive methods, program certification, debugging techniques, abstract domains, type systems, and optimization.

Verification, Model Checking, and Abstract Interpretation Lenore D. Zuck 2003-07-01 This volume contains the proceedings of the 4th International Conference on Veri?cation, Model Checking, and Abstract Interpretation (VMCAI 2003), held in New York city, January 9–11, 2003. The purpose of VMCAI was to provide a forum for researchers from three communities—Veri?cation, Model Checking, and Abstract Interpretation—that will facilitate interaction, cross-fertilization, and the advance of hybrid methods that combine the three areas. With the g- wingneedforformaltoolstoreasonaboutcomplex,in?nite-state,andembedded systems, such hybrid methods are bound to be of great importance. Topics covered by VMCAI include program veri?cation, static analysis te- niques, model checking, program certi?cation, type systems, abstract domains, debugging techniques, compiler optimization, embedded systems, and formal analysis of security protocols. VMCAI 2003 was the fourth VMCAI meeting. The previous three were held as workshops (Port Je?erson 1997, Pisa 1998, and Venice 2002). It is the success of the last meeting, and the wide response it generated, that made it clear the time had come to make it an annual conference.

Embedded Software Rajeev Alur 2003-10-02 This book constitutes the refereed proceedings of the Third International Conference on Embedded Software, EMSOFT 2003, held in Philadelphia, PA, USA in October 2003. The 20 revised full papers presented together with three invited papers were carefully reviewed and selected from 60 submissions. All current topics in embedded software are addressed: formal methods and model-based development, middleware and fault tolerance, modelling and analysis, programming languages and compilers, real-time scheduling, resource-aware systems, and systems on a chip.

Tools and Algorithms for the Construction and Analysis of Systems Nicolas Halbwachs 2005-03-23 This book constitutes the refereed proceedings of the 11th International Conference on Tools and Algorithms for the Construction and Analysis of Systems, TACAS 2005, held in Edinburgh, UK in April 2005 as part of ETAPS. The 33 revised full research papers and 8 revised tool demonstration papers presented together with an invited paper were carefully reviewed and selected from a total of 161 submissions. The papers are organized in topical sections on regular model-checking, infinite state machines, abstract interpretation, automata and logics, probabilistic systems and probabilistic model checking, satisfiability, testing, abstraction and reduction, specification and program synthesis, and model-checking.

Formal Methods for Components and Objects Frank S.de Boer 2003-12-01 Largeandcomplexsoftwaresystemsprovidethenecessaryinfrastuctureinall- dustries today. In order to construct such large systems in a systematic manner, the focus in the development methodologies has switched in the last two decades from functional issues to structural issues: both data and functions are enc- sulated into software units that are integrated into large systems by means of various techniques supporting reusability and modi?ability. This encapsulation principleisessentialtoboththeobject-orientedandthemorerecentcompone- based sofware engineering paradigms. Formalmethodshavebeenappliedsuccessfullytotheveri?cationofmedi- sized programs in protocol and hardware design. However, their application to large systems requires the further development of speci?cation and veri?cation techniques supporting the concepts of reusability and modi?ability. In order to bring together researchers and practioners in the areas of so- ware engineering and formal methods, we organized the 1st International S- posium on Formal Methods for Components and Objects (FMCO) in Leiden, The Netherlands, November 5–8, 2002. The program consisted of invited tu- rials and more technical presentations given by leading experts in the ?elds of Theoretical Computer Science and Software Engineering. The symposium was attended by more than 100 people. This volume contains the contributions of the invited speakers to FMCO 2002. We believe that the presented material provides a unique combination of ideas on software engineering and formal methods which we hope will be an inspiration for those aiming at further bridging the gap between the theory and practice of software engineering.

Decision Procedures Daniel Kroening 2016-11-22 A decision procedure is an algorithm that, given a decision problem, terminates with a correct yes/no answer. Here, the authors focus on theories that are expressive enough to model real problems, but are still decidable. Specifically, the book concentrates on decision procedures for first-order theories that are commonly used in automated verification and reasoning, theorem-proving, compiler optimization and operations research. The techniques described in the book draw from fields such as graph theory and logic, and are routinely used in industry. The authors introduce the basic terminology of satisfiability modulo theories and then, in separate chapters, study decision procedures for each of the following theories: propositional logic; equalities and uninterpreted functions; linear arithmetic; bit vectors; arrays; pointer logic; and quantified formulas.

Verification, Model Checking, and Abstract Interpretation Constantin Enea 2019-01-10 This book constitutes the refereed proceedings of the 20th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2019, held in Cascais, Portugal, in January 2019.The 27 full papers presented together with the abstracts of 3 invited keynote talks were carefully reviewed and selected from 62 submissions. VMCAI provides topics including: program verification, model checking, abstract interpretation, program synthesis, static analysis, type systems, deductive methods, program certification, decision procedures, theorem proving, program certification, debugging techniques, program transformation, optimization, and hybrid and cyber-physical systems.

Provably Correct Systems Mike Hinchey 2017-03-01 As computers increasingly control the systems and services we depend upon within our daily lives like transport, communications, and the media, ensuring these systems function correctly is of utmost importance. This book consists of twelve chapters and one historical account that were presented at a workshop in London in 2015, marking the 25th anniversary of the European ESPRIT Basic Research project ‘ProCoS’ (Provably Correct Systems). The ProCoS I and II projects pioneered and accelerated the automation of verification techniques, resulting in a wide range of applications within many trades and sectors such as aerospace, electronics, communications, and retail. The following topics are covered: An historical account of the ProCoS project Hybrid Systems Correctness of Concurrent Algorithms Interfaces and Linking Automatic Verification Run-time Assertions Checking Formal and Semi-Formal Methods Provably Correct Systems provides researchers, designers and engineers with a complete overview of the ProCoS initiative, past and present, and explores current developments and perspectives within the field.

Software Systems Safety O. Grumberg 2014-05-30 Until quite recently, the correctness and security of software systems was a largely theoretical problem relevant only for a small group of computer specialists. Today it is a fundamental problem for society at large, with security breaches in banking software, malware attacks and bugs in programs affecting millions of people and making the headlines almost daily. The computer science community is developing verification and synthesis tools which will mechanize ever more tasks in the design of secure programs. This book presents the papers delivered at the NATO Advanced Study Institute (ASI) Summer School Marktoberdorf 2013 – Software Systems Safety. The participants represented research groups from both industry and academia, and the subjects covered included: software model checking via systematic testing, program synthesis, E voting systems, probabilistic model checking in biology, infinite state model checking, Boolean satisfiability, interactive proof, and software security by information flow control. The Marktoberdorf Summer School is one of the most renowned international computer science summer schools, and this book, with its detailed overview of current research results with special emphasis on the solving of software systems security problems, will be of interest to all those whose work involves systems security.

Computer Aided Verification Ed Brinksma 2003-08-02 This volume contains the proceedings of the conference on Computer Aided V- i?cation (CAV 2002), held in Copenhagen, Denmark on July 27-31, 2002. CAV 2002 was the 14th in a series of conferences dedicated to the advancement of the theory and practice of computer-assisted formal analysis methods for software and hardware systems. The conference covers the spectrum from theoretical - sults to concrete applications, with an emphasis on practical veri?cation tools, including algorithms and techniques needed for their implementation. The c- ference has traditionally drawn contributions from researchers as well as prac- tioners in both academia and industry. This year we received 94 regular paper submissions out of which 35 were selected. Each submission received an average of 4 referee reviews. In addition, the CAV program contained 11 tool presentations selected from 16 submissions. For each tool presentation, a demo was given at the conference. The large number of tool submissions and presentations testi?es to the liveliness of the ?eld and its applied ?avor.

Fundamental Approaches to Software Engineering Heike Wehrheim 2020-04-20 This open access book constitutes the proceedings of the 23rd International Conference on Fundamental Approaches to Software Engineering, FASE 2020, which took place in Dublin, Ireland, in April 2020, and was held as Part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2020. The 23 full papers, 1 tool paper and 6 testing competition papers presented in this volume were carefully reviewed and selected from 81 submissions. The papers cover topics such as requirements engineering, software architectures, specification, software quality, validation, verification of functional and non-functional properties, model-driven development and model transformation, software processes, security and software evolution.

Handbook of Parallel Constraint Reasoning Youssef Hamadi 2018-04-05 This is the first book presenting a broad overview of parallelism in constraint-based reasoning formalisms. In recent years, an increasing number of contributions have been made on scaling constraint reasoning thanks to parallel architectures. The goal in this book is to overview these achievements in a concise way, assuming the reader is familiar with the classical, sequential background. It presents work demonstrating the use of multiple resources from single machine multi-core and GPU-based computations to very large scale distributed execution platforms up to 80,000 processing units. The contributions in the book cover the most important and recent contributions in parallel propositional satisfiability (SAT), maximum satisfiability (MaxSAT), quantified Boolean formulas (QBF), satisfiability modulo theory (SMT), theorem proving (TP), answer set programming (ASP), mixed integer linear programming (MILP), constraint programming (CP), stochastic local search (SLS), optimal path finding with A*, model checking for linear-time temporal logic (MC/LTL), binary decision diagrams (BDD), and model-based diagnosis (MBD). The book is suitable for researchers, graduate students, advanced undergraduates, and practitioners who wish to learn about the state of the art in parallel constraint reasoning.

Hardware and Software: Verification and Testing Ofer Strichman 2017-11-11 This book constitutes the refereed proceedings of the 13th International Haifa Verification Conference, HVC 2017, held in Haifa, Israel in November 2017.The 13 revised full papers presented together with 4 poster and 5 tool demo papers were carefully reviewed and selected from 45 submissions. They are dedicated to advance the state of the art and state of the practice in verification and testing and are discussing future directions of testing and verification for hardware, software, and complex hybrid systems.

Static Analysis Chris Hankin 2005-08-25 This book constitutes the refereed proceedings of the 12th International Symposium on Static Analysis, SAS 2005, held in London, UK in August 2005, co-located with the International Symposium on Logic-based Program Synthesis and Transformation (LOPSTR 2005). The 22 revised full papers presented together with the abstracts of 2 invited talks were carefully reviewed and selected from 66 submissions. The papers address all aspects of static analysis including program and systems verification, shape analysis and logic, termination analysis, security and safety, abstract interpretation and algorithms, abstract domain and data structures, pointer analysis, shape analysis, and data flow analysis.

Verification, Model Checking, and Abstract Interpretation Ranjit Jhala 2011-01-11 This book constitutes the refereed proceedings of the 12th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2011, held in Austin, TX, USA, in January 2011, co-located with the Symposium on Principles of Programming Languages, POPL 2011. The 24 revised full papers presented together with 4 invited talks were carefully reviewed and selected from 71 initial submissions. The papers showcases state-of-the-art research in areas such as verification, model checking, abstract interpretation and address any programming paradigm, including concurrent, constraint, functional, imperative, logic and object-oriented programming. Further topics covered are static analysis, deductive methods, program certification, debugging techniques, abstract domains, type systems, and optimization.

Verification, Model Checking, and Abstract Interpretation Barbara Jobstmann 2015-12-29 This book constitutes the refereed proceedings of the 17th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2016, held in St. Petersburg, FL, USA, in January 2016. The 24 full papers together with 2 invited talks and 1 abstract presented were carefully reviewed and selected from 67

submissions. VMCAI provides topics including: program verification, model checking, abstractinterpretation and abstract domains, program synthesis, static analysis,type systems, deductive methods, program certification, debugging techniques,program transformation, optimization, hybrid and cyber-physical systems.
Computer Aided Verification Rajeev Alur 2004-06-29 This book constitutes the refereed proceedings of the 16th International Conference on Computer Aided Verification, CAV 2004, held in Boston, MA, USA, in July 2004. The 32 revised full research papers and 16 tool papers were carefully reviewed and selected from 144 submissions. The papers cover all current issues in computer aided verification and model checking, ranging from foundational and methodological issues to the evaluation of major tools and systems.
Verification, Model Checking, and Abstract Interpretation Bernd Finkbeiner 2022-02-14 This book constitutes the proceedings of the 23rd International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2022, which took place in Philadelphia, PA, USA, in January 2022. The 22 papers presented in this volume were carefully reviewed from 48 submissions. VMCAI provides a forum for researchers working on verification, model checking, and abstract interpretation and facilitates interaction, cross-fertilization, and advancement of hybrid methods that combine these and related areas.
Software Verification Maria Christakis 2020-12-05 This book constitutes the refereed proceedings of the 12th International Conference on Verified Software, VSTTE 2020, and the 13th International Workshop on Numerical Software Verification, NSV 2020, held in Los Angeles, CA, USA, in July 2020. Due to COVID-19 pandemic the conference was held virtually. The 13 papers presented in this volume were carefully reviewed and selected from 21 submissions. The papers describe large-scale verification efforts that involve collaboration, theory unification, tool integration, and formalized domain knowledge as well as novel experiments and case studies evaluating verification techniques and technologies. The conference was co-located with the 32nd International Conference on Computer-Aided Verification (CAV 2020).
Verification, Model Checking, and Abstract Interpretation Ranjit Jhala 2011-01-19 This book constitutes the refereed proceedings of the 12th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2011, held in Austin, TX, USA, in January 2011, co-located with the Symposium on Principles of Programming Languages, POPL 2011. The 24 revised full papers presented together with 4 invited talks were carefully reviewed and selected from 71 initial submissions. The papers showcases state-of-the-art research in areas such as verification, model checking, abstract interpretation and address any programming paradigm, including concurrent, constraint, functional, imperative, logic and object-oriented programming. Further topics covered are static analysis, deductive methods, program certification, debugging techniques, abstract domains, type systems, and optimization.
Verification, Model Checking, and Abstract Interpretation Byron Cook 2007-11-13 The book constitutes the refereed proceedings of the 7th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2007, held in Nice, France in January 2007. This event was co-located with the Symposium on Principles of Programming Languages (POPL 2007). The 21 revised full papers presented together with three invited lectures and three invited tutorials were carefully reviewed and selected from a total of 85 submissions.
Managed Software Evolution Ralf Reussner 2019-06-26 This open access book presents the outcomes of the “Design for Future – Managed Software Evolution” priority program 1593, which was launched by the German Research Foundation (“Deutsche Forschungsgemeinschaft (DFG)”) to develop new approaches to software engineering with a specific focus on long-lived software systems. The different lifecycles of software and hardware platforms lead to interoperability problems in such systems. Instead of separating the development, adaptation and evolution of software and its platforms, as well as aspects like operation, monitoring and maintenance, they should all be integrated into one overarching process. Accordingly, the book is split into three major parts, the first of which includes an introduction to the nature of software evolution, followed by an overview of the specific challenges and a general introduction to the case studies used in the project. The second part of the book consists of the main chapters on knowledge carrying software, and cover tacit knowledge in software evolution, continuous design decision support, model-based round-trip engineering for software product lines, performance analysis strategies, maintaining security in software evolution, learning from evolution for evolution, and formal verification of evolutionary changes. In turn, the last part of the book presents key findings and spin-offs. The individual chapters there describe various case studies, along with their benefits, deliverables and the respective lessons learned. An overview of future research topics rounds out the coverage. The book was mainly written for scientific researchers and advanced professionals with an academic background. They will benefit from its comprehensive treatment of various topics related to problems that are now gaining in importance, given the higher costs for maintenance and evolution in comparison to the initial development, and the fact that today, most software is not developed from scratch, but as part of a continuum of former and future releases.
Foundations of Software Science and Computation Structures Patricia Bouyer 2022-03-28 This open access book constitutes the proceedings of the 25th International Conference on Foundations of Software Science and Computational Structures, FOSSACS 2022, which was held during April 4-6, 2022, in Munich, Germany, as part of the European Joint Conferences on Theory and Practice of Software, ETAPS 2022. The 23 regular papers presented in this volume were carefully reviewed and selected from 77 submissions. They deal with research on theories and methods to support the analysis, integration, synthesis, transformation, and verification of programs and software systems.
Handbook of Model Checking Edmund M. Clarke 2018-05-18 Model checking is a computer-assisted method for the analysis of dynamical systems that can be modeled by state-transition systems. Drawing from research traditions in mathematical logic, programming languages, hardware design, and theoretical computer science, model checking is now widely used for the verification of hardware and software in industry. The editors and authors of this handbook are among the world's leading researchers in this domain, and the 32 contributed chapters present a thorough view of the origin, theory, and application of model checking. In particular, the editors classify the advances in this domain and the chapters of the handbook in terms of two recurrent themes that have driven much of the research agenda: the algorithmic challenge, that is, designing model-checking algorithms that scale to real-life problems; and the modeling challenge, that is, extending the formalism beyond Kripke structures and temporal logic. The book will be valuable for researchers and graduate students engaged with the development of formal methods and verification tools.
VMCAI 2004 Bernhard Steffen 2004-01-07 This book constitutes the refereed proceedings of the 5th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2004, held in Venice, Italy in January 2004. The 22 revised full papers presented together with 4 invited contributions were carefully reviewed and selected from 68 submissions. The papers are organized in topical sections on security, formal methods, model checking, software checking, liveness and completeness, and miscellaneous.
Verification, Model Checking, and Abstract Interpretation Agostino Cortesi 2003-07-31 This book constitutes the thoroughly refereed post-proceedings of the Third International Workshop on Verification, Model Checking, and Abstract Interpretation, VMCAI 2002, held in Venice, Italy in January 2002. The 22 revised full papers presented were carefully reviewed and selected from 41 submissions. The papers are organized in topical sections on security and protocols, timed systems and games, static analysis, optimization, types and verification, and temporal logics and systems.
Tools and Algorithms for the Construction and Analysis of Systems Holger Hermanns 2006-03-15 This book constitutes the refereed proceedings of the 12th International Conference on Tools and Algorithms for the Construction and Analysis of Systems, TACAS 2005, held Austria in March/April 2006 as part of ETAPS. The 30 revised full research papers and four revised tool demonstration papers presented together with one invited paper were carefully reviewed and selected from a total of 118 submissions. The papers are organized in topical sections.
Verification, Model Checking, and Abstract Interpretation Isil Dillig 2018-01-03 This book constitutes the refereed proceedings of the 19th International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2018, held in Los Angeles, CA, USA, in January 2018.The 24 full papers presented together with the abstracts of 3 invited keynotes and 1 invited tutorial were carefully reviewed and selected from 43 submissions. VMCAI provides topics including: program verification, model checking, abstract interpretation, program synthesis, static analysis, type systems, deductive methods, program certification, decision procedures, theorem proving, program certification, debugging techniques, program transformation, optimization, and hybrid and cyber-physical systems.
Handbook of Satisfiability A. Biere 2021-05-05 Propositional logic has been recognized throughout the centuries as one of the cornerstones of reasoning in philosophy and mathematics. Over time, its formalization into Boolean algebra was accompanied by the recognition that a wide range of combinatorial problems can be expressed as propositional satisfiability (SAT) problems. Because of this dual role, SAT developed into a mature, multi-faceted scientific discipline, and from the earliest days of computing a search was underway to discover how to solve SAT problems in an automated fashion. This book, the Handbook of Satisfiability, is the second, updated and revised edition of the book first published in 2009 under the same name. The handbook aims to capture the full breadth and depth of SAT and to bring together significant progress and advances in automated solving. Topics covered span practical and theoretical research on SAT and its applications and include search algorithms, heuristics, analysis of algorithms, hard instances, randomized formulae, problem encodings, industrial applications, solvers, simplifiers, tools, case studies and empirical results. SAT is interpreted in a broad sense, so as well as propositional satisfiability, there are chapters covering the domain of quantified Boolean formulae (QBF), constraints programming techniques (CSP) for word-level problems and their propositional encoding, and satisfiability modulo theories (SMT). An extensive bibliography completes each chapter. This second edition of the handbook will be of interest to researchers, graduate students, final-year undergraduates, and practitioners using or contributing to SAT, and will provide both an inspiration and a rich resource for their work. Edmund Clarke, 2007 ACM Turing Award Recipient: "SAT solving is a key technology for 21st century computer science." Donald Knuth, 1974 ACM Turing Award Recipient: "SAT is evidently a killer app, because it is key to the solution of so many other problems." Stephen Cook, 1982 ACM Turing Award Recipient: "The SAT problem is at the core of arguably the most fundamental question in computer science: What makes a problem hard?"
Principles of Abstract Interpretation Patrick Cousot 2021-09-21 Introduction to abstract interpretation, with examples of applications to the semantics, specification, verification, and static analysis of computer programs. Formal methods are mathematically rigorous techniques for the specification, development, manipulation, and verification of safe, robust, and secure software and hardware systems. Abstract interpretation is a unifying theory of formal methods that proposes a general methodology for proving the correctness of computing systems, based on their semantics. The concepts of abstract interpretation underlie such software tools as compilers, type systems, and security protocol analyzers. This book provides an introduction to the theory and practice of abstract interpretation, offering examples of applications to semantics, specification, verification, and static analysis of programming languages with emphasis on calculational design. The book covers all necessary computer science and mathematical concepts--including most of the logic, order, linear, fixpoint, and discrete mathematics frequently used in computer science--in separate chapters before they are used in the text. Each chapter offers exercises and selected solutions. Chapter topics include syntax, parsing, trace semantics, properties and their abstraction, fixpoints and their abstractions, reachability semantics, abstract domain and abstract interpreter, specification and verification, effective fixpoint approximation, relational static analysis, and symbolic static analysis. The main applications covered include program semantics, program specification and verification, program dynamic and static analysis of numerical properties and of such symbolic properties as dataflow analysis, software model checking, pointer analysis, dependency, and typing (both for forward and backward analysis), and their combinations. Principles of Abstract Interpretation is suitable for classroom use at the graduate level and as a reference for researchers and practitioners.
Verification, Model Checking, and Abstract Interpretation 2005
Verification, Model Checking, and Abstract Interpretation E. Allen Emerson 2006-02-10 The 27 revised full papers presented here, together with one invited paper were carefully reviewed and selected from 58 submissions. The papers feature current research from the communities of verification, model checking, and abstract interpretation, facilitating interaction, cross-fertilization, and advancement of hybrid methods.
Embedded Software Pa.) Emsoft 200 (2003 Philadelpha 2003-09-29 This book constitutes the refereed proceedings of the Third International Conference on Embedded Software, EMSOFT 2003, held in Philadelphia, PA, USA in October 2003. The 20 revised full papers presented together with three invited papers were carefully reviewed and selected from 60 submissions. All current topics in embedded software are addressed: formal methods and model-based development, middleware and fault tolerance, modelling and analysis, programming languages and compilers, real-time scheduling, resource-aware systems, and systems on a chip.
Verification, Model Checking, and Abstract Interpretation Fritz Henglein 2021-01-11 This book constitutes the proceedings of the 22nd International Conference on Verification, Model Checking, and Abstract Interpretation, VMCAI 2021, which was held virtually during January 17-19, 2021. The conference was planned to take place in Copenhagen, Denmark, but changed to an online event due to the COVID-19 pandemic. The 23 papers presented in this volume were carefully reviewed from 48 submissions. VMCAI provides a forum for researchers working on verification, model checking, and abstract interpretation and facilitates interaction, cross-fertilization, and advancement of hybrid methods that combine these and related areas. The papers presented in this volume were organized in the following topical sections: hyperproperties and infinite-state systems; concurrent and distributed systems; checking; synthesis and repair; applications; and decision procedures.
Verification, Model Checking, and Abstract Interpretation Kenneth McMillan 2014-01-03 This book constitutes the refereed proceedings of the 15th International Conference on Verification, Model Checking and Abstract Interpretation, VMCAI 2014, held in San Diego, CA, USA, in January 2013. The 25 revised full papers presented were carefully reviewed and selected from 64 submissions. The papers cover a wide range of topics including program verification, model checking, abstract interpretation and abstract domains, program synthesis, static analysis, type systems, deductive methods, program certification, debugging techniques, program transformation, optimization, hybrid and cyber-physical systems.
PROCEEDINGS OF THE 21ST CONFERENCE ON FORMAL METHODS IN COMPUTER-AIDED DESIGN – FMCAD 2021 Michael W. Whalen 2021-10-14 Unser Leben ist von Hardware geprägt: Sei es der USB-Stick, der Prozessor unserer Laptops oder die Sim-Karte unseres Smartphones. Doch wer sorgt eigentlich dafür, dass diese Systeme vom ersten Entwurf an stabil und sicher funktionieren? Der Computer – mithilfe des Menschen. Das Ganze nennt sich CAD (computer-aided design=computerunterstütztes Entwerfen) und ist aus der modernen Industriewelt nicht mehr wegzudenken. Doch wie lässt sich sicherstellen, dass eingesetzte Hardware und Computersysteme zuverlässig sind? Durch Formale Methoden: Das sind Techniken und Werkzeuge, mit denen man berechnet, ob etwa eine Systembeschreibung in sich konsistent ist oder Anforderungen richtig entworfen und implementiert wurden. Anders gesagt: Man kann damit die Sicherheit von Hardware und Software überprüfen. Wie das konkret aussehen kann, interessiert auch die jährlich stattfindende Konferenz „Formal Methods in Computer-Aided Design (FMCAD)“. Unter der Leitung von Ruzica Piskac und Michael W. Whalen beschäftigte sich die 21. Tagung im Oktober 2021 mit den neuesten Forschungsergebnissen im Bereich der Formalen Methoden. Zu dieser Online-Tagung ist nun auch ein Konferenzband mit über 30 Beiträgen erschienen, die ein breites Spektrum der Formalen Methoden abdecken: angefangen bei der Verifikation von Hardware, nebenläufigen und verteilten Systemen und neuronalen Netzen bis hin zu maschinellem Lernen und Entscheidungsprozeduren. Der Band gewährt einen spannenden Einblick in bahnbrechende Methoden, Technologien, theoretische Ergebnisse und Werkzeuge für Formale Logik in Rechensystemen und Systementwicklungen.