Program Analysis And Specialization For The C Programming

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ASHLEY LILLIANNA

ECOOP '99 - Object-Oriented Programming
Springer
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.
Logic-Based Program Synthesis and Transformation John Wiley & Sons
This book constitutes the refereed proceedings of the 8th International Symposium on Static Analysis, SAS 2001, held in Paris, France, in July 2001. The 21 revised full papers presented together with 2 invited papers were carefully reviewed and selected from 62 submissions; also included are 5 abstracts of an invited session on security. The papers are organized in topical sections on program transformation, strictness and termination, semantics abstraction, logic and constraint programming, data structures, pointer analysis, model checking, and abstract model checking.
Rapport Springer Science & Business Media
This volume constitutes the proceedings of the 6th International Symposium on Programming Language Implementation and Logic Programming (PLILP '94), held in Madrid, Spain in September 1994. The volume contains 27 full research papers selected from 67 submissions as well as abstracts of full versions of 3 invited talks by renowned researchers and abstracts of 11

system demonstrations and poster presentations. Among the topics covered are parallelism and concurrency; implementation techniques; partial evaluation, synthesis, and language issues; constraint programming; meta-programming and program transformation; functional-logic programming; and program analysis and abstract interpretation.

Formal Methods and Models for System Design Springer Science & Business Media

\My tailor is Object-Oriented". Most software systems that have been built - cently are claimed to be Object-Oriented. Even older software systems that are still in commercial use have been upgraded with some OO ?avors. The range of areas where OO can be viewed as a \must-have" feature seems to be as large as the number of elds in computer science. If we stick to one of the original views of OO, that is, to create cost-e ective software solutions through modeling ph- ical abstractions, the application of OO to any eld of computer science does indeed make sense. There are OO programming languages, OO operating s- tems, OO databases, OO speci cations, OO methodologies, etc. So what does a conference on Object-Oriented Programming really mean? I honestly don't know. What I do know is that, since its creation in 1987, ECOOP has been attracting a large number of contributions, and ECOOP conferences have ended up with high-quality technical programs, featuring interesting mixtures of theory and practice. Among the 183 initial submissions to ECOOP'99, 20 papers were selected for inclusion in the technical program of the conference. Every paper was reviewed by three to ve referees. The selection of papers was carried out during a t- day program committee meeting at the Swiss Federal Institute of Technology in Lausanne. Papers were judged according to their originality, presentation qu- ity, and relevance to the conference topics.

The Essence of Computation Springer Science & Business Media

This book constitutes the refereed proceedings of the Second Symposium on Programs as Data Objects, PADO 2001, held in Aarhus, Denmark, in May 2001. The 14 revised full papers presented were carefully reviewed and selected from 30 submissions. Various aspects of looking at programs as data objects are covered from the point of view of program analysis, program transformation, computational complexity, etc.

Program Analysis and Specialization for the C Programming Language Springer

Program specialization or partial evaluation is a proven program optimization technique dating back to the early seventies. One common flavor of program specialization is offline partial evaluation. It employs a program analysis to determine what operations can be reduced at specialization time. Historically, offline systems used simple binding-time annotation techniques, or considered simply-typed programming languages. These approaches have hampered offline methods in reaching their full potential. In this thesis, we aim to address these limitations. We describe the development of a new and entirely operational theory for offline polymorphic specialization

of ML-like languages by combining techniques from dynamic memory management with program specialization. Our approach is based on the region calculus of Tofte and Talpin, a polymorphically typed lambda calculus with annotations that make memory allocation and deallocation explicit. The formal correctness proof of our novel specialization technique based on a region type system requires two theoretical building blocks: a type soundness proof for the region calculus and a correctly proven equational theory between region-annotated terms. Putting these together yields a new method for offline partial evaluation of functional programming languages with an ML-style typing discipline. Our method comprises a polymorphic binding-time analysis with polymorphic recursion, which is conceived as a constraint analysis on top of region inference. The relation between program specialization and regions is a result of regarding binding times as properties of regions.

Practical Aspects of Declarative Languages Springer Nature

This book constitutes the thoroughly refereed post-proceedings of the 20th International Symposium on Logic-Based Program Synthesis and Transformation, LOPSTR 2010, held in Hagenberg, Austria in July 2010. The 13 revised full papers presented together with two invited papers were carefully reviewed and selected from 26 submissions. Among the topics covered are specification, synthesis, verification, analysis, optimization, specialization, security, certification, application and tools, program/model manipulation, and transformation techniques for any programming language paradigm.

Programming Language Implementation and Logic Programming Springer

This book constitutes the refereed proceedings of the 11th International Conference on System Analysis and Modeling, SAM 2019, held in Munich, Germany, in September 2019. The 12 full papers and 2 work in progress papers presented together with one keynote talk were carefully reviewed and selected from 28 submissions. The papers discuss the most recent innovations, trends, and experiences in modeling and analysis of complex systems using ITU-T's Specification and Description Language (SDL-2010) and Message Sequence Chart (MSC) notations, as well as related system design languages — including UML, ASN.1, TTCN, SysML, and the User Requirements Notation (URN). SAM 2019's theme was "Languages, Methods, and Tools for Industry 4.0."

Programming Analysis - Simple Steps to Win, Insights and Opportunities for Maxing Out Success IOS Press

1 The tenth anniversary of the LOPSTR symposium provided the incentive for this volume. LOPSTR started in 1991 as a workshop on logic program synthesis and transformation, but later it broadened its scope to logic-based program development in general, that is, program development in computational logic, and hence the title of this volume. The motivating force behind LOPSTR has been the belief that declarative paradigms such as logic programming are better suited to program development tasks than traditional non-declarative ones such as the imperative paradigm.

Speci?cation, synthesis, transformation or specialization, analysis, debugging and veri?cation can all be given logical foundations, thus providing a unifying framework for the whole development process. In the past 10 years or so, such a theoretical framework has indeed begun to emerge. Even tools have been implemented for analysis, veri?cation and speci- ization. However,itisfairtosaythats ofarthefocushaslargelybee nonprogrammi- in-the-small. So the future challenge is to apply or extend these techniques to programming-in-the-large, in order to tackle software engineering in the real world. Returning to this volume, our aim is to present a collection of papers that re?ect signi?cant research e?orts over the past 10 years. These papers cover the wholedevelopmentproces s:speci?cation,synthesis,a nalysis,transformationand specialization, as well as semantics and systems.

Program Analysis and Compilation Techniques for Speeding Up Transactional Database Workloads Springer Science & Business Media Perhaps nothing characterizes the inherent heterogeneity in embedded sys tems than the ability to choose between hardware and software implementations of a given system function. Indeed, most embedded systems at their core repre sent a careful division and design of hardware and software parts of the system To do this task effectively, models and methods are necessary functionality. to capture application behavior, needs and system implementation constraints. Formal modeling can be valuable in addressing these tasks. As with most engineering domains, co-design practice defines the state of the it seeks to add new capabilities in system conceptualization, mod art, though eling, optimization and implementation. These advances -particularly those related to synthesis and verification tasks - direct1y depend upon formal under standing of system behavior and performance measures. Current practice in system modeling relies upon exploiting high-level programming frameworks, such as SystemC, EsterelI, to capture design at increasingly higher levels of ab straction and attempts to reduce the system implementation task. While raising the abstraction levels for design and verification tasks, to be really useful, these approaches must also provide for reuse, adaptation of the existing intellectual property (IP) blocks.

Static Analysis Springer Science & Business Media This book constitutes the thoroughly refereed proceedings of the 21st International Symposium on Logic-Based Program Synthesis and Transformation, LOPSTR 2011, held in Odense, Denmark in July 2011. The 6 revised full papers presented together with 8 additional papers were carefully reviewed and selected from 28 submissions. Among the topics covered are specification, synthesis, verification, analysis, optimization, specialization, security, certification, applications and tools, program/model manipulation, and transformation techniques for any programming language paradigm.

Logic-Based Program Synthesis and Transformation Springer Science & Business Media This book constitutes the refereed proceedings of

the 13th International Symposium on Static Analysis, SAS 2006. The book presents 23 revised full papers together with the abstracts of 3 invited talks. The papers address all aspects of static analysis including program and systems verification, shape analysis and logic, termination analysis, bug detection, compiler optimization, software maintenance, security and safety, abstract interpretation and algorithms, abstract domain and data structures and more.

Tools and Methods of Program Analysis Springer

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Program Development in Computational Logic Springer Science & Business Media

Mots-clés de l'auteur: transaction processing ; program analysis ; compilation techniques ; transaction repair ; generative programming ; program optimization ; functional programming ; compiler ; staging ; data structure specialization.

Compiler Construction Pearson Education

Program analysis utilizes static techniques for computing reliable information about the dynamic behavior of programs. Applications include compilers (for code improvement), software validation (for detecting errors) and transformations between data representation (for solving problems such as Y2K). This book is unique in providing an overview of the four major approaches to program analysis: data flow analysis, constraint-based analysis, abstract interpretation, and type and effect systems. The presentation illustrates the extensive similarities between the approaches, helping readers to choose the best one to utilize.

Perspectives of System Informatics Springer

This book constitutes the refereed proceedings of the 7th International Static Analysis Symposium, SAS 2000, held in Santa Barbara, CA, USA, in June/July 2000. The 20 revised full papers presented were carefully reviewed and selected from 52 submissions. Also included are 2 invited full papers. All current aspects of high-performance implementation and verification of programming languages are addressed, in particular object logics, model checking, constraint solving, abstract interpretation, program transformation, rewriting, confidentiality analysis, typed languages, unified analysis, code optimization, termination, code specialization, and guided abstraction.

Static Analysis Springer Nature

The one-stop-source powering Programming Analysis success, jam-packed with ready to use insights for success, loaded with all the data you need to decide how to gain and move ahead. An one-of-a-kind book, based on extensive research, this reveals the best practices of the most successful Programming Analysis knowledge

mavens, those who are adept at continually innovating and seeing opportunity where others do not. This is the first place to go for Programming Analysis innovation, in today's knowledge-driven business environment, professionals face particular challenges as their purpose is to discover or develop new concepts, products, or processes; the pressure to perform is intense. This title is the entryway to a single source for innovation. BONUS: Included with the book come numerous real-world Programming Analysis blueprints, presentations and templates ready for you to download and use. This book addresses the crucial issue of Programming Analysis adoption by presenting the facts to move beyond general observation. The model underpinning this book has been used as a predictive decision tool, tracking thousands of innovations for over more than a decade. And...this all-encompassing analysis focuses on key areas of future Programming Analysis growth.

Practical Aspects of Declarative Languages
Springer Science & Business Media
Analyzing standard safety properties of a given program has traditionally been the primary focus of the program analysis community. Unfortunately, there are still many interesting analysis tasks that cannot be effectively expressed with standard safety properties. One such example is to derive the asymptotic complexity of a given program. Another example is to verify relational properties, i.e. properties that must be satisfied jointly by multiple programs of multiple runs of one program. Existing program analysis techniques for standard safety properties are usually not immediately applicable to asymptotic complexity analysis problems and relational verification problems. New approaches are therefore needed to solve these unconventional problems. This thesis studies techniques for algorithmic complexity analysis as well as relational verification. To that end, we present three case studies: (1) We propose a new fuzzing technique for automatically finding inputs that trigger a program's worst-case resource usage. (2) We show how to build a scalable, end-to-end side channel detection tool by combining static taint analysis and a program logic designed for verifying non-interference of a given program. (3) We propose a general and effective relational verification algorithm that combines reinforcement learning with backtracking search. A common theme among all these solutions is to exploit problem-specific structures and adapt existing techniques to exploit those structures accordingly

Proceedings of the ... ACM SIGPLAN--SIGSOFT Workshop on Program Analysis for Software Tools and Engineering
Springer Nature
This book constitutes the refereed proceedings of the 13th International Conference on Compiler Construction, CC 2004, held in Barcelona, Spain, in March/April 2004. The 19 revised full papers presented together with the abstract of an invited talk were carefully reviewed and selected from 58 submissions. The papers are organized in topical sections on program analysis, parsing, loop analysis, optimization, code generation and backend

optimizations, and compiler construction. *Proceedings of the ACM Twentieth Annual Southeast Regional Conference* Springer By presenting state-of-the-art aspects of the theory of computation, this book commemorates the 60th birthday of Neil D. Jones, whose scientific career parallels the evolution of computation theory itself. The 20 reviewed research papers presented together with a brief survey of the work of Neil D. Jones were written by scientists who have worked with him, in the roles of student, colleague, and, in one case, mentor. In accordance with the Festschrift's subtitle, the papers are organized in parts on computational complexity, program analysis, and program transformation.

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