Lecture Notes in Computer Science 4501

Commenced Publication in 1973
Founding and Former Series Editors:
Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

João Marques-Silva Karem A. Sakallah (Eds.)

Theory and Applications of Satisfiability Testing – SAT 2007

10th International Conference
Lisbon, Portugal, May 28-31, 2007
Proceedings

Springer

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Library of Congress Control Number: 2007927094

CR Subject Classification (1998): F.4.1, I.2.3, I.2.8, I.2, F.2.2, G.1.6

LNCS Sublibrary: SL 1 – Theoretical Computer Science and General Issues

ISSN 0302-9743
ISBN-10 3-540-72787-6 Springer Berlin Heidelberg New York
ISBN-13 978-3-540-72787-3 Springer Berlin Heidelberg New York

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India
Printed on acid-free paper SPIN: 12069392 06/3180 5 4 3 2 1 0

Preface

This volume contains the papers presented at SAT 2007: 10th International Conference on Theory and Applications of Satisfiability Testing.

The International Conferences on Theory and Applications of Satisfiability Testing (SAT) originated in 1996 as a series of workshops "on Satisfiability." By the third meeting in 2000, the workshop had attracted a mix of theorists and experimentalists whose common interest was the enhancement of our basic understanding of the theoretical underpinnings of the Satisfiability problem as well as the development of scalable algorithms for its solution in a wide range of application domains. In 2002 a competition of SAT solvers was inaugurated to spur further algorithmic and implementation developments, and to create an eclectic collection of benchmarks. The competition—expanded in subsequent years to include pseudo Boolean, QBF, and MAX-SAT solvers—has become an integral part of these meetings, adding an element of excitement and anticipation. The interplay between theory and application, as well as the increased interest in Satisfiability from a wider community of researchers, led to the natural evolution of these initial workshops into the current conference format. The annual SAT conference is now universally recognized as "the venue" for publishing the latest advances in SAT research.

This year marks the tenth SAT meeting. SAT is now interpreted in a broad sense to include not just propositional satisfiability, but also pseudo-Boolean constraint solving and optimization (PB), quantified Boolean formulae (QBF), constraint programming techniques (CP) for word-level problems and their propositional encoding, and satisfiability modulo theories (SMT). Submissions were solicited for original research on proof systems and proof complexity, search algorithms and heuristics, analysis of algorithms, hard instances, randomized formulae, problem encodings, industrial applications, solvers, simplifiers and tools, case studies and empirical results. A total of 74 submissions were received and rigorously reviewed by a 35-member international Technical Program Committee (TPC), with each paper receiving at least four independent reviews. Of these submissions, the TPC decided to accept 22 as regular papers (14 pages, 25-minute presentation) and 12 as short papers (6 pages, 12-minute presentation). The accepted papers were organized into nine sessions and their full text is included in these proceedings.

The conference program also featured two invited presentations. The first, by Martin Davis, chronicled the original development of the "DPLL" algorithm and proposed an unorthodox take on the P=NP problem. The second, by Andrei Voronkov, addressed new encodings that enable succinct representations of certain combinatorial problems in the Bernays – Schonfinkel fragment of first-order logic.

A number of additional events were associated with the SAT conference, including the SAT competition, the QBF evaluation, the PB evaluation, the MAX-SAT evaluation, and a special session on trends in modern SAT solvers.

We would like to acknowledge several people for their help: the SAT Local Chair, Ines Lynce; the organizers of the SAT competition, Daniel Le Berre, Laurent Simon, Ewald Speckenmeyer, Geoff Sutcliffe and Lintao Zhang; the organizers of the QBF evaluation, Massimo Narizzano, Luca Pulina and Armando Tacchella; the organizers of the PB evaluation, Vasco Manquinho and Olivier Roussel; and finally the organizers of the Max-SAT evaluation, Josep Argelich, Chu-Min Li, Felip Manyà and Jordi Planes. Last, but not least, we thank the Program Committee and the additional external reviewers for their careful and thorough work, without which it would not have been possible for us to put together such a high-quality conference program.

We also thank Andrei Voronkov for the EasyChair system. EasyChair was instrumental in handling of paper submissions, paper reviewing, paper discussion, and assembly of the proceedings. Finally, we would like to thank the following sponsors for their generous support of SAT 2007: Cadence Design Systems, Cornell's Intelligent Information Systems Institute, Intel Corporation, Luso-American Foundation, Magma Design Automation, Microsoft Corporation, NEC Laboratories, and Synopsys Inc. A number of other institutions provided critical logistical support for managing the organization of the conference: INESC-ID, Instituto Superior Técnico, the University of Michigan, and the University of Southampton.

May 2007

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