



SAT Race 2015

Tomáš Balyo, Markus Iser, Carsten Sinz | September 22, 2015

SAT 2015 - 18TH INTERNATIONAL CONFERENCE ON THEORY AND APPLICATIONS OF SATISFIABILITY TESTING



What is a SAT Race?

- Competition of Boolean Satisfiability (SAT) solvers
- Purpose: "The purpose of the competition is to identify new challenging benchmarks and to promote new solvers for the propositional satisfiability problem (SAT) as well as to compare them with state-of-the-art solvers."
- Long tradition
 - First Sat Competition in 2002
 - 9 Sat Competitions
 - 3 Sat Races
 - 1 Sat Challenge

- Main (Sequential) Track (28 solvers)
 - 300 "application" benchmarks
(133 from the 2014 SAT Competition, 167 new)
 - 1h time limit, 5 runs
- Parallel Track (11 solvers)
 - 100 benchmarks (the hardest 100 from the Main Track)
 - 1h time limit
 - 64 CPU cores, 512GB Ram
- Introducing - Incremental Library Track (8+1 solvers)
 - solvers implement a "C" language API (IPASIR)
 - benchmarks are SAT solving based applications

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- IPASIR = Re-entrant Incremental Satisfiability Application Program Interface (acronym reversed)
- IPASIR has 6 methods for SAT solving:
 - add clauses and assumptions (2 methods)
 - set callback for abort
 - solve
 - get model and failed assumptions (2 methods)

- Partial MaxSat Solving (linear strengthening of a cardinality constraint on soft clauses), 568 pMaxSat problems (industrial track, MaxSat 2014)
- Trivial parallel portfolio SAT solver (clause order diversification), the 100 problems of the parallel track
- Finding all essential (has to be assigned in each satisfying assignment) variables, 50 easiest instances of the main track
- Incremental SAT file interpreter, 50 files generated from HWMCC 2014 instances, 3979 SAT calls in total
 - submitted by Florian Lonsing, Johannes Oetsch, and Uwe Egly

Incremental Library Track – Results

solver name	essent.	pmax	is-file	pfolio	total
#instances	50	568	3979	100	4697
CryptoMiniSat4	48	266	1454	0	1768
CryptoMiniSat4autotune	47	271	1452	0	1770
CoMiniSatPs1Earth	45	244	1406	12	1707
CoMiniSatPs1Sun	45	250	1434	5	1734
Glucose4	48	259	1407	1	1715
Riss505	44	234	1372	4	1654
Riss504	44	244	1370	2	1660
PicoSat961	44	165	1285	5	1499
SatUZK	43	204	842	5	1094

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- 3rd Prize: **Glucose4** by **Gilles Audemard** and **Laurent Simon**

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- 1st Prize: **CryptoMiniSat4** by **Máté Soós**
- 1st Prize: **CoMiniSatPs1** by **Chanseok Oh**
- 3rd Prize: **Glucose4** by **Gilles Audemard** and **Laurent Simon**

Parallel Track – Results

- 1st Prize:
- 2nd Prize:
- 3rd Prize:

Parallel Track – Results

- 1st Prize:
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- 1st Prize:
- 2nd Prize: **Plingeling sr15bal** by **Armin Biere** (73 solved)
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- 1st Prize: **Glucose Syrup Adapt 4** by **Gilles Audemard** and **Laurent Simon** (78 solved)
- 2nd Prize: **Plingeling sr15bal** by **Armin Biere** (73 solved)
- 3rd Prize: **Treengeling sr15bal** by **Armin Biere** (73 solved)

Main Track – Results

- 1st Prize:
- 2nd Prize:
- 3rd Prize:

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- 2nd Prize:
- 3rd Prize: **Riss v5.05** (blackbox) by **Lucas Kahlert, Franziska Krüger, Norbert Manthey and Aaron Stephan** (249.4 solved)

- 1st Prize:
- 2nd Prize: **MiniSatBCD** by **Jingchao Chen** (256.4 solved)
- 3rd Prize: **Riss v5.05** (blackbox) by **Lucas Kahlert, Franziska Krüger, Norbert Manthey and Aaron Stephan** (249.4 solved)

- 1st Prize: **abcdSAT** by **Jingchao Chen** (261 solved)
- 2nd Prize: **MiniSatBCD** by **Jingchao Chen** (256.4 solved)
- 3rd Prize: **Riss v5.05** (blackbox) by **Lucas Kahlert, Franziska Krüger, Norbert Manthey and Aaron Stephan** (249.4 solved)

- Special Prize – Most "Innovative" Solver
 - Based on instances not solved by the 1st, 2nd, and 3rd solver
 - 4 points for each benchmark not solved by any of the winners
 - 2 points for each benchmark solved by only one of the winners
 - 1 point for each benchmark solved by only two of the winners
- Winner is:

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 - 1 point for each benchmark solved by only two of the winners
- Winner is: **Lingeling sr15bal** by **Armin Biere** (38 points)

Acknowledgments

- Thanks to all the participants
- Thanks for all the benchmarks
- Thanks to Aaron Stump and StarExec

- Thank You for Your attention