The Results of SAT Competition 2016

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What is a SAT Competition?

- **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
  - 4 SAT Races
  - 1 SAT Challenge
What is New This Year

- We have two new tracks
  - Agile Track – in favor of solvers with small overhead
    large number (thousands) of easy benchmarks
    small time limit (1 minute)
  - NoLimit Track – remove all limitations
    solvers do not need to print model or produce proof,
    authors do not have to provide source code, portfolios are allowed,
    only brand new benchmarks are used
- Binary DRAT proof format introduced
  - proofs take up less space
Tracks part 1

- **Main (Sequential) Track (29 solvers)**
  - 300 “application” and 200 “crafted” benchmarks
  - 5,000 sec limit for solving and 20,000 sec for proof checking
  - Solvers run on a single core
  - UNSAT proof logging required

- **Parallel Track (13 solvers)**
  - The same benchmark suite as the Main Track (application + crafted)
  - 5,000 sec limit for solving
  - 24 (48) CPU cores (hyper-threading), 64GB RAM

- **Random Satisfiable Track (9 solvers)**
  - 240 random satisfiable benchmarks
  - 5,000 sec limit for solving
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Tracks part 2

- Incremental Library Track (8 solvers)
  - benchmarks are SAT based applications (PMaxSAT, Essentials, HWMCC), we used same applications but with different inputs
  - average rank for each application determines winner
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- Introducing Agile Track (30 solvers)
  - 5,000 benchmarks, all coming from SMT solving
  - 60 sec limit for solving
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- Introducing Agile Track (30 solvers)
  - 5,000 benchmarks, all coming from SMT solving
  - 60 sec limit for solving

- Introducing No-Limit Track (21 solvers)
  - 350 brand new benchmarks (subset of the Main Track benchmarks)
  - 5,000 sec limit for solving
  - Most of the solvers provided source codes and models, but not all
Random Track – Results

The Winners of the Random Track are:

1st Prize:
Dimetheus
by Oliver Gableske

2nd Prize:
CSCCSat
by Chuan Luo, Shaowei Cai, Wei Wu, Kaile Su

3rd Prize:
DCCAlm
by Chuan Luo, Shaowei Cai, Kaile Su
The Winners of the Random Track are:

- **1st Prize:** Dimetheus (95 solved) by Oliver Gableske
- **2nd Prize:** CSCCSat (89 solved) by Chuan Luo, Shaowei Cai, Wei Wu, Kaile Su
- **3rd Prize:** DCCAIm (88 solved) by Chuan Luo, Shaowei Cai, Kaile Su
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The Winners of the Incremental Track are:

1st Prize: CryptoMiniSat (avg. rank 2.0) by Mate Soos
2nd Prize: Glucose (avg. rank 2.3) by Gilles Audemard and Laurent Simon
3rd Prize: Riss (avg. rank 3.0) by Norbert Manthey, Aaron Stephan and Elias Werner
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The Winners of the Parallel Track are:

1st Prize: Treengeling (315 solved) by Armin Biere
2nd Prize: Plingeling (302 solved) by Armin Biere
3rd Prize: CryptoMiniSat (297 solved) by Mate Soos
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1st Prize: Riss (3284 solved) by Norbert Manthey, Aaron Stephan and Elias Werner

2nd Prize: TB Glucose (3187 solved) by Seongsoo Moon and Inaba Mary

3rd Prize: CHBR Glucose (3179 solved) by Seongsoo Moon and Inaba Mary
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Main Track – Special Prizes

The best Application/Crafted benchmark solvers and best Glucose Hack:

Best Application Benchmark Solver:
MapleCOMSPS
by Jia Hui Liang, Chanseok Oh, Vijay Ganesh, Krzysztof Czarnecki

Best Crafted Benchmark Solver:
TC Glucose
by Seongsoo Moon and Inaba Mary

Best Glucose Hack:
Kiel (4th place overall)
by Thorsten Ehlers and Dirk Nowotka
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The best Application/Crafted benchmark solvers and best Glucose Hack:

- Best Application Benchmark Solver: MapleCOMSPS (154 solved) by Jia Hui Liang, Chanseok Oh, Vijay Ganesh, Krzysztof Czarnecki and Pascal Poupart
The best Application/Crafted benchmark solvers and best Glucose Hack:

- **Best Application Benchmark Solver:** MapleCOMSPS (154 solved) by Jia Hui Liang, Chanseok Oh, Vijay Ganesh, Krzysztof Czarnecki and Pascal Poupart

- **Best Crafted Benchmark Solver:** TC_Glucose (58 solved) by Seongsoo Moon and Inaba Mary
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More information and Acknowledgments

Additionals Information

- The Competition Proceedings (solver and benchmark descriptions) can be found on the conference USB stick
- For the detailed competition results see the Sat Competition website

Acknowledgments

- Thanks to all the participants
- Thanks for all the benchmarks
- Thanks to Aaron Stump and StarExec
- Thanks to TACC for the Lonestar5 resources
- Thank You for Your attention