Max-SAT Evaluation 2013

Eighth Edition

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SAT 2013
July 8th–12th, Helsinki, Finland

Outline

Outline

What's new this year

More memory 3.5 GB (New hardware)

More solvers 19 new solvers

Complete solvers: 32 successful submissions (16 new)
Incomplete solvers: 5 submissions (3 new)

More benchmarks 2946 instances (366 new)

Evaluation Environment

Cluster specification

Complete solvers:

Name	UPJV – MeCS – UV100
Operating System	SUSE Linux Enterprise Server 11, Linux 2.6.32
Processor	Intel Xeon E7–8837, 2.67GHz
Memory	3.5 GB
Compilers	GCC 4.3.4, javac J2RE 2.3

Incomplete solvers:

Name	UdL – AM
Operating System	Rocks Cluster 6.1, Linux 2.6.32
Processor	Intel Xeon E5–2620, 2 GHz
Memory	3.5 GB
Compilers	GCC 4.4.6, javac 1.7.0

Evaluation Environment

Resources:

- 3.5 GB of memory
- Timeout of

Complete	1800 seconds
Incomplete	300 seconds

Ranking:

1. Number of solved instances
2. Time needed to solve those instances

Categories

- Max-SAT (600 instances)
  - All soft clauses
  - Unary weights
- Weighted Max-SAT (276 instances)
  - All soft clauses
  - Integer positive weights
- Partial Max-SAT (1214 instances) (238 new)
  - Hard and soft clauses
  - Unary weights
- Weighted Partial Max-SAT (856 instances) (128 new)
  - Hard and soft clauses
  - Integer positive weights

New benchmarks

- Coalition Structure Generation (M. Koshimura) : Weighted Partial / Crafted
- packup: Package Upgradability problem (A. Ignatiev, R. Martins, M. Janota): Partial / Industrial, Weighted Partial / Industrial
- TPR: Encoding of ITC99 – Test Synthesis (M. Sauer, S. Reimer, T. Schubert): Partial / Industrial
- DES: Discrete-event system diagnosis (Anbulagan, A. Grastien) : Partial / Industrial
- Preference-based Planning (F. Juma, E. I. Hsu, S. A. McIlraith) : Weighted Partial / Industrial
- Close Solutions: Finding Solutions Close to a Given One (I. Abío, P. J. Stuckey) : Partial / Industrial

New solvers
Complete

New complete solvers in the top-three:

CKmax-small (C. Komaki) a UP-based Max-SAT solver.

ILP (C. Ansotegui, M. Bonet, J. Gabas, J. Levy) Max-SAT frontend for CPLEX.

ISAC+ (C. Ansótegui, J. Gabàs, Y. Malitsky, M. Sellmann) Max-SAT frontend for portfolio solver ISAC.

MaxHS (J. Davies, F. Bacchus) Hybrid approach between a SAT solver and a MIP solver.

MiFuMaX (M. Janota) Unsat-based solver.

MSUnCore (J. Marques-Silva, A. Morgado, F. Heras) Unsat-based solver.

SCIP-maxsat (M. Sakai) Max-SAT frontend for solver SCIP, a MIP solver.

Rest of new complete solvers:

Antom, glpk-maxsat, optimax, Toulbar2, toysat

New solvers
Incomplete

New incomplete solvers:

CCLS (C. Luo, S. Cai, Z. Jie, K. Su) Configuration Checking, a diversification strategy to avoid revisiting a candidate solution.

iraNovelty++ (A. Abramé, D. Habet)

optimax (P. Steinke, N. Manthey) Core guided MaxSAT solver based on BCD2 algorithm with a modified glucose SAT solver.

Outline

Results for Complete Solvers

Third positions:

	MaxSAT	Weighted	Partial	W. Partial
Random	WMaxSatz09	ckmax–small	WMaxSatz09	WMaxSatz09
Crafted	WMaxSatz09	WMaxSatz+	ILP	ILP
Industrial	WPM1	—	MSUnCore	wMiFuMax

Results for Complete Solvers

Second positions:

	MaxSAT	Weighted	Partial	W. Partial
Random	ISAC+ WMaxSatz09	Maxsatz2013f ckmax–small	WMaxSatz+ WMaxSatz09	ISAC+ WMaxSatz09
Crafted	Maxsatz2013f WMaxSatz09	Maxsatz2013f WMaxSatz+	SCIP-maxsat ILP	ISAC+ ILP
Industrial	ISAC+ WPM1	— —	QMaxSAT2-mt MSUnCore	WPM1-2013 wMiFuMax

Results for Complete Solvers

Winners:

	MaxSAT	Weighted	Partial	W. Partial
Random	MaxSatz2013f	ISAC+	ISAC+	Maxsatz2013f
	ISAC+	Maxsatz2013f	WMaxSatz+	ISAC+
	WMaxSatz09	ckmax–small	WMaxSatz09	WMaxSatz09
Crafted	ISAC+	ISAC+	ISAC+	MaxHS
	Maxsatz2013f	Maxsatz2013f	SCIP-maxsat	ISAC+
	WMaxSatz09	WMaxSatz+	ILP	ILP
Industrial	pMiFuMax	—	ISAC+	ISAC+
	ISAC+	—	QMaxSAT2-mt	WPM1-2013
	WPM1	—	MSUnCore	wMiFuMax

Results for Incomplete Solvers

Third positions:

	MaxSAT	Weighted	Partial	W. Partial
Random	SAT4J	N/A	N/A	N/A
Crafted	optimax-it	optimax-it	SAT4Jms	SAT4Jms
Industrial	SAT4J	—	SAT4Jms	SAT4Jms

Results for Incomplete Solvers

Second positions:

	MaxSAT	Weighted	Partial	W. Partial
Random				
	iraNovelty++	iraNovelty++	N/A	N/A
	SAT4J	N/A	N/A	N/A
Crafted				
	iraNovelty++	iraNovelty++	SAT4Jms	SAT4Jms
	optimax-it	optimax-it	SAT4Jms	SAT4Jms
Industrial				
	CCLS	—	SAT4Jms	SAT4Jms
	SAT4J	—	SAT4Jms	SAT4Jms

Results for Incomplete Solvers

Winners:

	MaxSAT	Weighted	Partial	W. Partial
Random	CCLS	CCLS	optimax-it	optimax-it
	iraNovelty++	iraNovelty++	N/A	N/A
	SAT4J	N/A	N/A	N/A
Crafted	CCLS	CCLS	optimax-it	optimax-it
	iraNovelty++	iraNovelty++	SAT4Jms	SAT4Jms
	optimax-it	optimax-it	SAT4Jms	SAT4Jms
Industrial	optimax-it	—	optimax-it	optimax-it
	CCLS	—	SAT4Jms	SAT4Jms
	SAT4J	—	SAT4Jms	SAT4Jms

Outline

Poster

- All ranking tables (top-3) with time and number of solved instances.
- Cactus plots for complete solvers.

Web page

- Max-SAT Evaluation 2013 web page
  - `http://maxsat.ia.udl.cat/`
- Tables with mean times and number of solved instances
- Tables with percentages of solved instances for each set
- Complete ranking tables
- All the cactus plots
- Detailed results for each set of instances
- Description of the solvers and benchmarks.

Thanks

Thanks to the people that contributed solvers and benchmarks, and to the Université de Picardie Jules Verne and Universitat de Lleida for allowing us to use their clusters.

We encourage you to participate in the

Max-SAT Evaluation 2014!