System Description: MathSAT 5-smtcomp12

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MathSAT 5 is a lazy SMT solver based on the DPLL(T) architecture. It is the successor of the MathSAT 4 SMT solver. A great portion of the system has been reimplemented (still in C++) in order to address some limitations in the architecture of MathSAT 4 and to make the implementation more modular and maintainable. MathSAT 5 supports a more general and flexible type system than its predecessors, which should greatly simplify the integration of more theories and functionalities. Moreover, particular attention has been put in the interoperability among the various extended functionalities (like e.g. incremental usage, proof generation, unsat core extraction, interpolation, All-SMT) that the solver provides and in their compatiblity with the preprocessor and search-time optimizations implemented. One of the main weak points of MathSAT 4 is that many of its advanced techniques for search-space reduction are incompatible with the extended functionalities that it provides: the long-term goal of MathSAT 5 is that of removing this limitation completely.

The version participating in SMT-COMP'12 is a minor update of the version participating in SMT-COMP'11, mostly consisting of bug fixes. The most important novel functionality is the support for the generation of unsatisfiable cores using an external Boolean MUS extractor, as described in [1]. In particular, for the SMT-COMP'12 unsat core track, MathSAT uses the Muser2 Boolean MUS extractor [2], developed by Anton Belov and Joao Marques-Silva. More information about Muser2 can be found at http://logos.ucd.ie/wiki/doku.php?id=muser.

MathSAT 5 will participate in the main, application and unsat core tracks, entering the following categories:

Main track: QF_BV, QF_AUFBV, QF_UFLRA, QF_UFLIA.

Application track: QF_LRA, QF_LIA, QF_UFLIA, QF_BV, QF_AUFLIA

Unsat core track: QF_LRA, QF_LIA, QF_BV

The only difference between the three submissions is in the configuration file used for setting the parameters of the solver.

Magic Number: 512

Acknowledgements. We thank Anton Belov for providing us with the Muser2 Boolean MUS extractor used in the unsat core track.

References

[1] A. Cimatti, A. Griggio, R. Sebastiani. Computing Small Unsatisfiable Cores in Satisfiability Modulo Theories. J. Artif. Intell. Res. (JAIR) 40: 701-728 (2011).

[2] A., J. Marques-Silva: Accelerating MUS Extraction with Recursive Model Rotation. FMCAD 2011.