

Yices 2 in SMT-COMP 2023

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1 Introduction

Yices 2 [3] is an open-source (GPLv3) SMT solver developed and distributed by SRI International. It can be download at <http://yices.cs1.sri.com> and on our GitHub repository at <https://github.com/SRI-CSL/yices2>. The solver supports linear and non-linear arithmetic, bit-vectors, uninterpreted functions, and arrays.

Yices 2 uses the standard CDCL(T) [8] architecture and a variant of the Nelson-Oppen method for combining decision procedures. Details are presented in [3]. The solver also includes a Model-Construction Satisfiability Calculus (MCSAT) [2, 7, 6] implementation. By default, MCSAT is used for all theories that require non-linear arithmetic and CDCL(T) is used for everything else. Quantifier reasoning is supported for the UF theory, via E-graph matching and model-based instantiation. Yices 2 can use third-party backend SAT solvers for bitvector solving. Currently, it supports three SAT solvers: CaDiCaL [5], CryptoMiniSat [9], and Kissat [5].

What's new? The latest version of Yices 2 includes support for the theory of arrays in the MCSAT implementation and is based on the weakly-equivalent arrays [1] decision procedure. Additionally, the variable decision and clause scoring heuristics in MCSAT have been updated, partly inspired from the values used in the MiniSat [4] SAT solver.

2 Competition Version

In the SMT competition 2023, we are participating with the most recent development version of Yices 2. This version is entering in all the logics and divisions it supports, including the incremental, model-validation, and unsat-core tracks.

Compared to the version we entered last year, this version of Yices 2 now supports the arrays theory in the MCSAT implementation. This allows us to compete in the arrays with nonlinear arithmetic divisions. Similar to last year, we use Kissat as backend SAT solver in the single-query and model-validation tracks of QF_BV.

References

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