Yices 2 in SMT-COMP 2021

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Introduction

Yices 2 is an open-source SMT solver developed and distributed by SRI International. It is available for download at `http://yices.csl.sri.com` and on our GitHub repository at `https://github.com/SRI-CSL/yices2`. Yices 2 supports linear and non-linear arithmetic, bit-vectors, uninterpreted functions, and arrays.

Yices 2 relies on the standard CDCL(T) architecture and uses a variant of the Nelson-Oppen method for combining decision procedures. Details are presented in [1]. Yices 2 also includes a solver that implements the Model-Construction Satisfiability Calculus (MCSAT) [3, 4, 2]. By default, MCSAT is used for all theories that require non-linear arithmetic and CDCL(T) is used for everything else.

The latest version of Yices 2 includes new features and improvements:

- It supports a new form of SMT reasoning that we call satisfiability modulo a model. This amounts to checking that a partial model (provided by the user) can be extended to a full model of a formula. Satisfiability modulo a model is supported by Yices's MCSAT solver.

- Interpolant generation is now supported by building on solving modulo a model [5].

- Quantifier reasoning is supported for the UF theory. The solver implements E-graph matching and model-based instantiation.[1]

Competition Version

In the 2021 SMT competition, we are entering the latest development version of Yices 2.6.2, in all the logics and divisions it supports, including the incremental, model-validation, and unsat-core tracks.

The main difference with the version that we entered last year is support for quantifiers in the UF theory. In most other theories, the 2021 version is the same as the 2020 version, apart for bug fixes and improvements to the production of models in the SMT-LIB format. As last year, we use Kissat `http://fmv.jku.at/kissat` as backend SAT solver in the single-query and model-validation tracks of QF_BV.

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[1] Support for quantifier reasoning was developed by Aman Goel in an internship. Aman is a student at the University of Michigan

References

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