Yices 2 in SMTCOMP 2019

Yices 2

- Supports linear and non-linear arithmetic, arrays, UF, bitvectors
- Supports incremental solving and unsat cores
- Includes two types of solvers: classic CDCL(T) + MC-SAT
- https://github.com/SRI-CSL/yices2
- https://yices.csl.sri.com

New in 2019

- Models in SMT-LIB2 format
- Improved bitblasting-based solver
- MC-SAT for bitvectors
- Thread-safe

Bitblasting-Based Solver

Bitblasting in Yices 2

- implemented in 2009 + extended with many simplifications and rewriting rules
- uses a relatively simple CDCL solver (no preprocessing, simple heuristics)
- incremental

New developments

- support for third-party SAT-solvers (as long as provide the right API)
- currently supported:
  - CaDiCal (Armin Biere)
  - CryptoMiniSAT (Mate Soos)
- We also have developed a new, more performant CDCL-based SAT solver to replace the default

MC-SAT for Bitvectors

MC-SAT

- alternative to CDCL(T)
- in Yices: used primarily for non-linear arithmetic (+ UF)

New developments

- extended MC-SAT to QF_BV: our goal is to support word-level reasoning
  - BDDs for representing sets of values
  - specialized reasoning components for two QF_BV fragments:
    - concatenation + extraction + equalities
    - (simple) linear-arithmetic
  - unsat cores + bit-blasting outside these framents
- still work in progress, very fast on some examples