raSAT 0.3 and raSAT 0.4 (exp) for SMT-COMP 2016

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raSAT is an SMT solver for polynomial constraints. It consists of a simple iterative approximation refinement, called raSAT loop [2], which is an extension of the standard Interval Constraint Propagation with Testing and the application of the Intermediate Value Theorem (IVT).

raSAT 0.3

In comparison with raSAT 0.2, raSAT 0.3 possesses the improvement in the phase of contracting variables’ intervals from the constraint (backward propagation). As a result, the ability of detecting UNSAT has been enhanced.

raSAT 0.4 (exp)

From the experiments, we observe that raSAT 0.2 performs better than raSAT 0.3 in determining satisfiability of polynomial constraints. This is because “heavy” intervals decomposition in raSAT 0.2 results in speedy appearance of small variables’ intervals which consequently make the result of Interval Arithmetic more precise. In order to cooperate the ability of detecting unsatisfiability of raSAT 0.3 and the ability of detecting satisfiability of raSAT 0.2, raSAT 0.4 is a parallel combination of those two versions. The combination is done via a Python script. In addition, raSAT 0.2 in this combination has been enhanced with the revision of the application of the IVT.

Utilized packages

raSAT takes advantages from the following packages/libraries.

- miniSAT³ as the back-end SAT solver.
- iRRAM for confirmation of SAT instances.
- The library in [1] for round-down/up in each Interval Arithmetics.

³ http://minisat.se/
Package Distribution

Source code and precompiled versions of raSAT can be downloaded from http://www.jaist.ac.jp/~s1310007/raSAT/.

References
