SMT-RAT 22.06

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SMT-RAT [2] is an open-source C++ toolbox for strategic and parallel SMT solving consisting of a collection of SMT compliant implementations of methods for solving quantifier-free first-order formulas with a focus on non-linear real and integer arithmetic. Further supported theories include linear real and integer arithmetic, difference logic, bit-vectors and pseudo-Boolean constraints. A more detailed description of SMT-RAT can be found at https://smtrat.github.io/.

SMT-RAT-MCSAT uses our implementation of the MCSAT framework [3]. We employ incomplete methods to handle simpler problem classes more efficiently. Thus, our implementation is equipped with multiple explanation backends based on Fourier-Motzkin variable elimination, interval constraint propagation, virtual substitution as in [7], a novel level-wise variant (currently under review) of the one-cell CAD [1] and NLSAT-style model-based CAD projections [6], which are called in this order. The general MCSAT framework is integrated in our adapted minisat [4] solver, but is not particularly optimized yet. Furthermore, our variable ordering is fully dynamic as suggested in [5].

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References

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