

# SMT-COMP '06 Entry: the Cooperating Validity Checker (CVC)

Aaron Stump  
Washington University in St. Louis  
St. Louis, Missouri, USA

The Cooperating Validity Checker (CVC), designed and implemented by the submitter, Clark Barrett, and David Dill [4], combines the Chaff SAT solver [2] with decision procedures (DPs) for arrays [5], reals, uninterpreted functions, and datatypes (although the datatype DP has known problems and should not be used at present). The combination is in the Nelson-Oppen style [3], and the code is written in C++. Although CVC is not actively developed or maintained, and has been superceded by CVC Lite [1], whose codebase is smaller and more comprehensible; nevertheless it remains of interest for its reasonably good performance and for historical comparison.

The version of CVC submitted to SMT-COMP '06 is substantially the same as the version 1.0b, submitted to SMT-COMP '05. Version 1.0b incorporates ideas on mining equality proofs to reduce the size of the conflict clauses produced by the decision procedures [6], and its sources and Linux executable may be found in the Software section of <http://c1.cse.wustl.edu/>. The only changes this year are porting to gcc 3.4.4 (from a very old gcc), and the quite minor ones of disabling the top-level call to the type checker, as well as TCC generation (which should not be relevant for SMT-COMP since SMT-LIB does not have support for partial functions; but the TCC insertion code seemed to segfault on at least one SMT-LIB benchmark). CVC does not implement integer reasoning, and so as for SMT-COMP '05, it must return **unknown** for benchmarks in the QF\_AUFLIA division that the tool, using its linear real arithmetic DP, determines are satisfiable. Due to the lack of integer or bitvector solvers, or a difference logic solver, CVC is competing just in QF\_LRA, QF\_UF, and QF\_AUFLIA.

## References

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