

# NECLA Verification Benchmarks

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## 1. NECLA BMC Benchmarks (necla-bmc)

In this directory, there are 8 benchmark examples.

The verification models (e.g., "ftp\_1.blf") are in the BLIF format. Each model has a corresponding property file (e.g., "ftp\_1.prp"), which consists of a set of negated invariant properties. The properties are of the form  $EF !p$ , where  $p$  is a propositional formula. These are useful for finding bugs for invariant properties ( $AG p$ ) by using BMC.

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Please contact Chao Wang (chaowang@nec-labs.com) for any questions/comments.

```
-----  
1866      bakery.blf    combinational=958      pi=32  latches=84  
169540    ftp_1.blf    combinational=87442    pi=32  latches=7880  
106033    ftp_2.blf    combinational=54264    pi=32  latches=5031  
69256     ftp_3.blf    combinational=54264    pi=32  latches=5031  
21314     ftp_4.blf    combinational=10963    pi=32  latches=1094  
2294      ftp_5.blf    combinational=169      pi=1888 latches=21  
9847      tcas-1a.blf  combinational=5013     pi=0   latches=440  
11435     tcas_all.blf combinational=5767     pi=0   latches=362  
-----
```

```
-----  
1 bakery.prp    no witness  
164 ftp_1.prp  
102 ftp_2.prp  
64 ftp_3.prp  
69 ftp_4.prp  
2 ftp_5.prp    no witness, no witness  
1 tcas-1a.prp  no witness  
1 tcas_all.prp witness  
-----
```

## **2. NECLA SMT Benchmarks (necla-smt)**

In this collection, there are 3 main categories of benchmarks in SMT-lib format.

1. small-smt.tar: 40 small examples,  
names listed in file list-small-smt,  
sat/unsat results reported by yices 1.0 in outfile-small-smt.
2. meds-mts.tar: 364 medium examples,  
names listed in file list-med-smt,  
sat/unsat results reported by yices 1.0 in outfile-med-smt.
3. large-smt.tar: 2383 large examples,  
names listed in file list-large-smt,  
sat/unsat results could not be obtained.

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Please contact Malay Ganai ([malay@nec-labs.com](mailto:malay@nec-labs.com)) for any questions/comments.

## **3. NECLA SAT Benchmarks (necla-sat-ckt)**

These benchmarks for SAT are derived from BMC application in NEC's VeriSol verification platform. Each benchmark corresponds to a BMC instance at some unrolled depth. It represents a SAT formula in circuit BLIF format (not CNF).

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## **4. NECLA Static Analysis Benchmarks (necla-static-small)**

These benchmarks are small C programs that demonstrate common programming situations that arise in practice such as interprocedural dataflow, aliasing, array allocation modes, array size propagation, string library usage and so on. The ability of different static techniques to prove them correct is an indication of their areas of strengths and weaknesses.

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