raSAT - report

September 4, 2014

1 Old status

In the experiments, we allow 2^{10} test cases, only one variable is decomposed. Two experiments:

1.1 No epsilon

We continue decompose intervals even when their length is very small.

Result(see "1.1.xls" file): 50 problems in Zankl, round-off error is more likely to exist.

1.2 SAT directed, epsilon=0.1

After one interval is decomposed, we use IA to evaluate the two new intervals. We choose the interval which makes the TEST-UNSAT API have a longer SAT.

Result ("1.2.xls" file): 42 problems in Zankl.

2 Current status

We still set epsilon=0.1.

2.1 Unbalanced decomposition using sensitivity

Example: Suppose we have the constraint:

$f = -x_{15} * x_8 + x_{15} * x_2 - x_{10} * x_{16} > 0$.

With $x_2 \in [9.9, 10], x_8 \in [0, 0.1], x_{10} \in [0, 0.1], x_{15} \in [0, 10], x_{16} \in [0, 10]$, the result of AF2 is: $0.25\epsilon_2 - 0.25\epsilon_8 - 0.25\epsilon_{10} + 49.5\epsilon_{15} - 0.25\epsilon_{16} + 0.75\epsilon_{+-} + 49.5$