Motivation

- Quality assurance is important for computational systems
- Common theoretical foundations are shared among different fields
- Analysis tools/algorithms are usually developed for a specific model
- Leveraging knowledge from one field to another is difficult!

Analysis Tool Chain

Translating Btor2 to C

1 sort bitvec 3
2 zero 1
3 state 1
4 init 1 3 2
5 input 1
6 add 1 3 5
7 one 1
8 sub 1 6 7
9 next 1 3 8
10 ones 1
11 sort bitvec 1
12 eq 11 3 10
13 bad 12

Each line represents a node and has a unique id
A typical Btor2 operation is written as
< nid0 > < op > < sid > < nid1 > [ < nid2 > [ < nid3 > ] ]

Btor2C: a translator from word-level sequential circuits to C programs

Try Btor2C!

- Btor2C is a lightweight tool written in C
- Open-source under Apache 2.0 License

Software vs. Hardware Analyzers on HWMCC Tasks

1. Btor2C, a translator from word-level Btor2 sequential circuits to C programs
2. 43 HW-verification tasks were uniquely solved by SW analyzers in our evaluation
3. With Btor2C, we can
   - verify HW designs with SW analyzers, and
   - improve quality assurance for HW systems
4. In the future, we also plan to translate SW programs into HW circuits.