FSML++ + Testing

Carsten Hartenfels   Benjamin Haßel

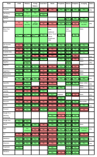
2014-02-26

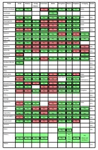
Contents

1. Frameworks

1. Frameworks

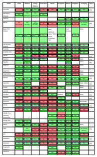
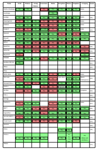
- Many available...





1. Frameworks

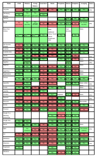
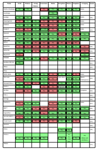
- Many available...

- ...but unsuitable to our approach

1. Frameworks

- Many available...

- ...but unsuitable to our approach

- Simple algorithm

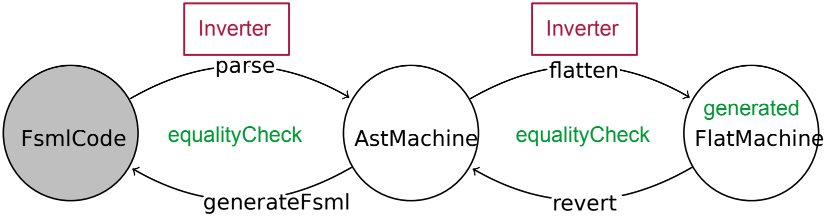
2. What we do

2. What we do

- Identity Testing

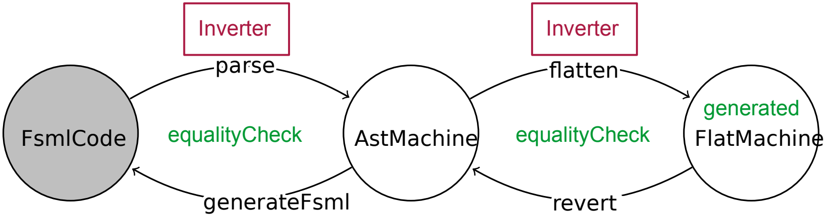
2. What we do

- Identity Testing
- Testing parser, abstract syntax and flat representation



2. What we do

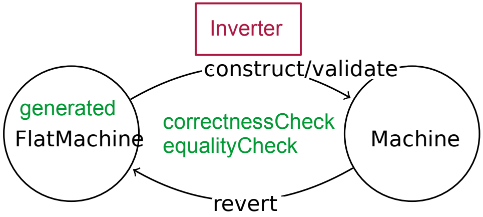
- Identity Testing
- Testing parser, abstract syntax and flat representation



- BUT not checking any constraints

2. What we do

- Solution: Oracle



3. TestDataGeneration

- Algorithm (2 states / 25 configurations)

Goedel Number	Transition		
0			
1	s0 → s0		
2	s1 → s0		
3	s0 → s1		
4	s1 → s1		
5	s0 → s0	s0 → s0	
6	s1 → s0	s0 → s0	
7	s0 → s1	s0 → s0	
8	s1 → s1	s0 → s0	
9	s0 → s0	s1 → s0	
10	s1 → s0	s1 → s0	
11	s0 → s1	s1 → s0	
12	s1 → s1	s1 → s0	
13	s0 → s0	s0 → s1	
14	s1 → s0	s0 → s1	
15	s0 → s1	s0 → s1	
16	s1 → s1	s0 → s1	
17	s0 → s0	s1 → s1	
18	s1 → s0	s1 → s1	
19	s0 → s1	s1 → s1	
20	s1 → s1	s1 → s1	
21	s0 → s0	s0 → s0	s0 → s0
22	s1 → s0	s0 → s0	s0 → s0
23	s0 → s1	s0 → s0	s0 → s0
24	s1 → s1	s0 → s0	s0 → s0
25	s0 → s0	s1 → s0	s0 → s0

3. TestDataGeneration

- State&Step-Generation

```
static FlatStep
genStep(const cpp_int& pos, const cpp_int& num, const cpp_int& states)
{
    const cpp_int source = (pos / num) % states;
    const cpp_int target = (pos / (num * states)) % states;
    return {"s" + source.str(), "input" + pos.str(), "", "s" + target.str()};
}


const cpp_int states = stateCount;
const cpp_int pow = states * states;
for (cpp_int off = 1, no = pow, num = 1; off <= t; off += no, no *= pow, num *= pow)
    fm.addStep(genStep(t - off, num, states));

return fm;
```

Thank You All For Listening

GitHub: `https://github.com/hartenfels/FSMLplusplus/`