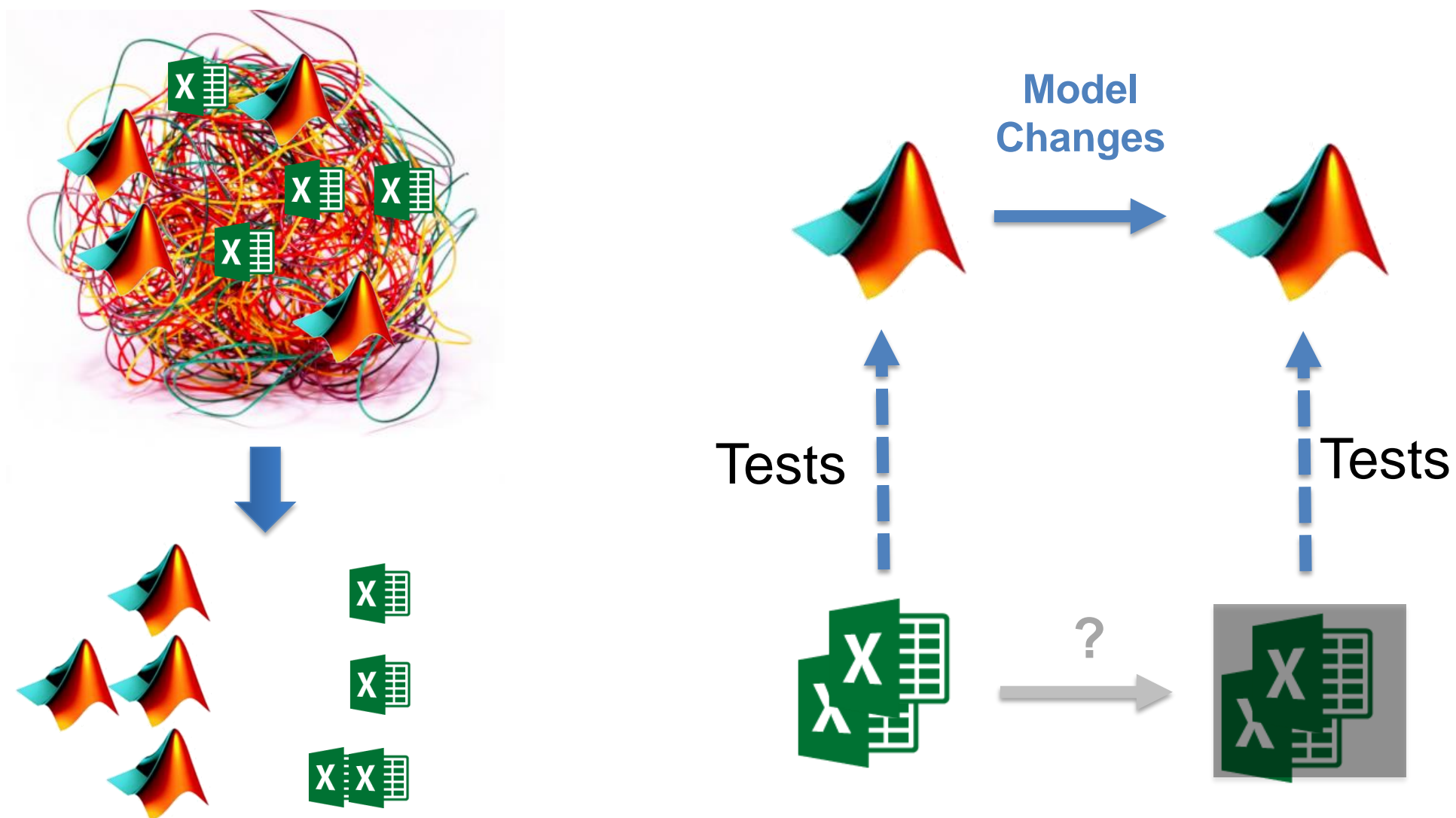# Supporting Simulink Model Management

Eric J. Rapos, James R. Cordy
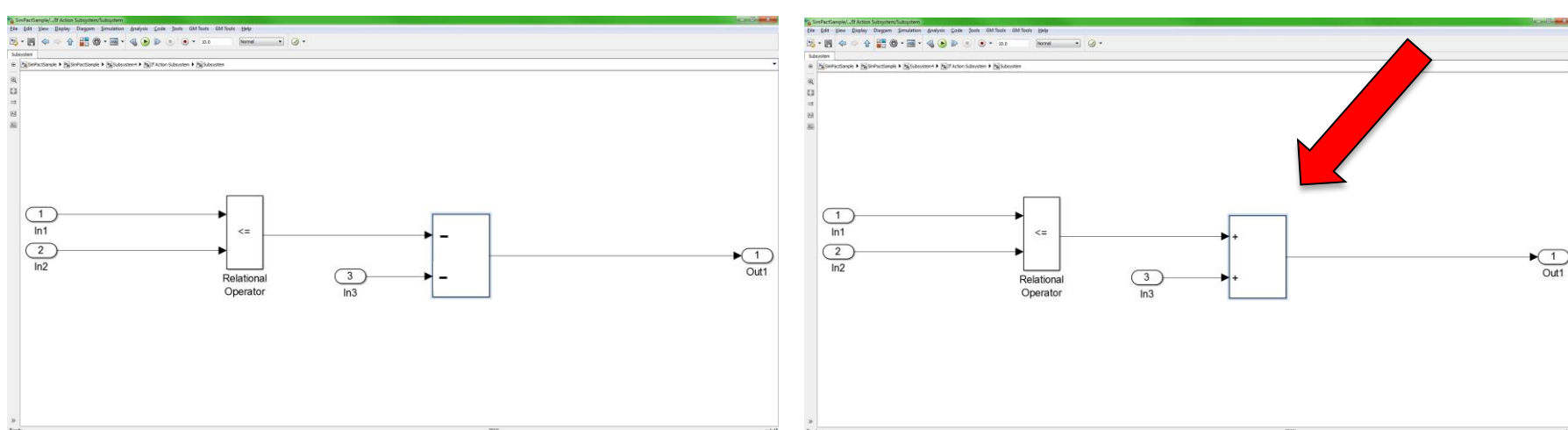
What is Model Management?
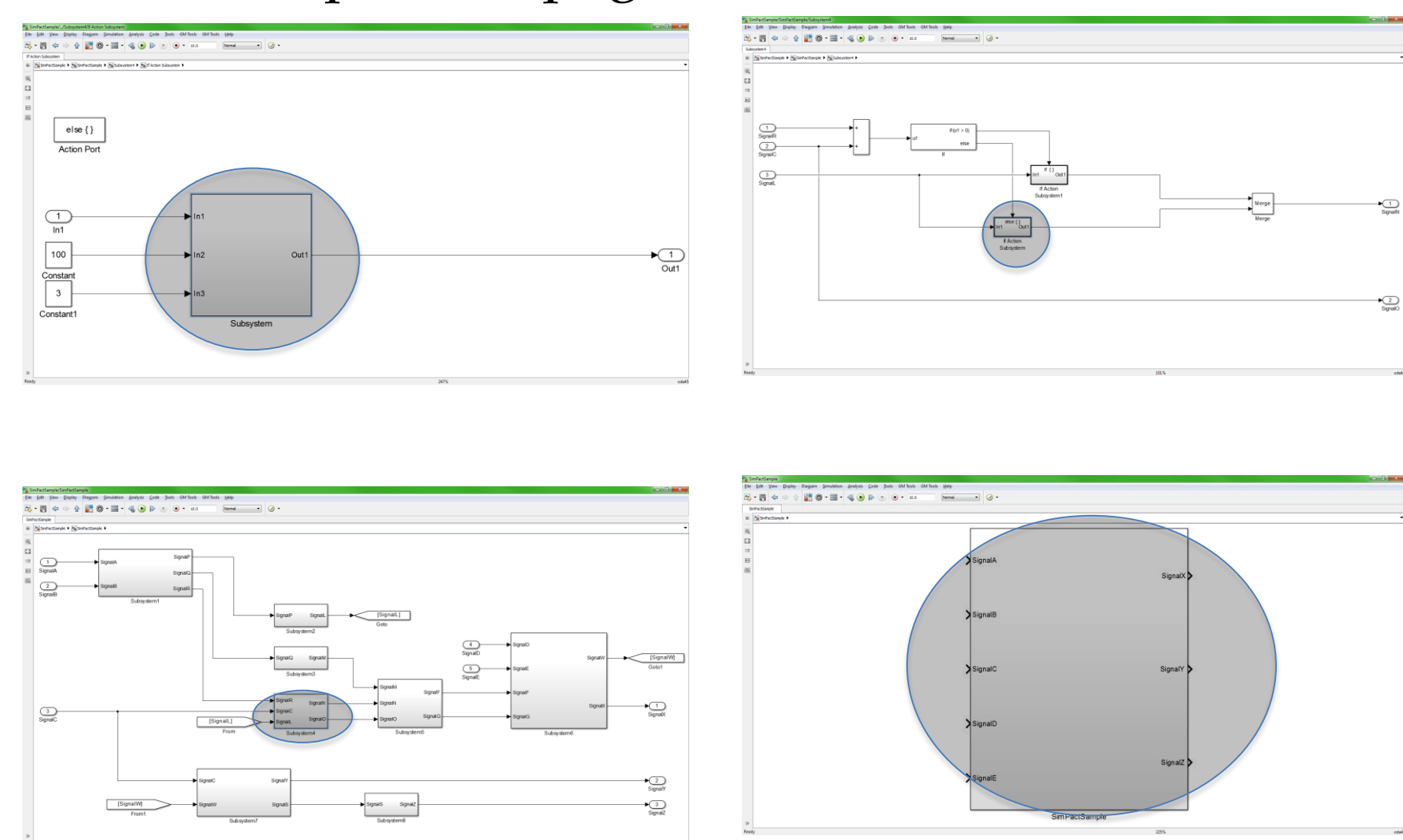

Change Impact Analysis

Phase 1: Differencing
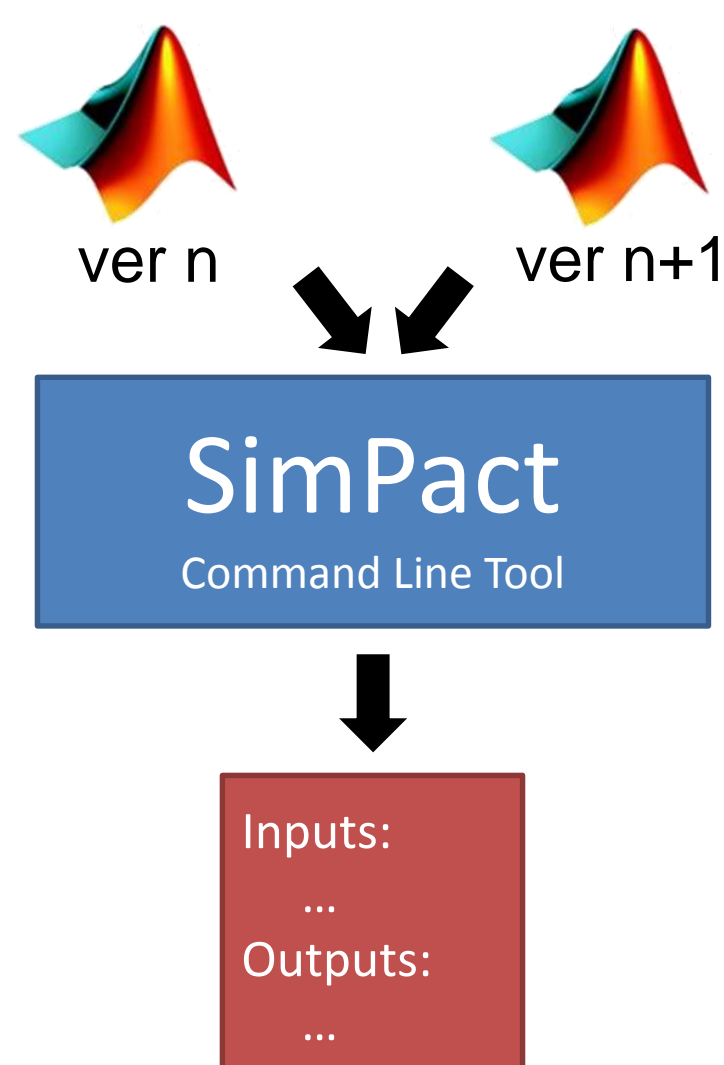

Phase 2: Impact Propagation

SimPact: Simulink Impact Analysis

Static

ver n → SimPact Command Line Tool ← ver n+1

Inputs:
...
Outputs:
...

Interactive

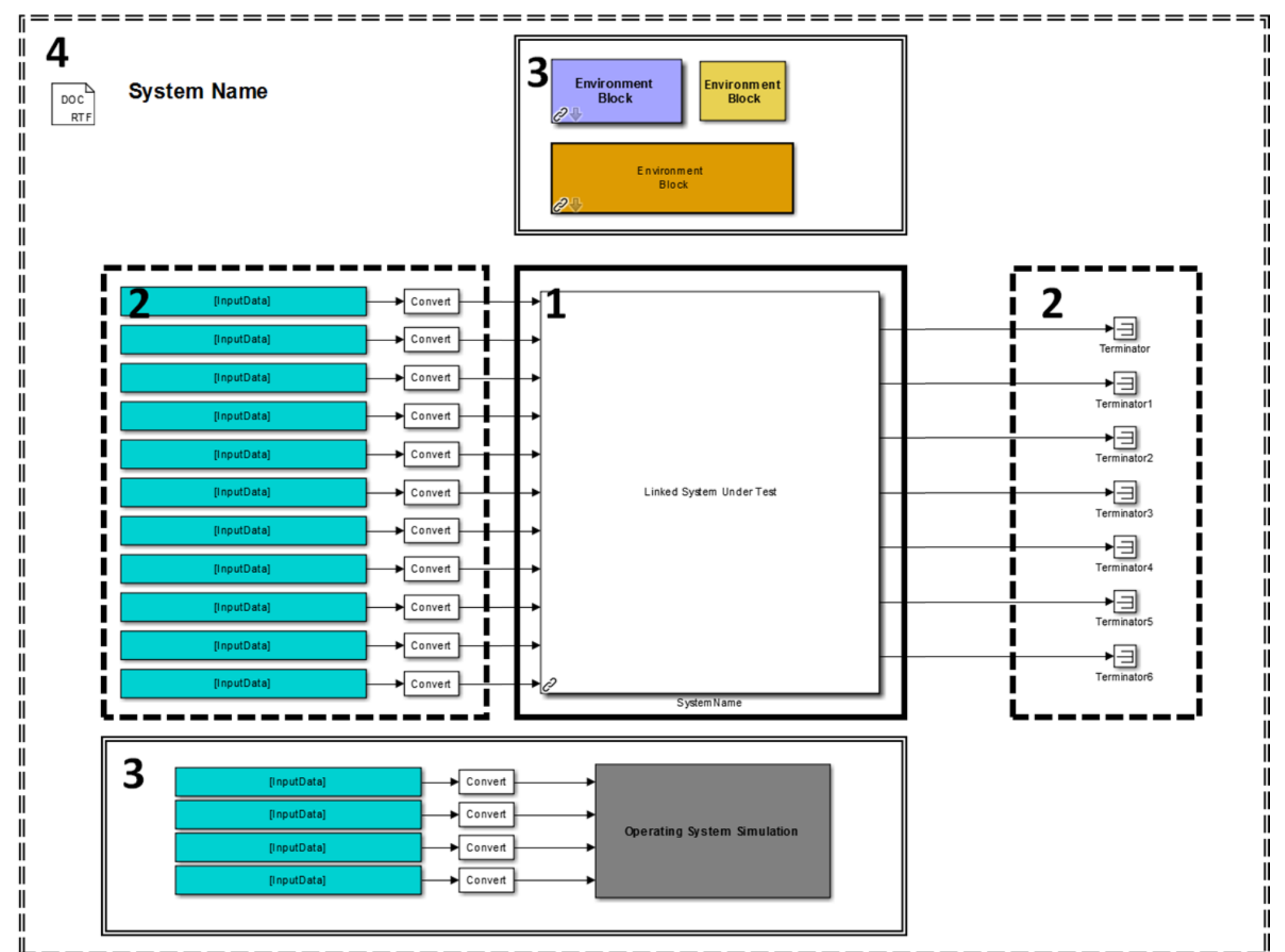Highlight Forward Impact
Highlight Backward Impact
Highlight All Impact
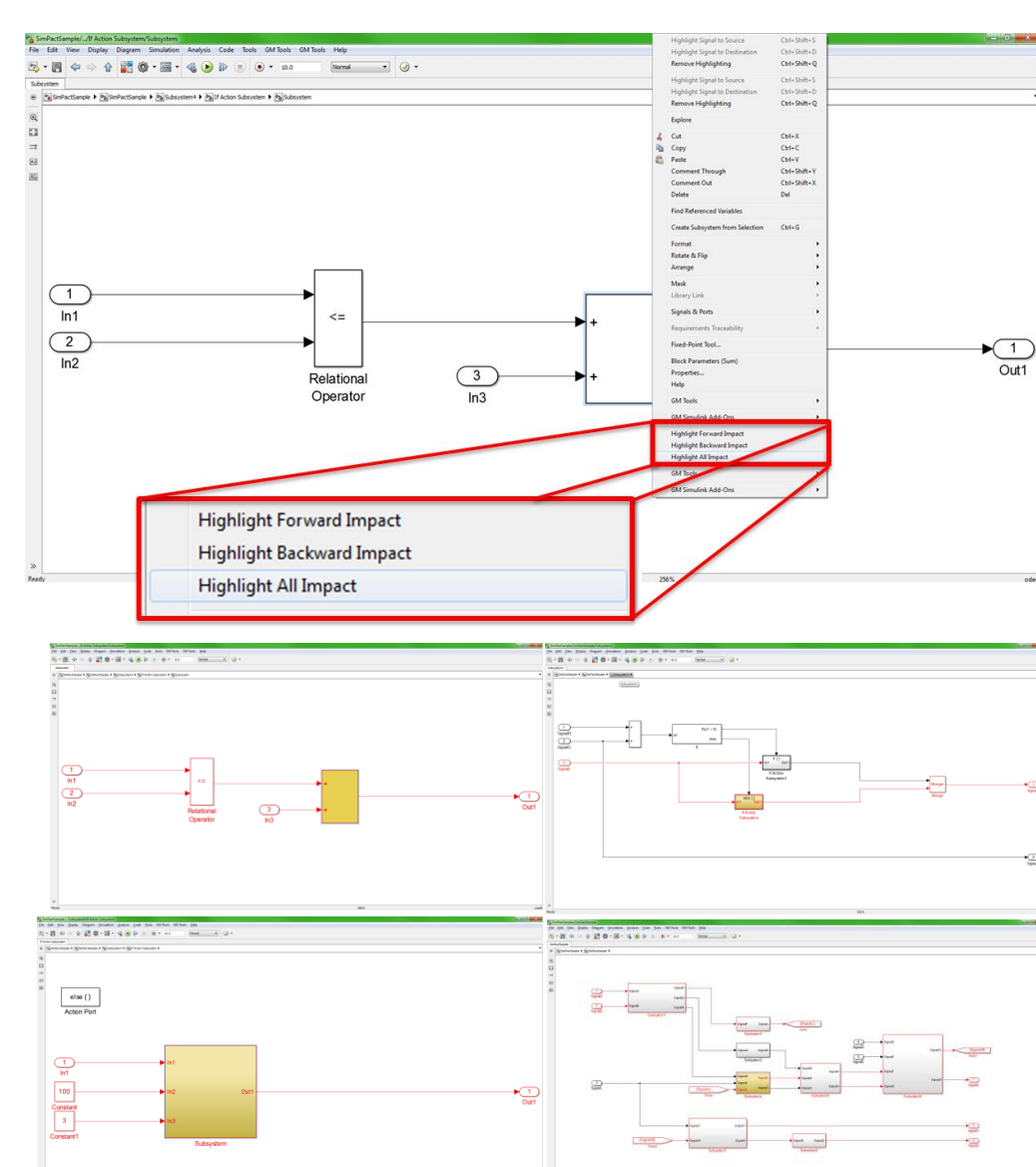
SimTH: Simulink Test Harness Generator

1. Inclusion of System Under Test
2. Input and Output Management
3. Environment Simulation
4. Standardization

Validation

SimPact

	Output Precision	Output Recall	Input Precision	Input Recall
Ver1-2	0.58	0.65	0.66	0.67
Ver2-3	0.85	0.85	0.91	0.91
Ver3-4	0.99	0.97	0.99	0.98
Ver4-5	0.61	0.62	0.76	0.83
Ver5-6	0.85	0.85	0.89	0.90
Ver6-7	0.84	0.85	0.80	0.81
Ver7-8	0.98	0.99	0.98	0.99
Ver8-9	0.96	0.95	0.99	0.99
Average	0.83	0.84	0.87	0.89

F-Measure Scores:

Outputs: 0.84
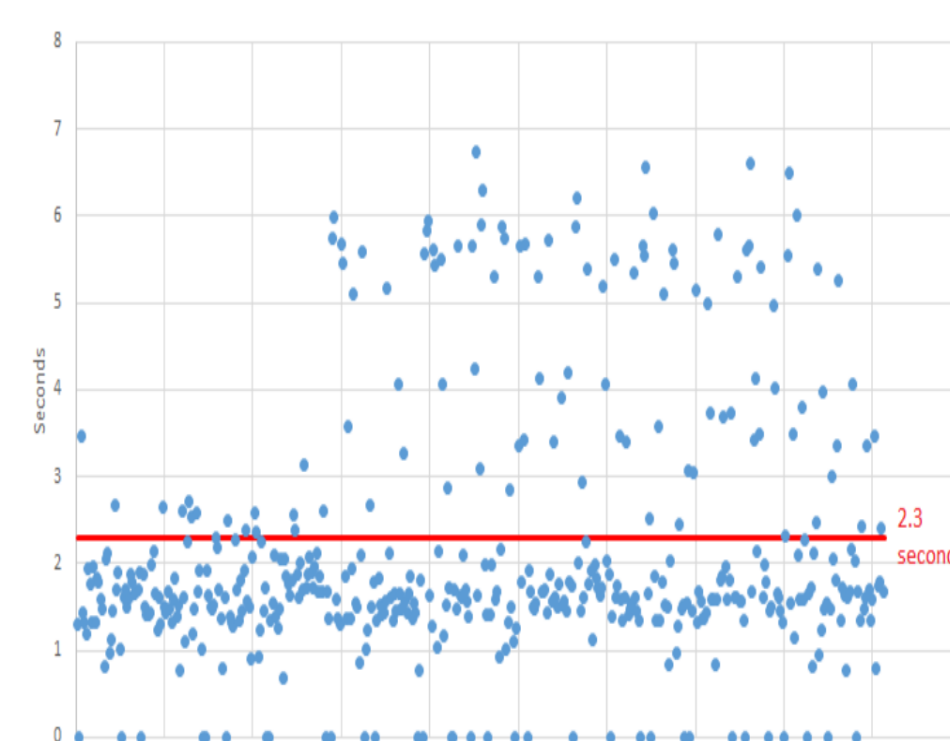Inputs: 0.88

Corrected F-Measure Scores:

Outputs: 0.95
Inputs: 0.93

Indicates Major Release Step

SimTH

Time

2.3 seconds

Correctness

- Tested only on final release (45 models)
- Of these 39 were produced correctly (86.7%)
- Low correctness due largely to older models with inconsistent modeling conventions
- SimTH tested by industry partner on models we cannot access – issues seem to be resolved