Towards Automatic Program Specification Using SME Models

Communicating Process Architectures 2018 – Technische Universität Dresden

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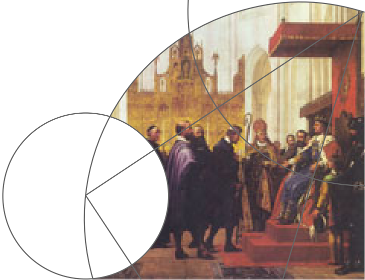

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4th June 1996

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No people where harmed

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25th February 1991 in the Persian Gulf war

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Inaccurate results == missile misses target

What can SME do?

The SME model builds on the CSP algebra

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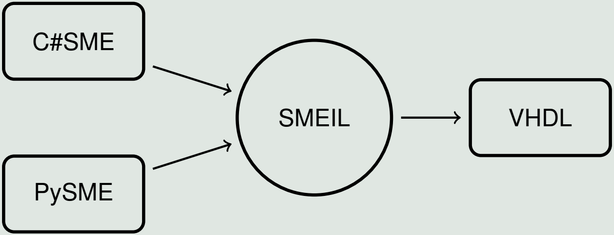

Figure. SMEIL transpiler structure.

Simple example

Seven Segment Display

Figure (Truls or something else?)

Seven Segment Display example

Write the seven segment circuit in SMEIL

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Verify in FDR4

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We can verify that the values communicated to the seven segment displays does not exceed the expected values.

Simple example

Seven Segments SMEIL Structure

SMEIL code

Simple example

Seven Segments SMEIL Structure

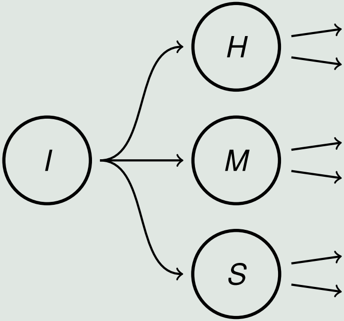

Figure. SMEIL network for a seven segment display clock. Each SMEIL process is represented by a cicle with a letter corresponding to the processes Input, Hours, Minutes and Seconds respectively.

CSPm process structure

Code example

Monitor process

Code example

Example continued

Run

All of the following CPU examples have been run on a Intel(R) Core(TM) i7-3770 CPU @ 3.40GHz.

The GPGPU examples are run on GeForce GTX 680 (OpenCL C 1.1).

All examples were run 10 times and the average was measured.

Results - time to verify in FDR4?

The seven segment example have been run on a ...

The example were run x times and the average was measured.

Conclusion

Productivity and performance

....

Future work

DSL

....

Questions?

Comments?

Feel free to ask anything.