Tools and Techniques for Integrating Performance Analysis and System Verification (TIPSy)

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TIPSy (NWO project 612.064.205)

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Goal

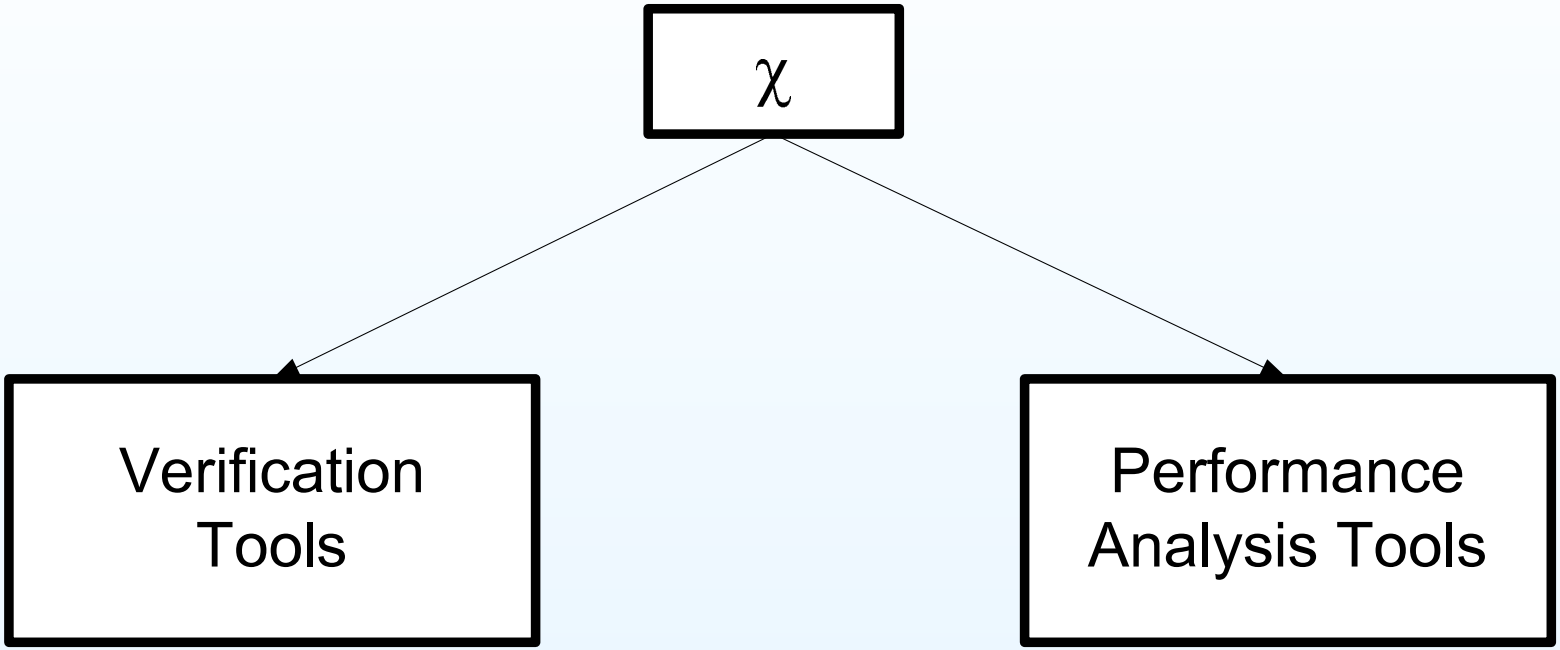
Build an environment for model based analysis of industrial systems that combines

- performance analysis
  - What is the throughput of my system?
  - What percentage of time my system is idling?
  - ...
- functional analysis
  - Does my system have deadlock?
  - Does it behave as specified?
  - ...

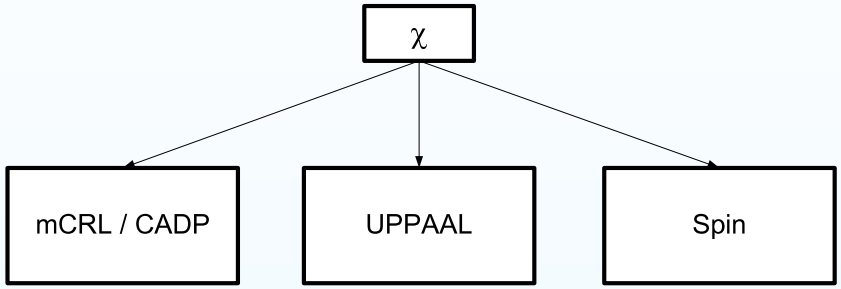
and that provides techniques for

- optimizing performance
- reducing complexity of models

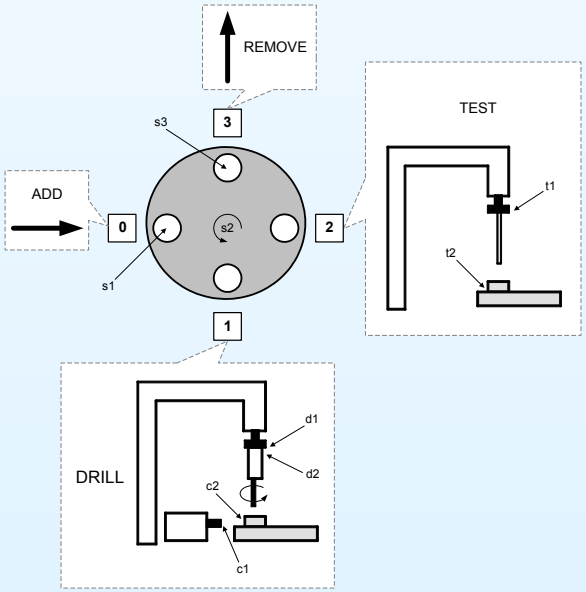
Current Approach



Result 1



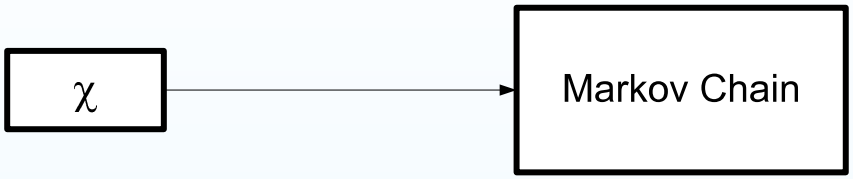
Case study: A Turntable Drilling Machine



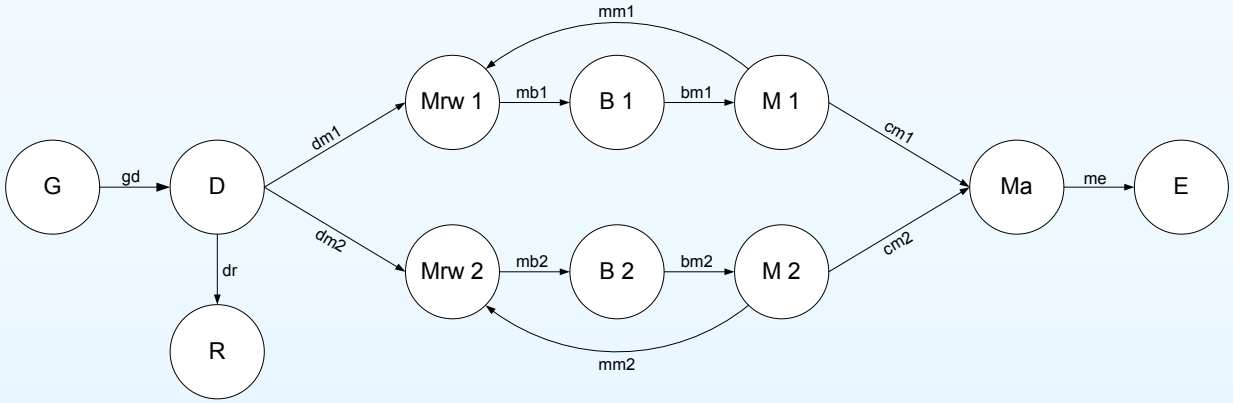
Verified:

1. No deadlock
2. No rotating while drilling
3. Every product is eventually drilled
4. ...

Result 2



Case study: A Small Manufacturing Line



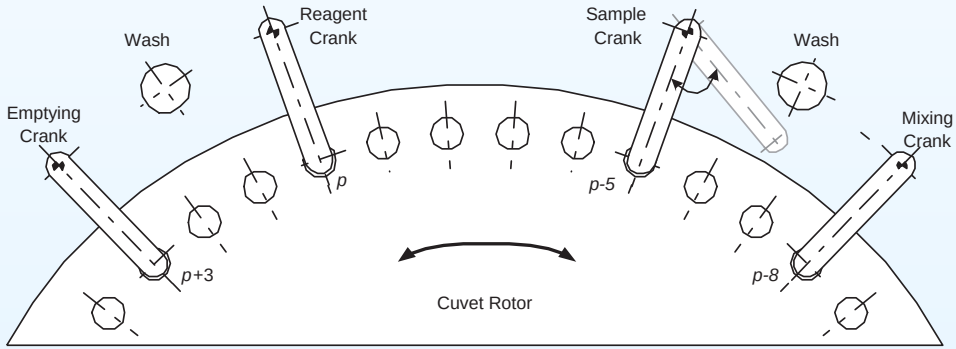
Obtained:

1. Throughput of the system
2. Utilization of machines
3. Average number of products in the system

Result 3

- Method for automatic generation of optimal schedules

Case study: A Clinical Chemical Analyzer



Obtained:

- optimal schedules for different batches of tests

Future Work

- More case studies
- Automatic generation of Markov reward models
- Reduce complexity of χ models by by static analysis techniques