Furness Toolset for the AADL

SAE AS2C
Salt Lake City
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Good news 😊

- Duncan has recovered and is back in the office
  - Took him only three months

- Activities in the past 3 months:
  - Bug fixes and “hardening”
  - Simulator updates
Furness Toolset for the AADL

**Background**

- **Development**
  - Joint effort of Fremont Associates and Penn under an AFOSR STTR.

- **Business Model**
  - Give the stuff away
  - Sell support
    - Traditional customer service roles
    - Ongoing maintenance and enhancements
Furness Toolset for the AADL

Features

- Furness Perspective
  - Eclipse perspective providing task-oriented interface for AADL tools

- Schedulability Analysis
  - Binary schedulable/unschedulable report
  - Best/Worst-Case Execution Time by Thread
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Features

- Thread Simulation in the Eclipse Debugger
  - Interactive Simulation (single-step, run to breakpoint, etc.)
  - Manual or random non-determinism resolution
  - Graphical timing diagram view of simulation progress
  - Graphical view of resource utilization over time
  - Graphical view of thread states over time
Tool Architecture

OSATE

Instantiation

Translation

Debug perspective

Simulator interface

Schedulability analysis view

Schedulability analysis

State interpretation

VERSA
New simulator features

- Support for immediate data connections
  - Trickier than we expected

- Cycles of immediate data connections need to be disallowed
  - Need to make sure there is a statement to that effect in the standard
Simulator UI features

- Progress controls
  - Run until next breakpoint or choice point
  - Pause a run
  - Terminate simulation
  - Skip a time step
  - Perform an execution step in a thread

- Variables view
  - Displays static and dynamic values
Simulator UI features

- Thread status view

- Thread blocked on immediate data connection
- Thread preempted by priority
- Thread is currently executing
Simulator UI features

- Trace view
  - Displays thread state and resource use

- Processor idle
- Processor busy
- Thread awaiting dispatch
- Thread blocked
- Thread running
Support for shared resources
  - Some concurrency control protocols are easier than others
Support for behavioral annex
  - No conceptual problems
Support for modes
  - Need to rethink instantiation
Coming up - Furness

- Furness release schedule aims to coordinate with OSATE/TOPCASED
  - Integration problem with the latest TOPCASED release

- VERSA enhancements
  - Enable more efficient simulation
Questions? Comments?

Free download:
- [http://www.furnesstoolset.com](http://www.furnesstoolset.com)

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Deterministic sampling?

- Seems to depend on other threads and scheduling protocol

[Diagram showing the concept of deterministic sampling with arrows indicating preemption points]