PeaCE (Ptolemy extension as Codesign Environment)

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- Research prototype as a codesign environment based on Ptolemy Classic
- Focuses on synthesis
  - Use domains with clear refinement process – SDF and FSM
  - Enlarge the modeling capability by simple extension
    - SPDF: Synchronous Piggybacked Dataflow
    - fFSM: flexible FSM – hierarchical and concurrent FSM
  - Open global optimization possibility
    - Codesign backplane (BP domain): derived from DE domain
- Goal
  - Obtain the optimal architecture with given system requirements and constraints
  - "Efficient implementation" with a given architecture.
Codesign Backplane

- Central backbone for domain interactions
- Maintain global information of component models during the codesign process
- It supports
  - cospecification of control and function modules
  - cosimulation with HW/SW simulators
  - will support cosynthesis

Backplane (BP)

Codesign Workflow (1)

- Simulation (1) Data Flow Graph
- Cosimulation (2) SDF
- HW Synthesis (3)
- SW Synthesis
- C-code for SW synthesis
- Structural VHDL code for HW synthesis
Codesign Workflow (2)

- Architecture Selection
- HW/SW Partitioning
- Interface Generation
- SW Graph
- HW Graph

Software Structure

- PeaCE
  - PeaCE Daemon
  - PeaCE (Ptcl)
  - DBMS (Postgres)
  - XServer (weirdX)
  - Server (c++, itcl)
- Hae (GUI for PeaCE)
  - Client (Java)
Come and See!

- **Demonstration**
  - Codesign flow with simple examples
  - Other research results

- **Lesson**: more time spent, more work remained!
- **We appreciate Ptolemy team’s excellent work!!!**

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