

Assignment 4

1. Become familiar with the System-on-Chip Environment (SCE)

– Setup

- Note that we will use the 2003 version of SCE for the tutorial:
- `source /opt/sce-20030530/bin/setup.csh`
- `rm -rf ~/.sce`
- `mkdir demo`
- `cd demo`
- `setup_demo`

– Open the SCE Tutorial document

- `acroread SCE_Tutorial/sce-tutorial.pdf &`
- To protect the environment and save some trees, please *do not print* the tutorial document!
It contains 250 pages and you will likely read it only once... ;-)

– Follow the SCE Tutorial instructions

- `sce &`
- ...

– Cleanup

- When done (or to start over), clean up your demo directory
- `cd ..`
- `rm -rf demo`

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2. Complete JPEG Encoder application into SpecC Model

- Version 0
 - Compile JPEG Encoder with SpecC compiler
 - `scc jpegencoder.sc -vv -ww`
- Version 1
 - Introduce test bench
 - Stimulus behavior (`ReadBmp`)
 - Design-under-Test behavior (`JPEGencoder`)
 - » Seq. child behaviors (`DCT1`, `DCT2`, `Quantize`, `Zigzag`, `Huffman`)
 - » Communication through variables mapped to ports
 - Monitor behavior (`DiffGolden`)
- Version 1.1
 - Add timing to test bench
 - Print encoding time for each block (in Stimulus and/or Monitor)
- Version 2.0
 - Create a parallel model
 - Change DUT execution to `par { }`
 - Change communication to typed `double_handshake` channels
- **Version 2.1**
 - Create a pipelined model
 - Change communication to **typed queue channels**

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3. Simulate your JPEG Encoder model "V2.1" in SCE
 - Setup
 - Note that we will use the 2008 version of SCE for the JPEG Encoder:
 - `source /opt/sce-20080601/bin/setup.csh`
 - `rm -rf ~/.sce`
 - `cd jpegencoder`
 - `sce`
 - Create a new project in SCE
 - `Project->New`
 - `Project->Settings`
 - Set verbosity level to 3 and warning level to 2
 - Adjust any other options the compiler may need to compile your model
 - `Project->SaveAs "jpegencoder.sce"`
 - Load your design model into SCE
 - `File->Import "jpegencoder.sc"`
 - `Project->AddDesign`
 - Right-click on `jpegencoder.sir` in the project window, and `Rename` the model to `JPEGencSpec`
 - Compile and simulate your model in SCE
 - `Validation->Compile`
 - `Validation->Simulate`

No warnings!
Successful!

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4. Analyze your JPEG Encoder model in SCE
 - Setup
 - ...continued from step 2 (previous page)
 - View the structural hierarchy chart
 - Select the **Main** behavior in the behavior browser
 - Right-click ->**Chart**
 - Double-click the chart to add a level of hierarchy
 - **View->Connectivity**
 - ...
 - **Window->Print...** to file `"jpegencoder.ps"`
 - Deliverables
 - SpecC source file
 - `"jpegencoder.sc"` **One single/complete file!**
 - Hierarchy chart
 - `"jpegencoder.ps"` **One chart with connectivity!**
 - Due
 - by Friday, **Oct 31, 2008**, at noon
 - by email to `doemer@uci.edu` with subject **"EECS222C HW4"**