EECS 222C
System-on-Chip Software Synthesis
Spring 2013

Assignment 8

Posted: May 31, 2013
Due: June 7, 2013 at 12pm (noon)

Topic: Based on a central ARM7TDMI Processor and custom hardware, design a SoC implementation of the MP3 Decoder model that meets the real-time requirements and minimizes HW resources and power

1. Setup:

This assignment is essentially the same as the previous Assignment 7, with the exception that we must meet the hard real-time requirements of the application and want to minimize cost at the same time. Minimizing cost here means to minimize the number of custom hardware accelerator units and the overall power consumption. Note that power is minimized by maximizing the clock frequency of the PEs used.

You may want to reuse as much as possible from the previous Assignment 7. For that purpose, we will reuse the data in your **hw7** directory. As we have done before, we can do that by creating a symbolic link to the **hw7** directory, as follows:

```
ln -s hw7 hw8
cd hw8
```

The setup remains the same as in Assignment 7. Again, we will use the “latest” System-on-Chip Environment (SCE) version from 2012 (and later).

```
source /opt/sce/bin/setup.csh
sce &
```

2. Task: Implement the MP3 Decoder in SCE down to an ISS Model with dedicated hardware acceleration

For your SoC implementation, load your project file and resume your design space exploration with the goal of meeting the timing and minimizing costs.

The detailed instructions on the model refinement steps are the same as for Assignment 7. Please refer to those or the text document on the server in file: **/home/eecs222/EECS222C_S13/Assignment8.txt**

As deliverables for this assignment, submit again the final **`ISS.sir`** model and note the estimated/simulated frame delays in a table as follows:

Refinement Step	Model	Decode time per frame
Profiling estimation	Spec	
Architecture Refinement	Arch	
Scheduling Refinement	Sched	
Network Refinement	Net	
Transaction-Level Refinement	TLM, TLM_C	
Pin-Accurate Refinement	PAM	
Instruction Set Simulation	ISS	

For submission, convert your table into a PDF file. Name the PDF file **`ARM7plusHW_Evaluation.pdf`**, place it into your **`hw8`** directory, and make it readable for the submission script. Make the final **`ISS.sir`** file readable as well.

```
chmod 644 ARM7plusHW_Evaluation.pdf
chmod 644 ISS.sir
```

Use exactly these filenames, otherwise you can't submit.

3. Submission:

For this assignment, submit the following deliverables:

```
ARM7plusHW_Evaluation.pdf
ISS.sir
```

The files should be placed in your **`hw8`** directory. Then, in its parent directory, enter **`turnin`**.

As in the previous assignments, the **`turnin`** command will locate the deliverables and allow you to submit them *before the deadline.*

Again, you can submit at any time before the deadline, *but not after!* You can also submit as many times as you want. Newer submissions will overwrite older ones.

Late submissions will not be accepted!

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