

## Assignment 5

**Posted:** May 10, 2013  
**Due:** May 17, 2013 at 12pm (noon)  
**Topic:** Profile the MP3 Decoder model in SCE

### 1. Setup:

This assignment builds upon the previous two assignments (data in your `hw3` directory). For submission purposes, we will create a symbolic link `hw5` that points to `hw3`, as follows:

```
ln -s hw3 hw5
cd hw5
```

Again, we will use the System-on-Chip Environment SCE version 2010. Run the setup script, as follows:

```
source /opt/sce-20100908/bin/setup.csh
```

To avoid incompatibility problems with other SCE versions (i.e. the version used in the tutorial), delete the `.sce` directory in your home directory before starting SCE:

```
rm -rf ~/.sce
sce &
```

### 2. Task 1: Profile the MP3 Decoder Model in SCE

We will resume the design flow by loading the SCE project file created in Assignment 4, as follows:

➤ **Project->Load "mp3.sce"**

Next, open the specification model and ensure that it properly compiles and simulates, as follows:

➤ Double-click on `spec.sir` in the project window  
➤ **Validation->Compile**

- **Validation->Simulate**

Profile the model using the SCE profiler, as follows:

- **Validation->Profile**

Browse the numerical profiling results obtained in the window on the right.

### **3. Task 2: Analyze the Profiling Results**

Rather than comparing the calculated statistics as numerical values, we can use the SCE bar chart display for graphical visualization. Compare the computational complexity of the behaviors in the model with the goal to identify those components that make good candidates for custom hardware acceleration.

As we have discussed, good candidates for hardware implementation are behaviors with short code, regular structure, and high computation load.

Identify those 8 behavior instances, that are the best candidates:

- Select the behaviors of interest in the hierarchy browser (use CTRL-Left-Click to select/deselect behavior instances)
- Right-click and select **Graphs->Computation**

When you have identified the 8 candidate blocks, print the computation bar chart of those:

- **Window->Print...** in color (!) to file **ComputationProfile.ps**

For submission, convert the generated PostScript file to PDF and make it readable for the submission script:

```
ps2pdf ComputationProfile.ps
chmod 644 ComputationProfile.pdf
```

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

### **3. Submission:**

For this assignment, submit the following deliverable:

```
ComputationProfile.pdf
```

The file should be placed in your `hw4` 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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