

ECED 4260 IC Design and Fabrication

Tutorial E: Debugging Hardware

Tutorial Material:

- Download **Debugging_Hardware_VHDL/Verilog.zip**, extract files to your work directory.
- Follow Tutorial: **Debugging of VHDL/Verilog Hardware Designs on Intel's DE-Series Boards**
- A copy of the pin assignment file (.qsf) can be downloaded from the course website, or you can add the pin assignments using the Pin Planner.

Submissions after the tutorial:

- A summary of what you have learnt from this tutorial
- Program the DE1-SoC board and run five reaction tests, what is your average reaction time?
- The result from **Section 4.2: SignalTap Logic Analyzer**. An example of the signal results is shown below.
- Study all HDL code provided. What is the exact time delay created by the “delay_counter”?

