

Simon Fraser University
School of Engineering Science
ENSC452/894: Advanced Digital System Design
Fall 2009

Project Guidelines

You will need to work on some aspects of the project before completing the modules since the proposal will be due the week before the Lab Demonstration. You should also try to become comfortable with a hardware simulator as your design work will require lots of simulation. If you do not like the one incorporated into ISE, you can use ModelSim (Lab m07 gives a tutorial on using ModelSim). A student version is available for download

The basic guideline is that your project should incorporate at least one MicroBlaze processor and a hardware block of your own design.

You will need a block diagram of your system. The example shown on the back of this page is fairly good. The only improvement that is required for it to be correct is to explicitly show the buses to which peripherals are connected (e.g. LMB, PLB). This would also better illustrate potential bottlenecks in the system. Any software IP could be indicated as blocks within the box labeled as the MicroBlaze processor.

Below is a list of projects that have been previously chosen for implementation on this board (just to give you an idea of what you could accomplish):

- A Karaoke Machine
- Guitar Sound Processing System
- AES encryption and Decryption
- Real-time User Adjustable Video Filtering
- A Light Vectoring Project: Image Capture and Processing
- Photoshop Functionalities on an FPGA
- Interactive Video Games (e.g. Duck hunt, Battleship, Snake, atomic handball, etc)
- AC97 Sound Controller and Device Driver

As a general comment, all these concepts are good, however, sometimes people have trouble just getting the basic stuff running, like the audio or video so they could not get to the next stage. Thus, be warned and don't assume that it's easy. Digilent (the company that makes the board has created numerous base designs to demonstrate the board's functionality. *HINT*: They are a great place to start, but be warned they are designed for the OPB bus (deprecated).

Further information on the Final Project Demonstration and Report will be given in a later handout.