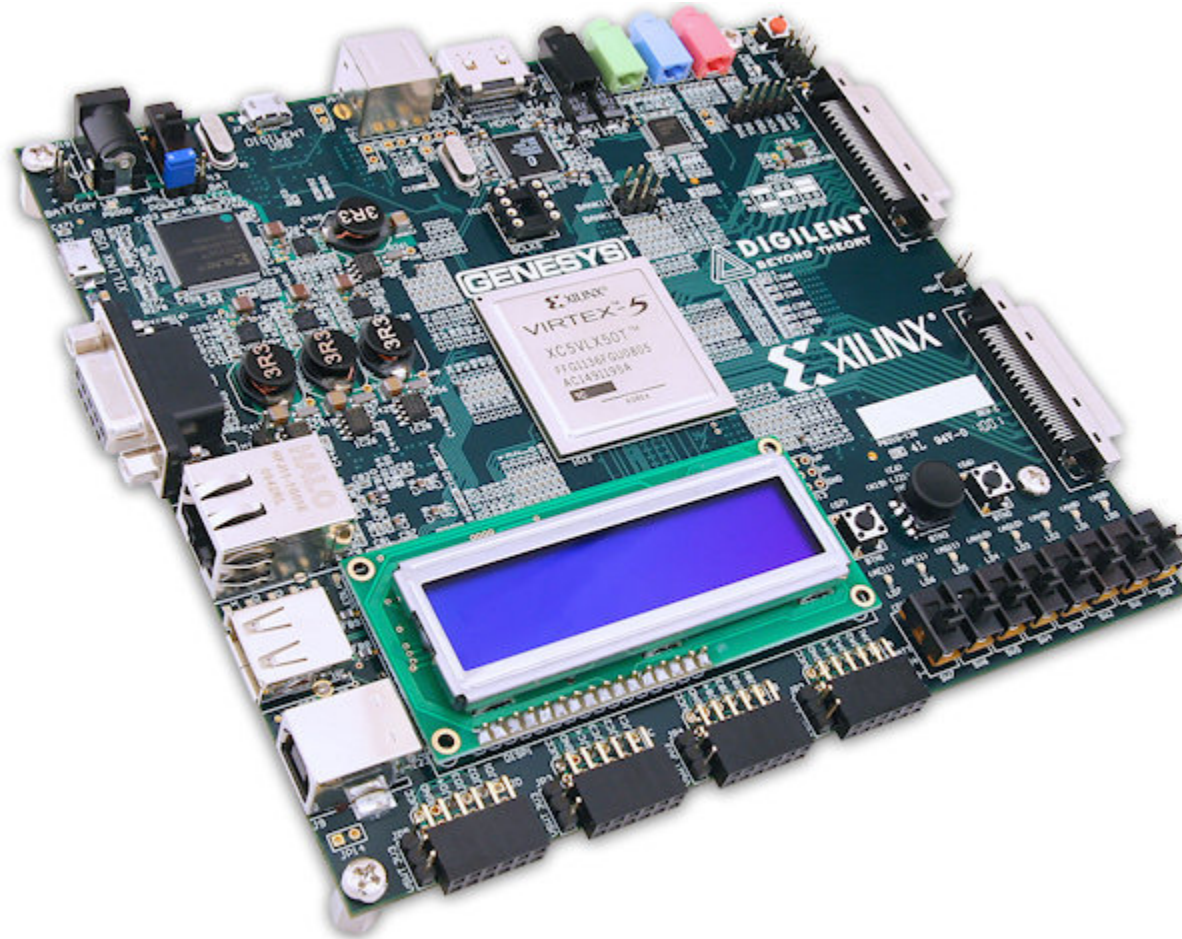# Embedded Systems Lab

1 Development Platform
Lab Assignments Summary

Development Board

"Genesys" FPGA development board by Digilent, Inc.

(Development Board)

The board is equipped with a Xilinx Virtex5 LX50T FPGA.
Features:

- General-purpose I/O hardware, including eight LEDs, two buttons, and a two-axis navigation button
- 16x2 character LCD display
- RS-232 serial port
- 10/100/1000 Ethernet PHY
- multiple USB2 ports for programming, data, and hosting
- 16Mbyte flash memory for configuration and data storage
- Audio and Video ports

There is a manual for the board available for download from the materials web page.

System-on-Chip
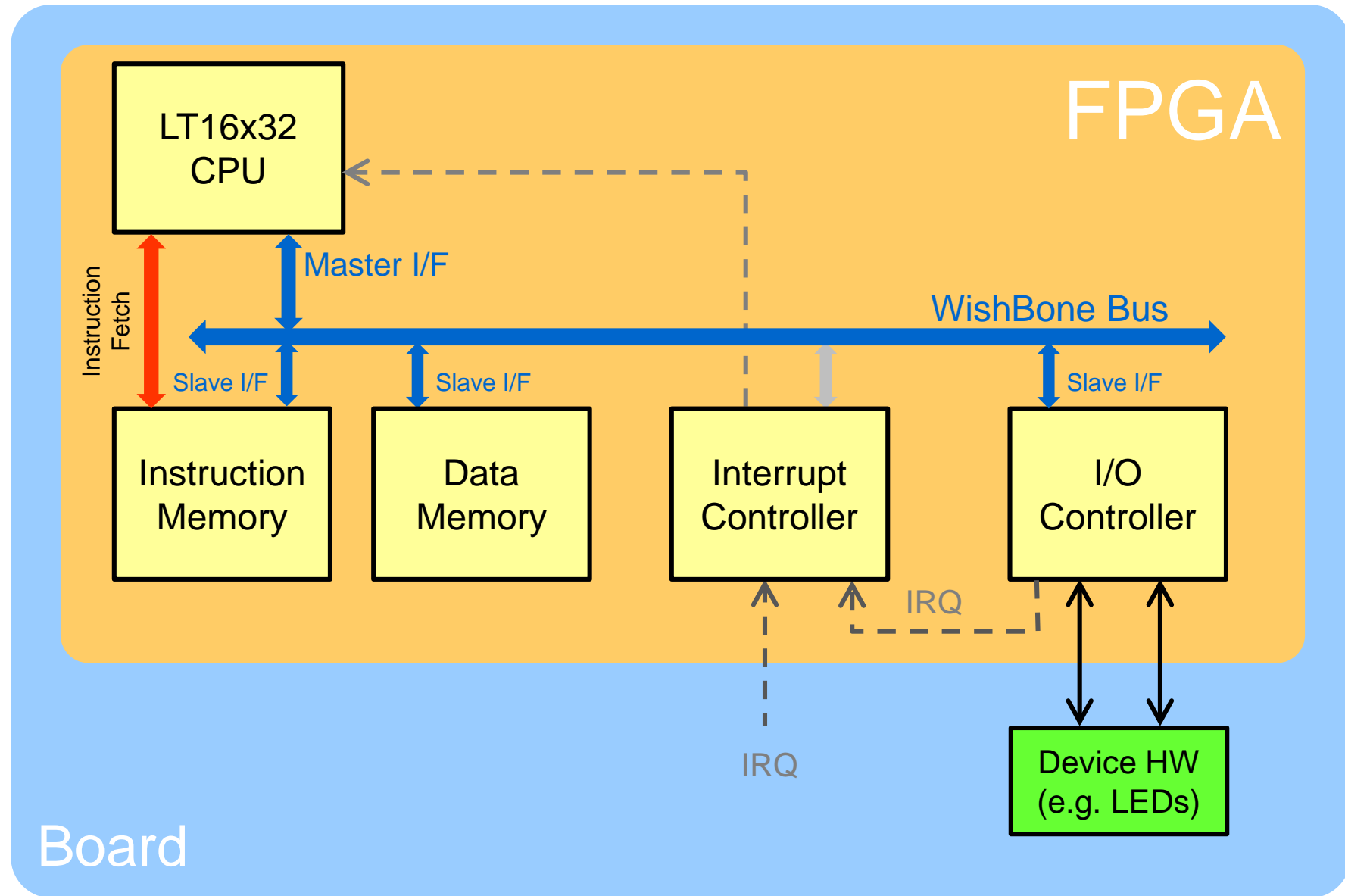
Development Platform

The hardware and the software for the SoC are developed on a PC running Linux.

- Hardware development is in VHDL using Xilinx ISE software.
- Software development is in assembler
- The FPGA is programmed using "Xilinx Impact" or "Digilent Adept" software through USB cable.

Warm-Up Experiments (Summary)

1. Set up your development environment. Walk through a complete build-and-deploy cycle.

2. Design a new I/O device and add it to the system. Modify and extend existing software.

3. Create a software API for an LCD controller. Move parts of the software functionality into a hardware device.

4. Write hardware and software using interrupts.

Design Project

Details on the design project and a specification will be given in a few weeks.

The design project will make use of all concepts introduced in the warm-up experiments.