FPGA Design

Introduction

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Objectives of the Training

• This is an introduction to FPGA design yet we will cover a large number of topics.

• Every topic will not be discussed in details, but knowing about them can help you in later developments to find information.

• We want to give you the basics that will allow you to continue on your own.
From Programming to Designing

• Most of you are used to work with high-level programming languages (C++, Python, Java, …).

• When designing for FPGAs, you should forget about programming!

• There are similarities but the approaches are different: programming is vertical, while designing is horizontal.
Programming

• A computer program is a list of instructions that are fed to a CPU.

• The workflow is vertical, it goes from one instruction to another.

• The architecture of the CPU defines what happens next, you have to follow that rule.
Designing

- In an FPGA design, components live next to each other and run simultaneously.

- Designing an FPGA is like building a circuit board: ICs run in parallel.

- There is no defined architecture that tells you what comes next. You have to define it.
Thinking Hardware

• To efficiently design for FPGAs, you need to think in terms of hardware.

• Everything you code will be translated to electronic components inside the FPGA.

• This has consequences on how your logic will run and is why we dedicate the first session to describing the hardware components that form an FPGA.
# Timetable

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Tools

• A virtual machine that holds all the required software is available for download. We recommend using VirtualBox to run the image.

• Link: http://iihe.ac.be/~tlenzi/res/VM.zip