ICTP-IAEA project presentation

By

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Outline

1.why did i apply for this school?

2.What have I learned?

3.My expectations

Why did i apply for this opportunity?

Previous work and Current projects

- PhD thesis: new technique of analog-to-digital conversion (ADC), based on FPGA-assisted optimal duty cycle modulation (ODCM).

- Current work (post-doc) : Electric signal analysis and processing (identification of the consumers on the electricity network)

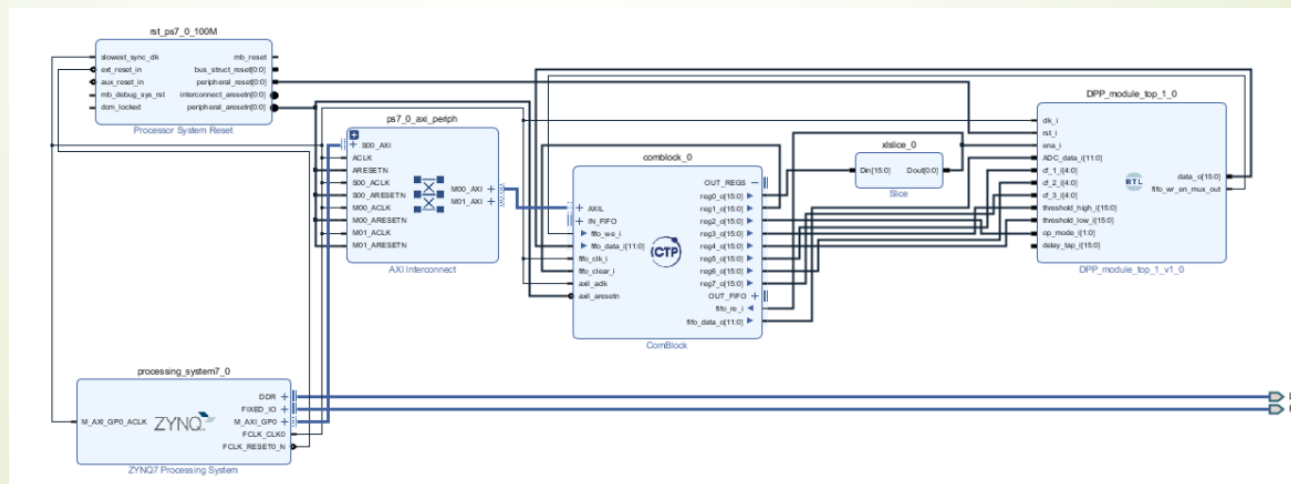## FPGA-based real time data acquisition
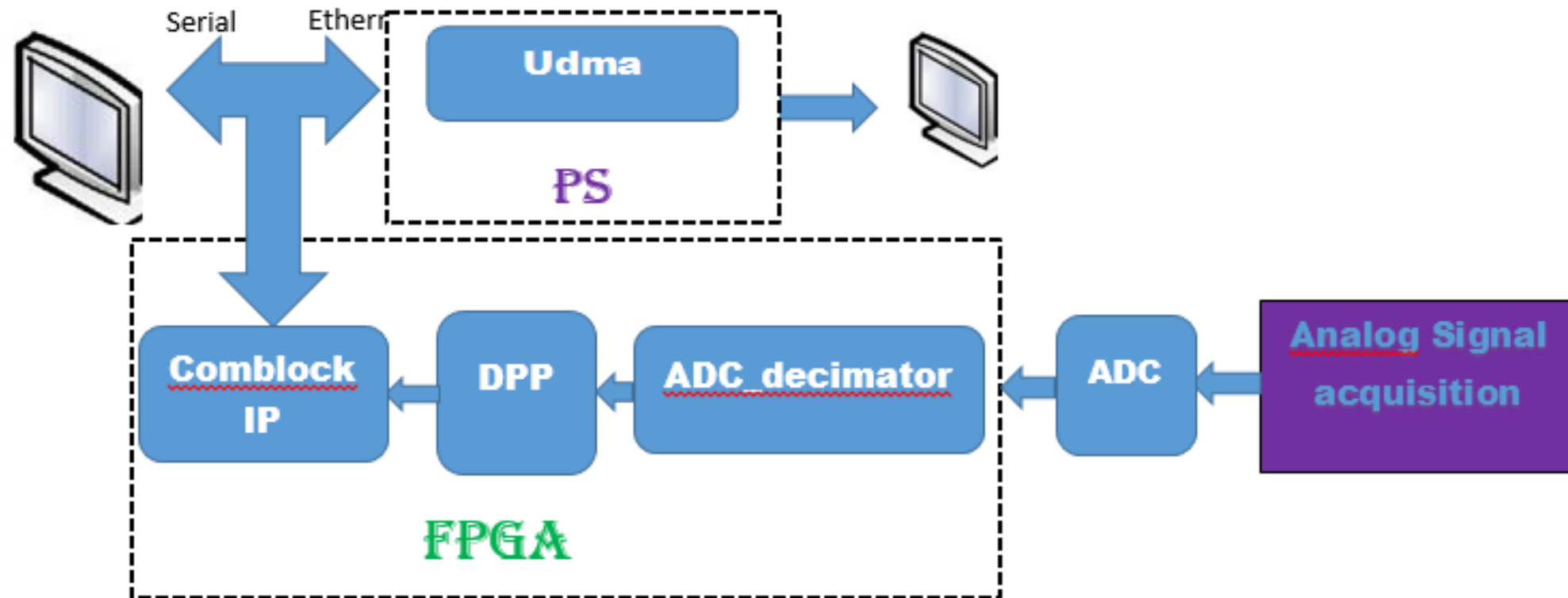
What i have learned

Digital pulse processing

The development of the dpp implementation has been driven by the following considerations: utilizing data parallelism and allowing application specific specialization while keeping functional flexibility and minimizing power consumption

Block diagram

Comblock IP

- **It is the communication block created to provide known interfaces such as registers, RAM, FIFO…to a user of the Programmable Logic, avoiding the complexity of the bus provided by the Processor System**

- **In this part, we have how to add a new IP core in the repository and use it in the block design**
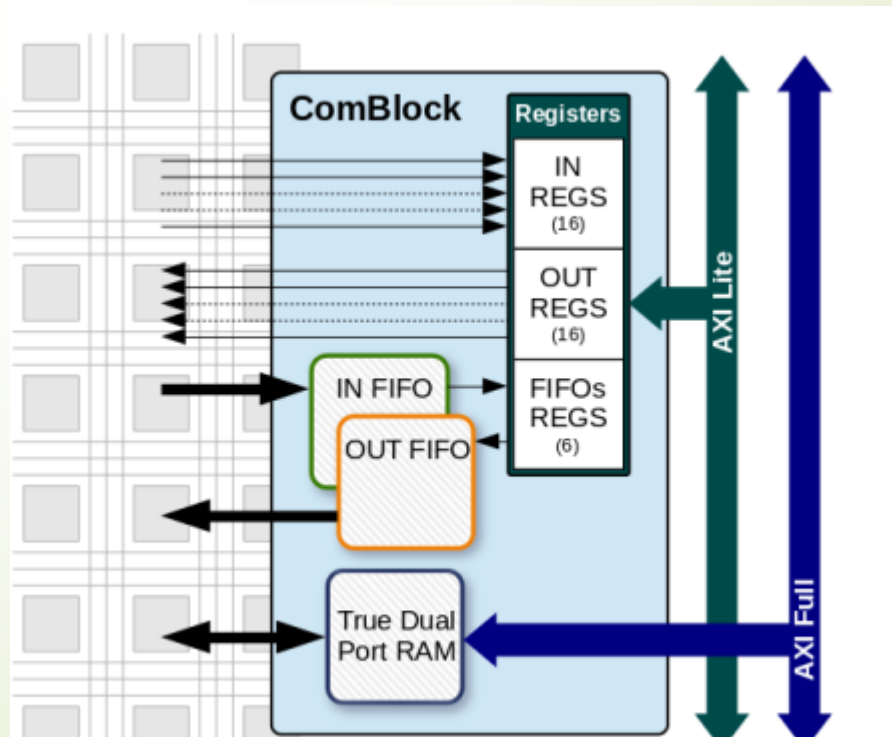
Adc_500 decimator/controller

- The adc_500 is a high speed ADC based in ADC08500 with a 500Mhz sampling frequency

- The method here for increasing the effective resolution of the ADC is oversampling and decimation. This technique involves oversampling of the input signal so that a number of samples can be used to compute a virtual result with greater accuracy than a single real sample can provide.

Final project
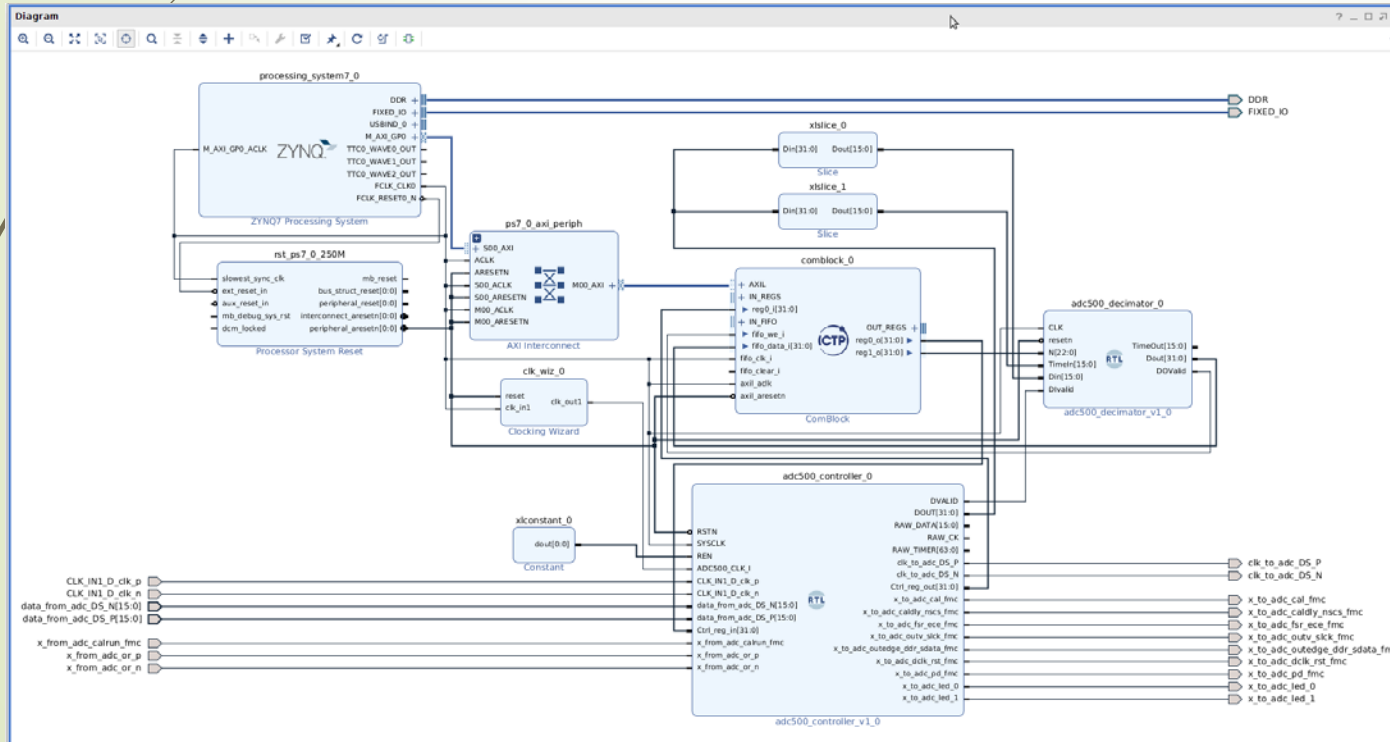
To summarize

- After this 4 weeks workshorps i can:
- Develop the main IP core using VHDL;
- Configure any IP core in Vivado;
- Using Vivado for designing, simulating and implementing;
- Emulating an operation using Zedboard;
- Writing and reading in the registers and FIFO;
- Doing data acquisition using Zedboard

My expectations

- Collaborate with ICTP and IAEA team after this school to developp RVI based on FPGA for my Lab and others Universities in my country
- Collaborate with other participants on different projects
- Applying what I have learned to improve my current work

Thank you for the whole ICTP and IAEA team

A special Thanks to the tutors for their technical assistant and their patience

Thanks for giving me the chance to be a part of this amazing workshops