Real Time Embedded Systems

Mini-Projects

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Mini-Projects RTES - Objectives

- Be able to define and realize :
  - A Multi-processor system
  - An accelerator or a custom instruction
  - Synchronization between 2 processors
  - Profiling
  - Hardware and Software design

Mini-Projects RTES – Projects idea

- Linux web server for FPGA services
- Camera on a Web server
- Pictures viewer on the FPGA from a Web server
- A SD card Reader/Writer, data on a Web server
- Audio In, processing, Audio Out
- Data logger of A/D, i2c, SPI interfaces
- Thermal Camera IR, could be stereoscopic
- LCD TFT24, VGA as display
- … your own idea

Mini-Projects RTES – Final work

- Groups of 2 students
- 2 groups can work together
  - A common report per group, with identified parts for each student
  - The full source of code (VHDL, C, …)
  - A final oral presentation
  - A demonstration

- During the mini-project you have to create and develop a multimaster system.
- One of the master is an ARM (baremetal coding or Linux) or NIOSII processor with a RTOS and could run as a Web server
- Another master can be a second ARM or NIOSII processor dedicated to real-time application, and will generate data for the 1st processor. It could be a specialized unit with DMA capabilities as an accelerator

- You have to propose your choice for the project and analyze the architecture for hardware design part and software. Specifically for synchronization between the processors.
- In all case, do a **profiling** of your project and analyze the performance of your system.
- Compare with a software only solution.