**PhD in Information Engineering**

**XXX Cycle**

**Software Defined Architectures for Radio Synthesis**

**Abstract**

Software based radio design, also called Software Defined Radio, has been attracting manufacturers for years, but technological limitations confined their diffusion to specific contexts (military communications). The technological barriers are now removed and the software design is rapidly becoming a common practice. The course will explore the main aspects related to software based signal processing for radio communication devices. Starting from some Open-Source framework for SDR, the course will describe the current and future programmable devices for signal processing, followed by an introduction to FPGA radio synthesis process with Xilinx tools, and finally closing with an overview of future trends on digital radio design.

Program:

* Day 1 - Framework and Hardware Open Source SDR (Gnuradio, Ossie, Redhawk, USRP, Nutaq)
* Day 2 – Examples of Radio Design (Ossie, Gnuradio, Nutaq) - Day 2
* Day 3 – Reprogrammable Devices (DSP, FPGA, GPP, ASIC e Ibridi) and FPGA Radio Synthesis (Xilinx tools) - Day 3
* Day 4 - From Firmware Defined Radio to Software Defined Radio on FPGAs – Day 4