Call for application for research scholarships

for post-graduate international candidates

RESEARCH PROJECT N. 28

Title

VLSI architectures for 5G communications

Scientific responsible (name, surname, role)

Maurizio MARTINA, Associate Professor (maurizio.martina@polito.it)

Short description of the research activity (max 250 words)

The complexity of 5G communication systems requires the design of VLSI architectures able to sustain high throughput with limited power consumption. The goal of this research project is to investigate VLSI architectures suitable for 5G communications. The main themes which will be considered for investigation are: Polar Codes and massive MIMO systems. The candidate will start from system/algorithmic models, developed in C/C++ or Matlab (which can be partially available) and will integrate them to include required but currently missing functionalities. Then, the candidate will modify them to obtain hardware oriented models. This can include, bit-accurate fixed point models. The models will also include state-of-art techniques taken from the literature and possibly novel ideas developed by the candidate. Finally, the work will concentrate on VLSI implementation (modeling, architecture optimization, validation, logic synthesis, place and route).

Specific requirements (experiences, skills)

The ideal candidate has some knowledge on digital communication and channel code decoding. Despite these skills are not mandatory they can be useful. Mandatory skills are i) digital integrated architecture design (VHDL and/or Verilog modeling), ii) simulation and verification of digital integrated circuits, iii) digital integrated circuits design flow in particular good skills with Synopsys Design Compiler and Cadence Encounter tools. Finally, the candidate should have strong motivation and interest for research and innovation.

Website of the research group (if any)

Keywords (min 3, max 6)

VLSI, Telecommunications, Digital Integrated Circuits, Polar codes, Massive-MIMO systems.

Research Area (max 1)

Electronics, Control and Telecommunication Engineering