ELECTRICAL, ELECTRONICS AND COMMUNICATIONS ENGINEERING

Acceleration of data center and embedded applications using FPGAs

Funded By	Dipartimento DET
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Context of the research activity	The goal of the research is to identify promising applications that can improve performance and energy efficiency by being implemented using FPGA platforms, investigate design methods that improve over the state of the art, and demonstrate their effectiveness using the selected applications.
Objectives	Several approaches have been defined in recent years to exploit the wider architectural exploration capabilities offered by reconfigurable logic with respect to parallel processors, thus leading to higher energy efficiency per computation. This is particularly significant for emerging applications such as complex machine learning models, as well as classical ones such as graph algorithms. However, design time is still a bottleneck because even state-of-the-art high-level synthesis tools for FPGAs require segnificant hardware design expertise. The thesis will thus investigate techniques aimed at better exploiting architectural aspects, such as on-chip RAMs and hardwired DSP units, while reducing the design time and effort.
Skills and competencies for the development of the activity	The candidate must have significant experience on: - HLS for FPGAs - C++ coding - hardware architectures