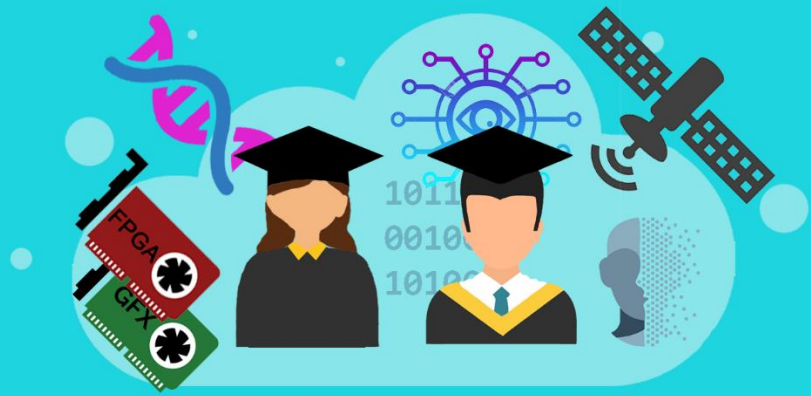


Diploma Thesis

Microprocessors and
Digital Systems
Laboratory



CONVONUTIONAL NEURAL NETWORKS FOR IMAGE PROCESSING ON FPGA PLATFORM

Nowadays, digital images and videos dominate in a variety of scientific (e.g., earth observation, bio-medical), consumer and industrial applications. The increased performance requirements of these applications pose a very computationally intensive signal processing with an increased amount of hardware resources. FPGAs provide increased performance/watt solutions with many custom parallel kernels, suitable for almost any kind of image processing algorithm. This diploma thesis aims at developing a high-performance convolutional neural network for image processing on a SoC FPGA (FPGA with integrated processor). The developed system will be capable of processing data captured from camera at real-time with high accuracy. The implementation will be based on SDSoC tool from Xilinx and HLS (High-level synthesis) programming approach.

PREREQUISITES

Basic knowledge of FPGAs and HDL language (VHDL, Verilog), Knowledge of C and MATLAB

CONTACT

Dr. George Lentaris (glentaris@microlab.ntua.gr)

Konstantinos Maragos, Ph.D. (komaragos@microlab.ntua.gr)

Prof. Dimitrios Soudris (dsoudris@microlab.ntua.gr)