Research Doctoral programs for the academic year 2021/2022 - XXXVII cycle

Title of the theme   Development of solutions for the generation of efficient FPGA-based computing architectures

Referent teacher   Santocchia Attilio

Tutors   Mirko Mariotti, Daniele Spiga

Giulio Bianchini

13/12/2021

Background

- 2017 - Bachelor's Degree in Computer Science (L-31)
    - Thesis: Creation of firmware for wireless connectivity for a reconfigurable calculation system
- 2020 - Master's Degree in Computer Science (LM-18) curricula: intelligent and mobile computing
    - Thesis: Faster R-CNN for points of interest recognition
- 2018 - 2020 scholarship at the Department of Physics and Geology of the University of Perugia
    - Development HUSH
    - Support IaaS Department of Physics and Geology UNIPG and INFN
- 2020 - 2021 employee at Netter SRL
    - Cloud computing, development IaaS on-premise
    - Backend developer

Integration of neural networks on FPGAs

State of art

FPGAs are playing an increasingly important role in the industry sampling and data processing

- highly parallel architecture
- low energy consumption
- flexibility in the use of customized algorithms

strong interest

Used for

Deep learning
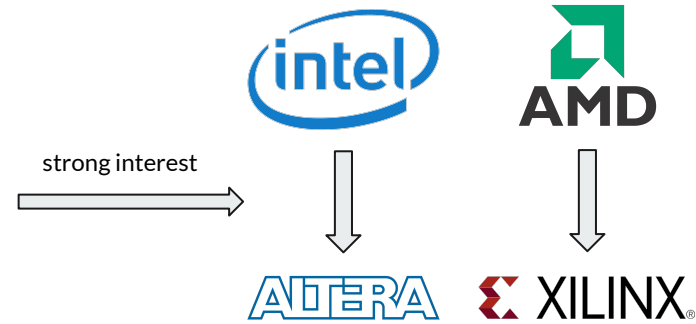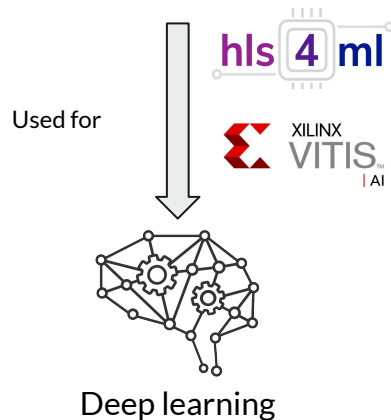
Integration of neural networks on FPGAs

Goal of the project

Enable the integration of a neural network on FPGA, starting from training up to its production in order to be subsequently used for data processing.

Open source software development
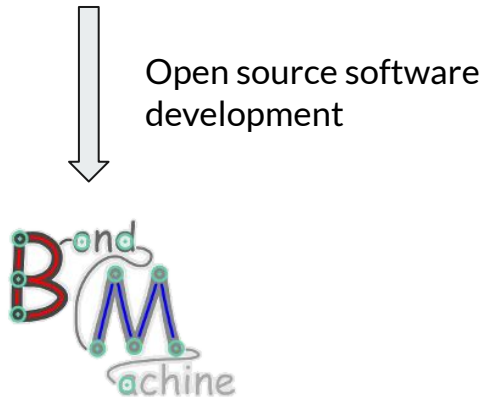
- A system that allows to use standard neural network models that can be integrated on FPGAs using BM

- Use through cloud services of a register of neural network models that will be pre-trained to perform a specific task.

- Development of custom algorithms for the design of custom hybrid architecture processors as CPU accelerator.

Thank you!

Giulio Bianchini

13/12/2021