FABRIZIO OTTATI

Digital hardware acceleration of deep learning inference

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RESEARCH TOPIC

Acceleration of **Spiking Neural Networks** (SNNs) on digital circuits. In particular, I am targeting FPGAs platforms, using **High Level Synthesis** (HLS), and focusing on computer vision tasks that take advantage of **event cameras**, which are novel vision sensors. I am also participating in **open source hardware** projects, designing ICs for Spiking Convolutional Neural Networks (SCNNs).

I am mainly interested in computer architecture and digital hardware design and characterization for deep learning inference. I like to live between the compiler and the architecture in the design stack.

PROJECTS

Open Neuromorphic

Open Neuromorphicis an organisation that promotes open source software and hardware in the neuromorphic computing research field.

Expelliarmus

expelliarmus is a library that allows to decode binary files generated by Prophesee cameras to NumPy structured arrays.

Tonic

Tonic provides publicly available event-based vision and audio datasets and event transformations.

Visiting researcher

Cognitive Systems and nodes - Professor Charlotte Frenkel

Feb 2023 - Sep 2023 Delft University of Technology

Design of an FPGA accelerator for the neuromorphic controller of an autonomous drone, in collaboration with MAVLab, led by Professor Guido De Croon.

PUBLICATIONS

- *To Spike or Not To Spike: A Digital Hardware Perspective on Deep Learning Acceleration*, Fabrizio Ottati et al., ArXiv, 2023.
- *NeuroBench: Advancing Neuromorphic Computing through Collaborative, Fair and Representative Benchmarking*, Jason Yik et al., ArXiv, 2023.
- *Custom Memory Design for Logic-in-Memory: Drawbacks and Improvements over Conventional Memories*, Fabrizio Ottati et al., ArXiv, 2021.

TECHNICAL SKILLS

Deep Learning | VHDL/Verilog | Python | C/C++ | Unix | Git | Computer Architecture | FPGA | High Level Synthesis

SOFT SKILLS

Leadership | Decision-making | Problem solving | Resourcefulness | Adaptability | Organisational | Openness to criticism

LANGUAGES

Italian
Mother tongue

English
IELTS 6.0

EDUCATION

PhD in Electronics and Telecommunications Engineering

Politecnico di Torino

Nov 2020 - ongoing

MSc in Electronic Engineering, Microelectronics

Politecnico di Torino

Oct 2017 – Apr 2020

Grade: 110/110 cum laude.
GPA: 29.6/30.

BSc in Electronic Engineering

Politecnico di Torino

Oct 2014 – Oct 2017

Grade: 108/110.
GPA: 27.93/30.