FABRIZIO OTTATI

Digital hardware design for neuromorphic computing

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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).

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.

EXPERIENCE

Visiting researcher

UCSC Neuromorphic Computing Group - Professor Jason Eshraghian

Oct 2023 - Dec 2023 University of California Santa Cruz

High Level Synthesis of digital circuits on Xilinx FPGAs for accelerating the inference of Spiking Neural Networks trained using snnTorch, developed by Professor Jason Eshraghian.

Visiting researcher

Cognitive Systems and nodes - Professor Charlotte Frenkel

Feb 2023 - Aug 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

- *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

Neuromorphic computing
VHDL/Verilog Python C/C++
Machine Learning IC design
High Level Synthesis FPGA
Unix TCL Git

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.