UNIMORE
UNIVERSITÀ DEGLI STUDI DI MODENA E REGGIO EMILIA

Dipartimento di Ingegneria "Enzo Ferrari"

Dipartimento di Scienze Biomediche, Metaboliche e Neuroscienze

Brain-Inspired Computing: From Neuroscience to Artificial Intelligence

October 11th, 2019 – 10:30 – 17:30
Aula Magna Centro Servizi Policlinico - Via del Pozzo 71 – Modena (MO)

The aim of the workshop is to explore different aspects of neuromorphic computing: from biologically realistic models for computation to synaptic and neuromorphic electronics to drive the latest generation of artificial neural networks.
Many industrial applications based on artificial intelligence (AI) have emerged and are all based on existing technology and computational paradigms. One of the main challenges for the future expansion of AI is to draw inspiration from the way human brain works in the development of new hardware and software emulating computation performed by neurons and synapses.
This workshop will address this issue in a highly interdisciplinary scenario. We will explore areas of research apparently distant such as experimental and computational neuroscience, electronics, and informatics maintaining a common thread given by the performances shown by the nervous system, from energy consumption to highly parallelized cognitive tasks.

10:00-10:15 **Registration**

10:15-10:30 **Opening**
Angelo Oreste Andrisano - Magnifico Rettore (Università di Modena e Reggio Emilia)
Carlo Adolfo Porro - Centro Interdipartimentale di Neuroscienze e Neurotecnologie (Università di Modena e Reggio Emilia)

10:30-12:15 **Session 1 - Experimental and computational Neuroscience (Chair: Jonathan Mapelli, Università di Modena e Reggio Emilia)**
Sergio Solinas (Università di Modena e Reggio Emilia, Modena, and Institute of Neuroinformatics (INI), Zurich)
"Inhibitory plasticity and optimal encoding at the cerebellum"
Thierry Nieus (Università degli Studi di Milano, Milano)
"Brain complexity measures and their extension to neural circuits and non-biological systems"
Alberto Mazzoni (Scuola Superiore Sant'Anna, Pisa)
"Tactile information processing: from models to neuroprosthetics and back"
Stefano Vassanelli (Università degli Studi di Padova, Padova)
"Connecting Brain and Silicon Neurons with memristive synapses"

12:15-13:30 **Lunch**

13:30-15:15 **Session 2 - Neuro-inspired electronics and hardware (Chair: Paolo Pavan, Università di Modena e Reggio Emilia)**
Sabina Spiga (CNR-IMM, Agrate Brianza)
"Emerging technologies and devices for neuroinspired architectures"
Francesco Maria Puglisi (Università di Modena e Reggio Emilia, Modena)
"Physics-based Compact Models to investigate new brain inspired architectures"
Daniele Ielmini (Politecnico di Milano, Milano)
"Hardware accelerators for computing and learning with memory arrays"
Giacomo Indiveri (Institute of Neuroinformatics (INI), Zurich)
"Neuromorphic electronic circuits for building neuromorphic cognitive agents"

15:15-15:30 **Coffee Break**

15:30-17:15 **Session 3 - Artificial Neural Networks (Chair: Simone Calderara, Università di Modena e Reggio Emilia)**
Concetto Spampinato (Università di Catania, Catania)
"AI for "reverse-engineering" computational patterns in the human brain"
Elisa Ricci (Università di Trento, Trento)
"Learning to Adapt: Digging Deeper into Domain Adaptation for Visual Recognition"
Marcella Cornia (Università di Modena e Reggio Emilia, Modena)
"Predicting Human Eye Fixations via Deep Learning-based Saliency Models"
Sabrina Conoci (ST Microelectronics, Catania, and Università di Messina, Messina)
"Driver Drowsiness by Silicon-based Physiological Sensors coupled with Neural Networks"

17:15-17:30 **Wrap-Up**

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