NeurONN: Neuromorphic Computing for Artificial Intelligence at the Edge
Stefania Carapezzi, Madeleine Abernot, Corentin Delacour, Nadine Azemard, Jérémie Salles, Thierry Gil, Aida Todri-Sanial

To cite this version:
Stefania Carapezzi, Madeleine Abernot, Corentin Delacour, Nadine Azemard, Jérémie Salles, et al.. NeurONN: Neuromorphic Computing for Artificial Intelligence at the Edge. 3rd AI Compute Symposium (IBM IEEE CAS/EDS), Oct 2020, Zurich (virtual), Switzerland. lirmm-03009213

HAL Id: lirmm-03009213
https://hal-lirmm.ccsd.cnrs.fr/lirmm-03009213
Submitted on 17 Nov 2020

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers. L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
NeurONN: A Novel Paradigm in Neuromorphic Computing for Artificial Intelligence at the Edge

Stefania Carapezzi, Madeleine Abernot, Corentin Delacour, Nadine Azemard, Jeremie Salles, Thierry Gil and Aida Todri-Sanial
Microelectronics Department, LIRMM, University of Montpellier, CNRS, Montpellier, France

The European H2020 NeurONN project (www.neuronn.eu) is dedicated to implementing a novel brain-mimicking paradigm based on Oscillatory Neural Network (ONN) computing systems [1-2]. In the ONN architecture, vanadium dioxide-based oscillators are used to emulate “neurons” and molybdenum disulfide (MoS2) memristors to emulate “synapses”. The goal is to realize original energy-efficient neuromorphic structures for “Artificial Intelligence at the Edge” devices (e.g. IoT applications, autonomous driving systems, medical implanted devices, robotics, etc.…). The innovative computing paradigm with ONN hardware is embodied in the encoding of information in the phase of oscillations rather than in their amplitude, allowing for a remarkable reduction of power consumption.

References: