

Master and Engineer Internship: 2020-2021

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Research group : CSAM / ANODE

Title : Neuromorphic Radio Frequency Receiver for Embedded AI applied to IoT

Abstract :

The objective is to achieve a real breakthrough in the field of the Internet of Things by means of an new approach inspired by biology, an approach which will be carried out on the basis of a CMOS technology with industrial maturity. The main objectives are to study, optimize and to create a completely integrated neuromorphic system with a very small footprint (a few mm²) which will present all the functionalities of a communicating sensor, which will be able to develop through learning cognitive functions such as recognition and classification of stimuli (visual, electromagnetic, ...) perceived by the sensor in its sound immediate environment.

Locks to be lifted :

Motivations are to achieve record energy efficiency (reduction by a factor of one thousand of current energy consumption) of communicating sensors and to create a complete system of new technology for transmitting information between sensors based on a bio-inspired process self-study. By mimicking biology, such a cognitive system will be able to function under extreme noise conditions and will take an essential step towards the systems autonomous, inspired by the living.

Context :

This subject is part of a context of valorisation of a patented technology in which several industrial players in AI are developing in collaboration with the IEMN UMR 8520 and the IRCICA USR 3380.