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Project: Cognitive Radio Digitizers for IoT Nodes (CORDION)

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More information at:

<https://www.ciencia.gob.es/portal/site/MICINN/menuitem.dbc68b34d11ccbd5d52ffeb801432ea0/?vgnextoid=490233572bed4710VgnVCM1000001d04140aRCRD>



Project Description

The so-called Cognitive Radio (CR) technology allows communication systems to make a more efficient use of the electromagnetic spectrum, by dynamically modifying its transmission and reception parameters according to the information sensed from the environment a technique also referred to as spectrum sensing. One of the direct consequences of the physical implementations of CR-based terminals is that the digitizers, i.e the circuits responsible for transforming the signal from the analog to the digital domain, should be placed as close as possible to the antenna, so that most of the hardware is digital and hence, it is easier to program via software. Another key technology enabler for the development of CR-based IoT nodes is the need to embed a certain degree of Artificial Intelligence (AI), so that they can set their specifications in an optimum and autonomous way, according to the environment conditions (communication coverage, spectrum occupancy, interferences), battery status and energy consumption.

In this scenario, this project aims to address some of the design challenges for the increased in-coming digital-driven world. To this end, AI-managed digitizers for CR-based IoT nodes will be developed. Although the project will cover design considerations of the whole communication system, the physical design will focus on the digitizer, as an essential key building block of IoT devices. For the realization of the proposed digitizer, a 28-nm technology will be used, and a complete demonstrator will be implemented in order to experimentally validate the proposed techniques.

