Proposition de recherche doctorale

A Cognitive Radio Transceiver dedicated to IoT and 5G

Mots clés :

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- Co-encadrant(s) :
- Unité de recherche : Laboratoire d'informatique de Paris 6
- Ecole doctorale : École Doctorale Informatique, Télécommunications, Électronique de Paris
- Domaine scientifique principal: Divers

Résumé du projet de recherche (Langue 1)

The future 5G wireless communication systems require portable devices capable of analyzing the spectrum congestion and establishing communication on the available frequency bands using the appropriate standards. Internet of Things (IoT) applications also require transceivers capable of establishing a wireless communication using several standards in order to communicate with a wide range of wireless sensors and actuators. At UPMC, we have proposed a new low-power RF receiver architecture suitable for portable devices dedicated to cognitive radio application [Haghighi2015]. This architecture is based on an RF bandpass Sigma-Delta ADC [Ashry2013]. The proposed receiver architecture achieves very good results compared to the state of the art. The objective of this thesis is the design and implementation of a power efficient cognitive radio transmitter that is capable of operating at different center frequencies and for several wireless communication systems. The Ph.D. student will also collaborate with other team members in order to build a complete cognitive radio transceiver. These circuits will be designed and implemented in a 65nm CMOS process. [Ashry2013] A. Ashry and H. Aboushady, "A 4th order 3.6GS/s RF Sigma-Delta ADC with a FoM of 1pJ/bit", IEEE Transactions on Circuits and Systems I, TCAS-I, Vol.60, No. 10, pp 2606 - 2617, October 2013. [Haghighi2015] D. Haghighitalab, "Highly Digitized Receiver for SDR Applications", Ph.D. Thesis, University of Pierre and Marie Curie, September 2015.

Résumé du projet de recherche (Langue 2)

This work requires a strong background in RFIC design in CMOS technologies.

Informations complémentaires (Langue 1)

In this topic, the LIP6 collaborates with several european industrial partners as well as research institutes in Mexico.