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HIGHER TECHNICAL SCHOOL OF
TELECOMMUNICATIONS ENGINEERING



FINAL THESIS REPORT

M.S. Degree in Telecommunication Engineering

DEVELOPMENT OF A MULTIPLE RF
INTERFACED PLATFORM FOR COGNITIVE
WIRELESS SENSOR NETWORKS

Agustín Tena García

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FINAL THESIS REPORT

Title: DEVELOPMENT OF A MULTIPLE RF INTERFACED
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WORKS

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DEVELOPMENT OF A MULTIPLE RF INTERFACED PLATFORM FOR COGNITIVE WIRELESS SENSOR NETWORKS

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Dedicatoria

Acknowledgements

Abstract

Nowadays Wireless Sensor Networks (WSNs) are subject to development constraints and difficulties such as the increasing RF spectrum saturation. This brings hindrances to Wireless Ad-Hoc Sensor Networks (WAHSNs) deployment, especially for critical and sensitive applications.

Cognitive Networks (CN), leaning on a cooperative communication model, represent a new paradigm aimed at improving wireless communications. Cognitive Wireless Sensor Networks (CWSNs) compound cognitive properties into common WSNs, developing new strategies to mitigate difficulties arising from the constraints these networks face regarding energy and resources.

It is important to investigate cognitive models to explore their benefit over our WAHSNs. However, few platforms allow their study due to their early research stage, and they still show scarce or specific features. Investigations take place mainly over simulators, which provide partial and incomplete results.

This paper presents a versatile platform that brings together cognitive properties into WSNs. It combines hardware and software modules as an entire instrument to investigate CWSNs. The hardware fits WSN requirements in terms of size, cost and energy. It allows communication over three different RF bands, becoming the only cognitive platform for WSNs with this capability. Besides, its modular and scalable design is widely adaptable to almost any WAHSN application.

KEY WORDS: *cognitive, wireless sensor networks, platform.*

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