COLLEGE OF ENGINEERING & TECHNOLOGY

Department: Electronics and Communications Engineering, Cairo

Graduation Project Description Form

Project Supervisor: Prof. Hesham ElBadawy

Project Title: Spectrum Sensing and Management

Duration from mo/year 9/2013____till mo/year 7/2014_____

Product Category

Algorithm____ Hardware____√ Software_____

Standards:

Safety: UL, CE_____ IEEE √_____ FCC__

Other _____

Practical Realization Form

PCB _____ Firmware___ Embedded CPU Kit (ARM, ..etc):_____

PC Software _____ Ready-made Package_____ DSP Kit____ FPGA Kit__√ (USRP Kits)

VLSI Schematics ____ VLSI Layout _____ VLSI Silicon (ASIC)_____

Language

VHDL/Verilog_____ Matlab √_____ C/C++/Java _____

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Productization

Finished Product Form: Circuit Possible Commercialization YES__

Amount of Funds Needed for buying components: 1000LE_____

Testing

Functional___√ Simulation___ Parameters___ Final Hardware_____√

Lab Test Setup

EMC √_____ Environmental_ Microwave _____ Analog Lab_

CAD Tools *(No unauthentic software is allowed):*

Elective Classes Required:

NO

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Abstract

Nowadays, Cognitive radio is a not completely utilized technique but rapidly developing technology area. CR allows more efficient use of spectrum, because CR will enable new systems to share spectrum with existing legacy devices, with managed degrees of interference. The SDR provides an efficient and comparatively inexpensive solution to the problem of building multi band and multi-functional wireless devices that can be enhanced using software. The project will focus on receiving TV band and FM band. Finally, the spectrum sensing process will be investigated. Then, the project will try to deploy the CR principle in proposing a spectrum management process in a certain band.

The aim of this project is to:

This project aims to the installation, operation, and testing of a multi-band SDR based Cognitive Radio System. This USRP units work at different frequencies such as: GSM 900, DCS 1800, and UMTS 2100 simultaneously. The main steps that may be followed in this project are as follows:

- Understanding cognitive radio concept.
- Analyzing hardware components aiming for efficient implementation.
- Intstalling software-defined radio package on Linux based system.
- Receiving TV and FM bands.
- Transmission and Reception between two USRP Units
- Spectrum sensing.
- Spectrum Management Proposal

Number of Students:

- The project group will be 4 students

References and Links