



COLLEGE OF ENGINEERING & TECHNOLOGY

Department: Electronics and Communications Engineering, Cairo

Graduation Project Description Form

Project Title: **MIMO and Smart antennas Techniques for 4G Cognitive Radio systems**

Duration from mo/year _____ till mo/year _____

Project Supervisor(s): **Prof. Dr. Said E. El-Khamy**

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 _____

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

Language

VHDL/Verilog _____ Matlab _____ C/C++/Java _____

Productization

Finished Product Form: _____ Possible Commercialization _____

Amount of funds needed for buying components: _____

IEEE GOLD Made-In-Egypt/Engineering Day: _____

ITAC (ITIDA) or NTRA Funding Application: _____

Testing

Functional _____ Simulation _____ Parameters _____ Final Hardware _____ Other: _____

Lab Test Setup

EMC _____ Environmental _____ Microwave _____ Analog Lab _____ Other: _____

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

Elective Classes Required:



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Abstract

Cognitive Radio (CR) is one of the main 4G technologies meant to make use of unoccupied licensed frequency bands which belong to a primary user by secondary users to make efficient use of the scarce spectrum. Multiple antennas at the receiver and transmitter (MIMO) and smart antennas are of the main techniques used to optimize the operation of multiple secondary users in a CR environment and to combat the effect of fading. The project will study these techniques and evaluate their performance through detailed analysis and MATLAB simulations.



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References and Links