Arab Academy for Science & Technology
and Maritime Transport – Cairo Branch
College of Engineering & Technology

Electronics & Communication Engineering Department

Project Title:

Spectrum Sensing in Cognitive Radio Systems

Introduction:

The innovative communications services and applications imposed by ever increasing customer demands render necessary the development of efficient radio resource utilization techniques. The whole process of planning and managing a reconfigurable network must be reconsidered, in order to live up to the expectations created by the migration towards a new era of communications. This project deals with such issues, emphasizing the role of new engineering technologies in reconfigurable networks. For this purpose, it presents the respective Spectrum Management via the usage of Radio Cognitive approaches.

Project Objectives:

The objective of this project is to get hands on and understand cognitive radio systems function and applications. This will be done via the operation practically in the AAST communications Lab on the USRP modules. So, the project team members will present a survey on different sensing dimensions and sensing algorithms. Students will be able to identify challenges associated with spectrum sensing algorithms.

Project Outcomes:

Upon successful completion of this project, the student should be able to:

- *Literature review of cognitive radio system*
- *Comparison of spectrum sensing dimensions and algorithms*
- *Select a standard to be used in bench testing via the USRP modules*
- *Spectrum sensing simulation using energy detection algorithm*

Students Rule:

- The project group will use and implement a complete test bench by the aid of USRP for different spectrum sensing case studies.
- Project team may be 4 students or less
- Team members will be able to use of Matlab files and USRP Linux Tools.

Project Supervisor:

- Name: Associated Prof. Hesham ElBadawy
- email: *heshamelbadawy@ieee.org*