

# USRP based Cognitive Radio Test-bed using OpenBTS

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# Problem Statement

- ▶ To develop a testbed for cognitive radio demonstrating coexistence of primary (licensed) users and secondary (unlicensed users)
- ▶ A two frequency testbed (channels used 945 MHz and 955 MHz)
- ▶ A four frequency testbed (936 MHz, 943 MHz, 950 MHz, 957 MHz)

# Overview of the tasks accomplished in our project

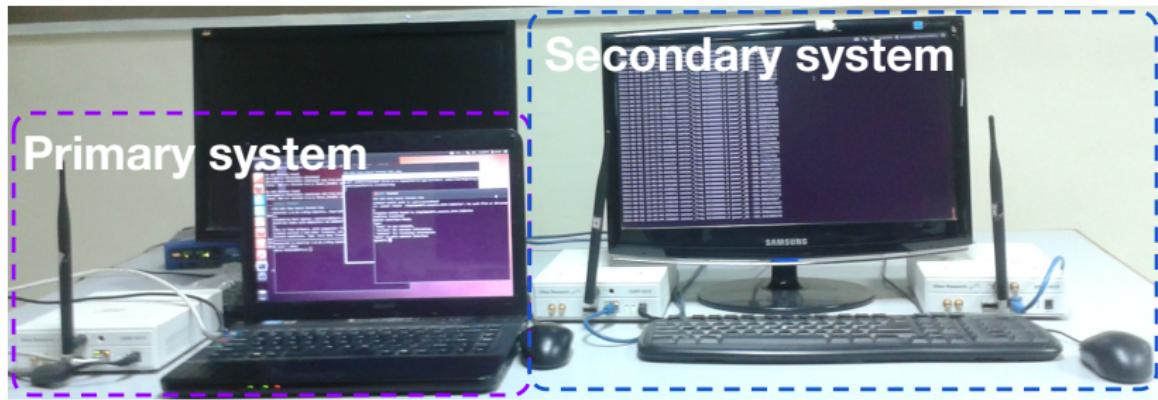
- ▶ Cognitive radio?, spectrum holes?
- ▶ GNURadio
- ▶ Python programming language
- ▶ USRP kit
- ▶ OpenBTS
- ▶ Calls and SMS service on local network
- ▶ Spectrum sensing techniques
- ▶ Defining problem statement

- ▶ Developing a flow chart of the solution to this problem
- ▶ Running GNURadio and OpenBTS on the same computer at the same time
- ▶ Bash scripting ( .sh files)
- ▶ Periodogram analysis
- ▶ Building a two frequency cognitive radio test bed
- ▶ Building a four frequency cognitive radio test bed

# Hardware and software used

- ▶ GNURadio
- ▶ OpenBTS
- ▶ USRP N210 Kits
- ▶ GSM mobile phones with SIM cards
- ▶ Computers

# Setup for the two-frequency testbed



# Setup for the four-frequency testbed

