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

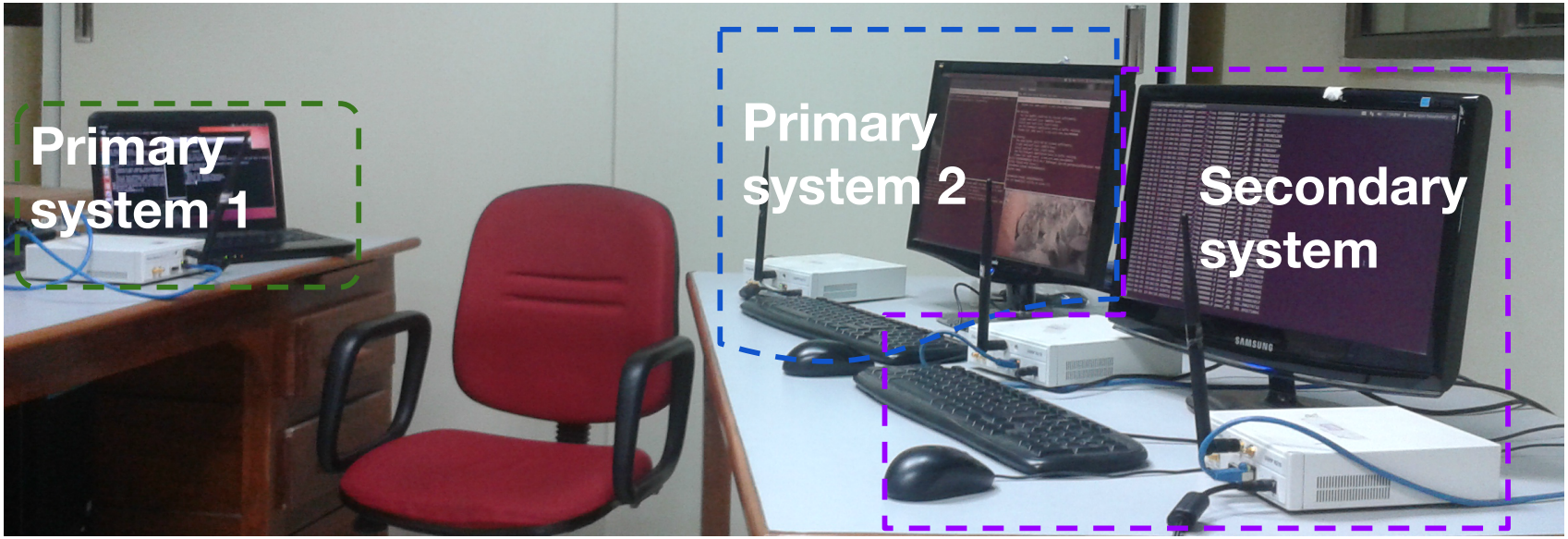
- Developing a flow chart of the solution to this problem
- Running GNURadio and OpenBTS on the same computer at the same time
- Bash scripting (.sh files)
- Periodogram analysis
- Building a two frequency cognitive radio test bed
- Building a four frequency cognitive radio test bed

Hardware and software used

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

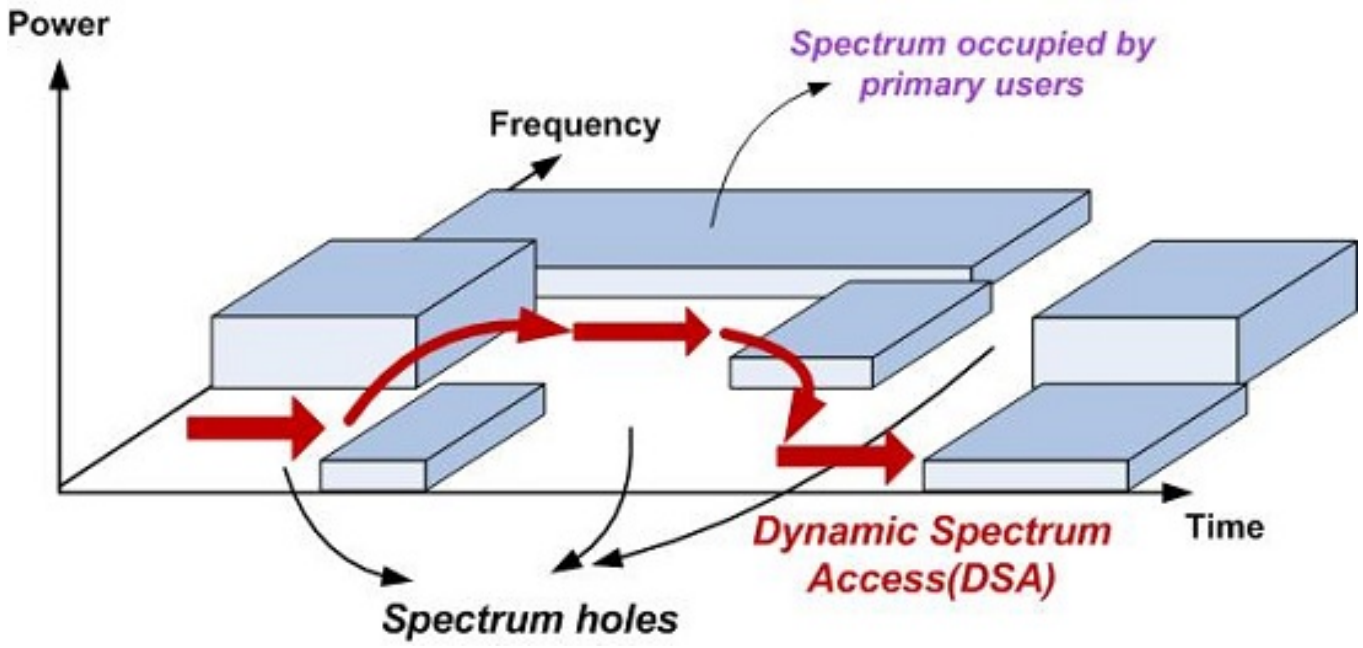
Setup for the two-frequency testbed

Setup for the four-frequency testbed



Cognitive Radio

- What is Cognitive Radio?



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