

Software Define Radio (SDR)

Background

A software defined radio (SDR) moves many traditional radio functions from hardware components into software functions running on general purpose processors (GPPs), digital signal processors (DSPs), and field programmable gate arrays (FPGAs). In a SDR, digitizing the received data and converting transmissions to analog (on transmit) occurs as close as possible to the antenna leaving most radio functions programmable and thus easily changed as needed (e.g. changing waveforms). This effort is a continuation of last quarter's project.

Project

The objective of this project is to implement a SDR using GNU Radio and the Universal Software Peripheral (USRP) hardware motherboard with RF daughterboard. The project will involve the following:

The project will evolve in the following stages:

- Problem definition. A survey should be conducted of the literature related to SDR, GNU Radio, and the USRP. Develop the specifications of a radio to be implemented.
- System design. Based on the radio specifications developed above, design the SDR and select appropriate hardware for the implementation.
- Hardware/software implementation. Implement the wireless transmission/reception system for laboratory testing.
- System testing. Carry out testing of the wireless transmission system.
- Report. Summarize the entire evolution of the project and conclusions in a final report.

References

<http://gnuradio.org>

<http://www.ettus.com>