

Event Title :

Exploring Software Radio using GnuRadio and USRP

Rationale :

New wireless standards and protocols are emerging frequently making wireless communication to develop at a furious pace. Every new technology demands for upgrade/replacement of the existing hardware/Software. Some reconfigurable/adaptable hardware/Software is required which can keep away the existing hardware and Software Radios becoming obsolete. The hardware/Software devices shall also be capable of doing multimode operations i.e. voice, video, data, different packet structures, different modulation schemes, different signal processing techniques. A Software Radio fulfills all these demands i.e. reconfigurable hardware/Software. The same piece of hardware can perform different functions at different times. Software Radios are able to change their physical layer behavior significantly through changes in its Software.

GNU Radio is a free & open-source Software development toolkit that provides signal processing blocks to implement Software Radios. It can be used with readily-available low-cost external RF hardware to create Software-defined Radios. It is widely used in hobbyist, academic and commercial environments to support both wireless communications research and real-world Radio systems.

The Universal Software Radio Peripheral (USRP) products are computer-hosted Software Radios. The USRP product family is intended to be a comparatively inexpensive hardware platform for Software Radio, and is commonly used by research labs, universities, and hobbyists. USRPs are commonly used with the GNU Radio Software suite to create complex Software-defined Radio systems.

** Both GnuRadio Software and the hardware schematic for USRP are open source/schematic.

Session outline :

1. Introduction to Software Radio.
2. Software Radio and GnuRadio
3. Introduction to USRP family
4. Basics of GnuRadio (with little bit explanation of python)
5. Demo of Common examples with GnuRadio and USRP
6. Future of Software Radio
7. Questions & Answers

Specific topics of interest :

Cognitive Radio, Software Radio, Wireless Sensor Network, OFDM, OpenBTS

Short biography :

Mr. Sumit Kumar is pursuing his MS(ECE) from IIIT Hyderabad. His area of interest is Software Radio, Cognitive Radio, Wireless Sensor Networks.