

## DUAL DEGREE PROJECT

### Implementation of cognitive radio on the USRP kit — June 2013 - till date

*Guide: Prof S N Merchant, Dept. of Electrical Engineering, IIT Bombay*

- Carried out energy detection spectrum sensing to find the lowest energy frequency band.
- Set up calls and messages on a software defined GSM network named OpenBTS.
- Carried out a field testing of an OpenBTS network to check the interference with other nearby networks.
- Working on a cognitive OpenBTS system.

## PROGRAMMING SKILLS

**Languages:** C, Matlab, Python, bash scripting, Assembly for the Intel 8080 microprocessor, Octave, Verilog, Ruby, SQL, XML.

**Operating systems:** Unix, Linux and Mac OS X.

## COURSE PROJECTS

### Scalable video coding using wavelets — Feb-Apr 2013

*Guide: Prof V M Gadre, Dept. of Electrical Engineering, IIT Bombay*

- Compressed three different spatial resolutions of a video together into a single bitstream
- At the receiving end, uncompressed the best resolution for the bit rate available.

### Principal Component Analysis in face recognition — Oct-Nov 2012

*Guide: Prof V Rajbabu, Dept. of Electrical Engineering, IIT Bombay*

- Implemented an iterative algorithm of using PCA in face recognition.

### Design and test an algorithm for restoring a brain image — Sep-Nov 2012

*Guide: Prof Arjun Arunachalam, Dept. of Electrical Engineering, IIT Bombay*

- Implemented an algorithm to remove noise artifacts from a brain image.
- Used the non-linear conjugate gradient method to optimize the estimate.

## **A simple AM voice Transmitter — Aug-Oct 2011**

*Guide: Prof S N Merchant, Dept. of Electrical Engineering, IIT Bombay*

- Developed an AM voice transmitter with a carrier frequency of 1 MHz, taking input from a music player via a 3.5 mm jack.

## **Mini UID for IIT Bombay Campus — Oct-Nov 2009**

*Guide: Prof Deepak Phatak, Dept. of Computer Science and Engineering, IIT Bombay*

- Automated fingerprint matching for the purposes of registration, verification and attendance.

## **SEMINARS**

### **Measurement of interference temperature — Jan-Apr 2013**

*Guide: Prof S N Merchant, Dept. of Electrical Engineering, IIT Bombay*

- Surveyed various ways of measuring interference temperature efficiently.
- Became familiar with the concept of Cognitive Radio.

### **Leds for high speed applications (over 100 Mbps) — Mar-Apr 2013**

*Guide: Prof Joseph John, Dept. of Electrical Engineering, IIT Bombay*

- Presented a seminar on how LEDs could be used for high speed fiber optic communications.
- LEDs are cheaper, rugged and safer to handle compared to laser diodes.

## **RELEVANT COURSES**

Digital Communications, Probability and Random Processes, Fibre Optic Communications, Communication Systems, Communications Lab, Network Theory, Advanced Computing for Electrical Engineers, Microprocessors.

## **EXTRA CURRICULAR**

- Secured a silver medal in the All India Computer Knowledge Competition 2006.
- '9/10' in the course EE 717: Advanced Computing for Electrical Engineers.
- **Organizer, Infrastructure Team**, Techfest 2010.
- **Social Service**: surveyed water and electrical resources of remote villages in Maharashtra.
- **Social Service**: taught math and physics to 6th standard students.
- **Interests**: Computer programming for technical problems, communications, problem solving, functional programming.