

## 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

**Programming Languages:** C, Matlab, Python, bash scripting, Assembly for the Intel 8085 micro-processor, 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

### One way selective data transmission | Mar-Apr 2011

*Guide: Prof Udayan Ganguly, Dept. of Electrical Engineering, IIT Bombay*

- Designed a Verilog based system to send data to multiple locations selectively and implemented it on a CPLD board

### **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

### **LED's 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 LED's could be used for high speed fiber optic communications. LED's are cheaper, rugged and safer to handle compared to laser diodes

## **RELEVANT COURSES**

### **Communications**

Digital Communications, Fibre Optic Communications, Communication Systems, Communications Lab, Network Theory, Probability and Random Processes

### **Computing**

Advanced Computing for Electrical Engineers, Microprocessors, Microprocessors Lab, Computer Programming and Utilization

### **Signal Processing**

Advanced Topics in Signal Processing, Wavelets, Speech Processing, Image Processing, Digital Signal Processing, Signals and systems

## **EXTRA CURRICULAR**

- Won 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, wireless applications, problem solving, functional programming