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 using Python
- 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

General purpose: C, Python, Assembly for the Intel 8085 microprocessor, Verilog, Ruby
Numerical computing: Matlab, Octave, SciPy
Miscellaneous: bash scripting, SQL, XML, Javascript, LaTeX
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 using Matlab
- 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 using Matlab

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 using Matlab
- 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

KEY COURSE ASSIGNMENTS

Course: Advanced computing for electrical engineers | **Sep 2012**
Guide: Prof Virendra Singh, Dept. of Electrical Engineering, IIT Bombay

- Implemented stack, queue, double ended queue, linked list, doubly linked list, self-adjusting lists
- Implemented 2-3 tree, splay tree, huffman tree and AVL tree
- Used C programming language for the implementation

Course: Speech Processing | **Autumn 2012**
Guide: Prof Preeti Rao, Dept. of Electrical Engineering, IIT Bombay

- Synthesized speech signals using Matlab and used DTFT to analyze them
- Analyzed speech signals using Linear Prediction and also re-synthesized them.
- Estimated the pitch of a speech signal using Cepstrum estimation
- Used Praat software to extract speech signals from .wav files

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, Probability and Random Processes, Radiating Systems

Computing and math
Advanced Computing for Electrical Engineers, Microprocessors, Microprocessors Lab, Optimization Models, Optimization Techniques

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