Scholastic Achievements

- Received **Undergraduate Research Award** for outstanding research on Fractional Fourier Transform
- Awarded **Institute Academic Prize** for exceptional academic performance in the year 2013-14
- Completed Minor degree in **Mathematics** with CPI of 9.25 and currently pursuing Honors
- **One of 14** selected from India for **ITCSC-INC Winter School** 2014 organized by CUHK, Hong Kong.
- Ranked **28th** in India in **IIT JEE** 2011 exam taken by more than 500,000 students
- Secured **3rd rank** in **EAMCET** 2011 written by 300,000 students
- Won **Gold medal** in Indian National **Chemistry Olympiad** and attended the Orientation cum Selection Camp for International Chemistry Olympiad 2011
- Among the **Top 300** in the country to be selected for Indian national **Physics** olympiad and Indian national **Astronomy** olympiad.

Internships and Research Experience

Coded Modulation for Coherent Optical Communication Systems *May 2014 - July 2014*
Guide: Prof. LA Rusch, Centre d'optique,photonique et laser (COPL), Quebec

- **Simulated** 16 QAM coherent modulation for optical communication system in **MATLAB** and performed **Monte-Carlo** simulations to obtain BER vs OSNR curves for various lasers and signal constellations
- Collected raw data from back-to-back **experiments** and extracted phase data from raw data with offline carrier **Phase Recovery DSP** algorithms
- Analysed this data to evaluate the coding gain of **Multi-level coded modulation** (MLCM) for a constellation designed to mitigate ENOB limitations of DAC used in modulation

Fractional Fourier Transform and Chirp Parameter Estimation *May 2013– July 2013*
Guide: Prof. V.M.Gadre, IIT Bombay

- Surveyed literature on Fractional Fourier Transform and on various ways to discretize it
- **Formulated** and **proved** correctness of a **DSP algorithm** to estimate chirp parameters from noisy samples. Evaluated accuracy of the algorithm in presence of noise by simulating the setup in MATLAB
- Proved **Uncertainity Principle** for a new generalised transform extending fractional Fourier transforms

Optoelectronic Emitters : Seminar at Indo-European Winter Academy *December 2013*
Tutor: Prof. N.DasGupta, IIT Madras

- One of 5 to represent IIT Bombay at Indo-European winter academy 2013, Guwahati organised jointly by 7 IITs, FAU-Erlangen-Nuremberg, KTH Stockholm
- **Presented a 1 hour seminar talk** on Optoelectronic Emitters covering physical principles and devices
- Attended the course "High Performance Computing with applications in Electrical Engineering, Materials and processes" which involves similar seminar talks on advanced topics and intense discussion

Positions of Responsibility

Teaching Assistant

MA 105 : Calculus		*Autumn 2012,13,14*
MA 106 : Linear Algebra		*Spring 2014*
MA 108 : Differential equations		*Spring 2014*

- **Tutored** 40 strength class **once a week** clarifying doubts among other duties like scrutinizing quizzes

Joint Secretary, Electrical Engineering Students Association   *2013-14*

- Restructured the policy of SPAS to streamlined functioning in coordination with **50 professors** which led to a 50 % increase in number of projects floated and a **70 % increase** in successfully completed projects
- Planned and successfully executed 2 outings for 300 students handling a budget of **INR 1,20,000**

Publicity Manager, Aagomani 2013, Annual festival of EE Department   *2012-13*

- Increased outreach of events leading to increase in footfall by 200% by handling budget of **INR 30,000**
- Collaborated with Technophilia in publicizing in colleges all over India

Projects Undertaken

Pipelined ARM Processor   *Spring 2014*
Guide: Prof. Virendra Singh, IIT Bombay

- Architected a **6-stage pipelined** processor based on the **ARM7TDMI** Instruction Set
- Simulated the execution of instructions after designing the processor using **Verilog HDL**

LZW compression algorithm and decoding LDPC codes   *Spring 2014*
Guide: Prof. Ganesh Ramakrishnan, IIT Bombay

- Programmed **Lempel-Zev-Welch** compression and uncompression algorithm in **Java**
- Achieved about **50 % compression** ratio in the compressing large text files
- Implemented decoding of **LDPC codes** using **sum-product algorithm** in Java using specially designed data structure: Factor Graph

Wireless Communication using Amplitude Shift Keying (ASK)   *Autumn 2013*
Guide: Prof. J.Mukherjee, IIT Bombay

- Designed **Analog circuits** for ASK modulation and demodulation for medium wave band
- Transmitted and received the modulated waveforms wirelessly through **monopole antennae**
- Used a microcontroller to send bit data and another to receive the data using **UART protocol** over this channel, thereby transmitting a text message wirelessly

Photodetection using LEDS   *Spring 2013*
Guide: Prof. S.Lodha, IIT Bombay

- Used LEDs to **sense light** rather than using photodiodes using a lesser known technique
- Described hardware using **Verilog** and implemented it on **FPGA** to sense light incident on LED array
- Displayed the pattern of incident light on **graphic LCD** accurately

Key Courses

Electical Engineering : Information Theory, Error Correcting Codes, Digital Signal Processing, Stochastic Optimisation, Probability and Random Processes

Mathematics & CS : Graph Theory, Image Processing, Data structures & Algorithms, Real and Complex Analysis, Abstract Algebra

Others : Quantum Information and Computing, Data Analysis and Interpretation, Philosophy

Extra-Curricular Activities

- Attended NSERC summer school on **effective communication** at McGill university, Montreal. Practiced presenting **status reports** and **pitching in a project** in presence of industry experts.
- Awarded *bien* grade in Basic **French** course attested by Alliance Francaise de Bombay
- Attended the **Annual Training Camp** organised by 2, MAH Regiment NCC and passed the B certificate examination under the authority of Ministry of Defence, Govt. of India
- **Coordinator** for competitions group of Techfest 2012. Planned and organised the event International Robotics Challenge which had 300 participants from over 5 countries