



Praveen Agrawal
Electrical Engineering
Indian Institute of Technology Bombay
Specialization: Communication & Signal Processing

12D020030
UG Third Year(Dual Degree)
Male
DOB: 18/10/1993

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2015	8.41
Intermediate/+2	CBSE	Delhi Public School, Bokaro	2012	94.40
Matriculation	ICSE	St. Joseph's School, Dumka	2010	93.86

SCHOLASTIC ACHIEVEMENTS

- **Branch Changed** to Electrical Engineering Dual Degree from Chemical engineering Dual Degree: change of branch granted to only **68 students in a batch of over 850** students (2013)
- Recipient of M.C.M. scholarship awarded by the Ministry of Human Resource Development for the excellent performance in IIT JEE - 2012 (2012 - present)
- Awarded **Scholar Badge** by Delhi Public School, Bokaro for academic excellence in Class XI (2011)
- Secured **International Rank 27** in 4th International Mathematics Olympiad 2010 (2010)
- **District topper in ICSE Class10th** board exams with 93.86% (2010)
- Received merit certificate by Prabhat Khabar press for the outstanding performance in Class 10th ICSE exam (2010)

PROJECTS & INTERNSHIPS

LC-3B Microprocessor

(Oct '14 – Nov '14)

Guide: Prof. Dinesh K. Sharma (Department of Electrical Engineering, IIT Bombay)

- Verilog Design for a good 16-bit RISC processor using the LC-3B Instruction Set Architecture
- Designed an optimal datapath (optimal number of registers, functional units and point-to-point communication based steering logic) and finite state machine based controller.
- Integrated the controller with the datapath and implemented the entire verilog design on an FPGA

Poisson and Schrodinger Equation Solver

(Apr '14 – May '14)

Guide: Prof. Dipankar Saha (Department of Electrical Engineering, IIT Bombay)

- Studied the mathematics involved in solving the semiconductor equations in **heterojunction devices**
- Discretized the poisson equation and the schrodinger equation using **central difference technique**
- Programmed the solver using MATLAB which took the charge density function in the semiconductor substrate as an input and plotted its **conduction band edge, eigenfunctions and the eigenvalues**

Analog Alarm Clock on VGA display

(Feb '14 – Apr '14)

Guide: Prof. Madhumita Date (Department of Electrical Engineering, IIT Bombay)

- Designed an alarm clock with four hands (including alarm hand) which would be displayed on a VGA
- Solely devised the algorithm to display the clock in complete synchronization with the real time
- Programmed the clock using **Verilog HDL on a DE0 Nano FPGA Board**
- Provided user control to set the timings during the run time of the code through external switches

Voice Controlled Bot

(May '13 – Jun '13)

Under Students' Technical Activities Body (STAB), IIT Bombay

- Studied **audio signal processing** and developed algorithms for voice recognition system
- Programmed the voice recognition system (using MATLAB) to recognize 4 keywords (forward, back, left & right) which can be extended further to any number of keywords
- Built a **wireless car and a humanoid bot** that was controlled with the 4 voice commands
- Output generated by MATLAB was sent to an **arduino** board which gave the signals to run the bot

Shopping Site

(Mar '13 – Apr '13)

Guide: Prof. Sridhar Iyer (Department of Computer Science and Engineering, IIT Bombay)

- Developed an **offline** shopping site similar to **flipkart.com** using C++ programming language
- Prepared a database to store price and all details of items available for purchase for the user
- Efficient use of file handling to record User IDs, passwords, purchase history and user account details

Tic-Tac-Toe Game

(Feb '13)

Guide: Prof. Sridhar Iyer (Department of Computer Science and Engineering, IIT Bombay)

- Programmed the cross & zero game to include **CPU vs. player and 2 player modes** using Scratch
- Involves **3 difficulty levels** in CPU vs. player mode and a user friendly graphical interface
- Implemented appropriate constraints to make the **CPU invincible** in the hard level of difficulty

POSITION OF RESPONSIBILITY

Manager, Media and Creatives, Student's Technical Activities Body (STAB)

(July '14 – Present)

Technical Body of students' gymkhana, IIT Bombay

- Responsible for **designing** the **posters, flexes, t-shirts**, etc. for all the six clubs of STAB
- Working with the web manager for creating an attractive and lucid **STAB website**
- Responsible for the designing and editing of **Lightsaber (Institute's Technical Newsletter)**

Coordinator, Ozone, Techfest

(Nov '13 – Jan '14)

TechFest – Science and Technology festival of IIT Bombay: Asia's largest Science and Technology festival

- Managed the setups of gyroscope, paintball and laser tag during the 3 days of the festival
- Designed innovative **3D structures** to create the ambience of various institute arenas

Manager, Hindi Utsav

(Oct '13)

IIT Bombay's 1st ever Hindi Cultural Festival

- Planned and executed various competitions like debate, poetry writing, quiz, etc. during the festival
- Conceptualized ideas to publicize the festival in the campus which resulted in huge participation

KEY COURSES

Additional Courses: Advanced Computing for Electrical Engineers, Fundamentals of Digital Image Processing, Special Semiconductor Devices

Core EE Courses: Electromagnetic Waves, Communication Systems, Microprocessors, Probability and Random Processes, Signals & System, Digital Systems, Analog Circuits

Maths Courses: Calculus, Linear Algebra, Differential Equations, Complex Analysis

TECHNICAL SKILLS

- **Programming Proficiency:** C/C++, Blue Java, Scratch, HTML, CSS, Verilog HDL
- **Hardware Experience:** CPLD (Krypton), FPGA (DE0-Nano), 8051 Microcontroller, Arduino
- **Others:** Android app development, MATLAB, Keil, AutoCAD, NGspice

EXTRA CURRICULAR ACTIVITIES

- Developed my own **webpage** using bootstrap template: <http://home.iitb.ac.in/~praveen.agrawal> (Dec '13)
- **1st position** in **Hindi Debate** General Championship – Inter hostel competition (Sep '13)
- **1st position** in **Sophie Fine Arts** Championship – Book cover designing challenge (Aug '13)
- Stood **2nd** in **Hindi Group Discussion and Panel Discussion** organized in Hindi Utsav (Oct '12)
- Secured **1st position** in Freshie Productions – inter hostel freshmen **street play** competition (Sep '12)
- Declared as the **best speaker** in Freshiezza **Hindi Debate** competition (Aug '12)
- Taught underprivileged students at '**Asha**'- an NGO for two consecutive semesters (Jul '12- Apr '13)
- Built a radio controlled car and a line following bot for race competitions in IIT Bombay (2012)
- Great enthusiast and practitioner of **origami**: traditional Japanese art of paper folding