



Pranav Kulkarni
Electrical Engineering
Indian Institute of Technology Bombay

15D070017
UG Third Year (B.Tech.)
Male
DOB: 02/12/1997

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2018	9.66
Intermediate/+2	HCS Board	Rajiv Gandhi Academy	2015	95.85
Matriculation	CBSE Board	Jnana Prabodhini Prashala	2013	10.00

SCHOLASTIC ACHIEVEMENTS

- Currently **ranked 3rd** amongst **135** students of Electrical Engineering department 2017
- Scored a perfect Semester Performance Index **SPI 10/10** for semester 4 at IITB 2017
- Pursuing Minor degree in **Computer Science and Engineering** Present
- Awarded with **AP grade** (top 1%) in course **Data Analysis and Interpretation** 2016
- Secured All India **Rank 456** in JEE advanced among 150,000 candidates 2015
- Secured All India **Rank 68** in JEE Mains (B.Tech) exam among 1.5 million candidates 2015
- Participated in the **National Science camp VIJYOSHI** for KVPY awardees at IISC Bangalore 2014
- Received Certificate of Merit for **statewise top 1%** in **National Standard Examination in Physics - NSEP** 2014

SCHOLARSHIPS AND AWARDS

- Received URA1 – **Undergraduate Research Award** for astounding Research and Development work 2017
- Awarded with **KVPY (SA stream)** scholarship with **Rank 162** from over 50,000 students 2013-14
- Received **NTSE** scholarship for being in **top 1000** students among 5,000,000 candidates 2011
- Received scholarship with state **Rank 16** for *Maharashtra Talent Search Examination - MTSE* 2011
- Received **Gold Medal** Math Excellence - Pradnya scholarship for being in **top 11** students from Maharashtra 2010

MAJOR PROJECTS

- **Research And Development Project** *Texas Instruments Digital Signal Processing Lab, IITB*
Guide : Prof. Vikram Gadre
 - **Generalisation of Fractional Fourier transform and application in SAR** *Apr '17 - Present*
 - Researched and extended results to Generalise Fractional Fourier Transform – FrFT through Eigenvalues and Eigenfunctions based approach and studied **Generalised Time Frequency Transform - GTFT**
 - Learnt and simulated **parameter estimation** of linear and quadratic chirps using FrFT and GTFT resp
 - Studied and simulated on **MATLAB data acquisition** of SAR – Synthetic Aperture RADAR for simultaneous detection of range and velocity of moving targets using the tool learnt
 - **Touchless Fingerprint Android App** *Nov '16 - Apr '17*
 - Studied about fingerprint features, fingerprint recognition, template **extraction and matching** techniques
 - Developed an Android App that **can enroll, verify and identify** fingerprint image taken **form device camera** or the fingerprint device attached to mobile; plan to extend it to include palmprint as well
 - Built a **centralised database and matching system** on a server accessible by multiple devices
- **Semi-Autonomous Carrom Playing Bot** *ITSP - Institute technical Summer Project*
Electronics Club, IITB *May '16 - Jul '16*
 - Built a robot which analyses position of single coin placed on carrom board and plays the easiest shot
 - Devised ingenious code for **image processing in python - OpenCV** to detect position of coins and pockets
 - Controlled stepper motors by **Raspberry-pi** for positioning and DC motor for hitting the striker
- **Summer Program** *Inter-University Centre for Astronomy and Astrophysics IUCAA*
Guide : Dr. Jayant Naralikar *May '12 - Jun '12*
 - Devised method to calculate latitude of a place using the angle of rotation of **Foucault's Pendulum**
 - Demonstrated mathematical fallacies and conceptualised notions on space-time
- **Crowd Management by Simulation** *Jun '11 - Apr '12*
 - studied for **Google Science Fair - GSF project**, about the flow of granular material, crowd dynamics, crowd simulation and self organization theory for the project, with possible applications for traffic and sewage
 - Modelled crowd by pearls passing through holes, hypothesised and studied the dependence of locking of pearls and time to pass on hole parameters such as shape, size and partitions

COURSE PROJECTS

- **Hospital Management System** *Data Structures and Algorithms Course- CS 213*
Guide : Prof. Ganesh Ramkrishnan *Mar '17 - Apr '17*
 - Developed an interactive system for **Database Management** System of the patients of a General Hospital
 - Implemented **efficient data structures** like 2D hashmap, tries, queues and algorithms such as BFS
 - All operations are with $O(1)$ time complexity; stores and searches records of patients efficiently
- **Speed control of DC motor using PWM** *Digital Electronics Course - EE112*
Guide : Prof. Mahesh Patil *Mar '16 - Apr '16*
 - Devised a **digital circuit** for generating a **Pulse Width Modulation signal** with variable duty cycle
 - Controlled speed of DC motor using PWM through transistors in Darlington mode
- **Saline Level Detector for Hospital** *Electronics Devices Lab - EE236*
Guide : Prof. Anil Kottantharayil *Oct '16 - Nov '16*
 - Devised an **analog circuit with alarm indicator** using phototransistor and diodes for saline level indicator
 - Tuned circuit parameters for ensuring excitation varies significantly when saline is below threshold level

POSITIONS OF RESPONSIBILITY

- **Teaching Assistant, Calculus MA 105** *July '17 - Present*
 - Conducting **weekly tutorials** for 50 first year undergraduate students
 - Responsible for **teaching, evaluating** and helping students with basic concepts of Calculus
- **Technical Councilor, Hostel 2 IIT Bombay** *June '17 - Present*
 - **Head of the 3 member Technical Council** and member of hostel core council responsible for hostel welfare
 - Responsible for conducting inter & intra hostel technical competitions, events for boosting tech culture
- **Events Coordinator, Techfest 2016-17 IIT Bombay** *Asia's largest science and technology festival*
 - Responsible for the execution of **Techfest Exhibitions** involving tech exhibits from all over the world
 - Assisted in the PAN India **Diabetes awareness Campaign CURED** aiming a Guinness World Record
 - Single-handedly managed a **3 day workshop on Data Analysis** during the festival

TECHNICAL SKILLS

- **Programming Languages:** C++, Java, Python, HTML, R, VHDL, \LaTeX , Assembly language
- **Softwares Packages:** OpenCV, MATLAB, Android Studio, Eagle, ngSpice, Git, AutoCAD, SolidWorks, Quartus
- **Micro-controller boards:** Arduino, Rapberry-Pi, CPLD (Altera MAX3000A), Tiva-C, 8051

KEY COURSES

- **Electrical Engineering:** Communication Systems[†], EM Waves[†], Microprocessors[†], Signals and Systems, Probability and random Processes[†], Information Theory and Coding, Analog Circuits, Digital Systems, Network Theory, Data Analysis and Interpretation, Electronic Devices, Machines and Power Electronics
- **CS and Mathematics:** Digital Image Processing[†], Machine Learning(Coursera, Stanford University), Computer Networks, Data Structures and Algorithms, Computer Programming and Utilisation, Calculus, Linear Algebra, Ordinary and Partial Differential Equations, Complex Analysis *[[†] - To be completed by Nov 2017.]*

EXTRA CURRICULAR ACTIVITIES

Technical Activities

- Secured **2nd position** in Science Quiz arranged by IUCAA among around 300 school teams *Feb '12*
- Built a **Line Follower Bot** implementing PID algorithm 3 out of 4 checkpoints under Robotics Club, IITB *Jan '16*
- Successfully built and flew a **Remote Controlled Plane** from scratch under Aerodynamics Club, IITB *Nov '15*
- Studied about **energy conservation and alternative energy generation** methods (like pellets from hotel waste, oil from MWS) being a part of school special interest group *'12-'13*

Sports

- **Hostel Special mention** for securing **Gold Medal twice in Chess** General Championship *'16,'17*
- Won **Bronze medal in Kho-Kho** General Championship, attended camp of **Inter IIT Team** selection *'15,'17*

Other Skills

- Qualified *Prarambhik and Praveshika* exams of **Classical Music** by Gandharva Mahavidyalay *'08,'09*
- Qualified with distinction upto level 5 of **Sanskrit** excellence exams by Tilak Maharashtra Vidyapeeth, Pune *'12-'13*
- **Ranked 2nd in life essential skills enrichment program** involving 14 skills like speed reading, note making, marketing, elocution, recitation, reasoning skills, hand weaving, pottery conducted by JPP *'09-'10*
- Completed training for **Resuscitation – first aid** from Astitva Lifesaving Training & H.R.S. India Ltd. *'09*