Manas Vashistha **17D070064**
Electrical Engineering **UG Second Year**
Indian Institute of Technology Bombay **Male**
 DOB: 15/11/1999

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2019	8.13
Intermediate/+2	CBSE	KHMC SCHOOL	2017	94.80
Matriculation	CBSE	O.P.G. MEMO SCHOOL	2015	10.00

Pursuing **Minor** in Centre of Studies in Resources Engineering

Scholastic Achievements

- Secured **All India Rank 270** in **JEE Advanced 2017** among 200,000 candidates
- Awarded the **AP Grade** (Top 9 out of 469 students) in Chemistry Laboratory
- Secured **99.7** percentile in **JEE Main 2017** among 1.2 million candidates
- Secured **State Rank 59** in **UP State Entrance Exam 2017** among 142,000 candidates

Projects Undertaken

Junction Box Tester — *Device Fabrication* *Ongoing since Summer '18*
Guide: Prof. Narendra Shiradkar | National Centre for Photovoltaic Research and Education, IIT Bombay

- Fabricating a device for testing sealed junction boxes before attaching to **solar panels**
- Studied various datasheets to get diode's expected voltage for a given current passing through it along with the **tolerance** value and worked out **allowed voltage range** of junction box circuit
- Programmed **ADC** to measure voltage across the junction box (when the **current source** drives a constant current through the box) and compare the readings with the **allowed voltage range**
- Modifying the device to classify junction boxes based on types of defects (Latent defect, open/short circuit) present after comparing the voltage readings with diode **I-V curve datapoints**

Diode Tester GUI — *GUI Development* *Ongoing since Summer '18*
Guide: Prof. Narendra Shiradkar | National Centre for Photovoltaic Research and Education, IIT Bombay

- Employed **Tkinter** module in **Python** to develop a **GUI** which interfaces with **Arduino** script
- Implemented **pySerial** module consisting of **ADC serial access** to provide backend for **Python**
- Exploring techniques to extract data points from the **I-V curves** given in bypass diode datasheets and then set constraints on the voltage range across junction boxes
- Modifying GUI to change the constraints on the voltage range of the junction box due to temperature dependence of **I-V characteristics** of bypass diodes

Heart Rate Monitor —*Analog Circuit Design* *Autumn '18*
Guide: Prof. Siddharth Tallur | Course Project *IIT Bombay*

- Implemented reflective **Photoplethysmography** to measure the heart beat
- Utilized IR LED-phototransistor pair **TCRT5000** to detect the PPG signal
- Employed op-amp for **amplification** of signal and active filters for **noise removal**
- Analyzed the heartbeat wave-form to measure **systolic and diastolic** heartrate

Grab Circuit —*Digital Logic Design* *Spring '18*
Guide: Prof. Subhananda Chakrabarti | Course Project *IIT Bombay*

- Devised digital logic for a **quiz buzzer system** (for 4 players) ascertaining the player with the **fastest reaction time** alongside displaying the time the player took in pressing the buzzer
- Implemented and interfaced the buzzer circuit with the timer circuit using D flip-flops and latches
- Employed 555 timer as an **astable multivibrator** for contestant's reaction time measurement
- Designed timer circuit with a **reaction time resolution** of **10ms** which could be varied using the variable resistance also the whole circuit can be extended to any number of players

Maze Solver —*Robotics*   *Spring '18*
Electronics and Robotics Club   *IIT Bombay*
⋄ Implemented **optimal algorithms** and techniques to obtain the **solution path** for the maze
⋄ Analyzed and mapped the maze using **Ultra Sonic distance sensors** and stored maze path data

Line Follower —*Robotics*   *Spring '18*
Electronics and Robotics Club   *IIT Bombay*
⋄ Assembled a sensor array using **IR Tx-Rx** pair to detect white line on black background
⋄ Utilized **optimal threshold** value for sensors to calculate distance of the line from the center
⋄ Employed **Proportional Integral Derivative** control to ensure smooth motion in correct direction

TECHNICAL SKILLS

Programming Languages	Python, C/C++, Java, MATLAB
Libraries	Tensorflow, scikit-learn, Tkinter, SciPy
Softwares	Git, GitHub, GNU Octave, Eagle, SPICE, LaTeX, AutoCAD
Web Development	Django, HTML, CSS, Javascript, Bootstrap
Robotics	Arduino, Raspberry Pi, Robot Operating System

POSITIONS OF RESPONSIBILITY

Volunteer — Abhyuday   *January '18*
Social Fest, Creating awareness about Human Rights   *IIT Bombay*
⋄ Maintained and organized the database of lecturers, performers and visitors at IIT Bombay during
  the **Annual Social Fest 2018** as a part of a team consisting of 7 student volunteers
⋄ Planned, organized, and executed lectures, events, exhibitions and workshops during the **Annual
  Social Fest 2018** as a part of the Abhyuday, IIT Bombay team

Organizer — Techfest   *December '17*
Asia's Largest College Science and Technology Festival   *IIT Bombay*
⋄ Planned, organized, and executed events along with a team of 20 student volunteers
⋄ Attended to guests and dignitaries during events, lectures, and workshops

KEY COURSES UNDERTAKEN

Electrical	Introduction to Electrical Systems, Introduction to Electronics, Data Analysis and Interpretation*, Network Theory*, Electronic Devices + Lab*, Microelectronics*, Signals and Systems**, Analog Circuits + Lab**, Digital Systems + Lab**, Electrical machines and Power Electronics + Machines Lab**
Mathematics	Multivariable & Vector Calculus, Linear Algebra, Differential Equations I & II*, Complex Analysis
Other Courses	Computer Programming and Utilization, Remote Sensing and Image Processing, Economics*, Quantum Physics and Application, Basics of Electricity and Magnetism, Physical Chemistry, Organic and Inorganic Chemistry, Biology

(*to be completed by November 2018)
(**to be completed by April 2019)

EXTRACURRICULAR ACTIVITES

⋄ Successfully completed 1 year of training under **National Cadet Corps (NCC) IIT Bombay**
⋄ Attended the 10 day **Annual Training Camp** at IIT Bombay organized by **NCC IIT Bombay**
  during November-December 2017 and paricipated in various sports and cultural events
⋄ Participated in the **Annual Republic Day Parade** held at IIT Bombay on 26th Jan 2018
⋄ Active delegate in debates and **Dynamic Speaker** at many public speaking events in school
⋄ Ardent Quizzer in many intra-school science and general knowledge quiz competitions