# MANAS VASHISTHA

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## EDUCATION

**Indian Institute of Technology Bombay**, *Mumbai, India*                    October' 18
*Dual Degree* in Electrical Engineering with *M.Tech* in  Microelectronics
*Minor* in Center of Studies in Resources Engineering
Major GPA: **8.13/10**

**Central Board of Secondary Education**, *Delhi, India*
**KHMC Senior Secondary School**, *Bahjoi*                    2017
*Intermediate* — **94.8%**
**OPG Memo School**, *Chandausi*                    2015
*Matriculation* — **10/10**

## PROJECTS UNDERTAKEN

**Junction Box Tester**                    *Ongoing since Summer '18*
*Device Fabrication under Narendra Shiradkar*                    *NCPRE, IIT Bombay*

· Fabricating a device to check for defects in sealed junction boxes before attaching to solar panels
· Utilised programmable current source IC (maintains a constant current through the junction box) and programmed ADC to measures the voltage across the junction box while constant current flows
· Formulated *allowed voltage range* across junction box using diode's expected voltage & *tolerance*
· Modifying the device to classify junction boxes based on types of defects (Latent, open/short circuit) by comparing the measured voltage acroos the box with the *allowed voltage range*

**Diode Tester GUI**                    *Ongoing since Summer '18*
*GUI Development under Narendra Shiradkar*                    *NCPRE, IIT Bombay*

· Employed Tkinter module in *Python* to develop a *GUI* which interfaces with Arduino script
· Implemented pySerial module encapsulating access to the serial port & provides backend for *Python*
· Exploring techniques to extract data points from the *I-V characteristics* provided in bypass diode datasheets and then use them to set constraints on the *allowed voltage range*
· Modifying the GUI to change constraints on the voltage range across the junction boxes since the *I-V characteristics* of bypass diodes are temperature dependent

**Heart Rate Monitor**                    *Autumn '18*
*Analog Circuit Design under Siddharth Tallur*                    *Electrical Engineering, 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 & diastolic* heartrate

**Grab Circuit**                    *Spring '18*
*Digital Logic Design under Subhananda Chakrabarti*                    *Electrical Engineering, IIT Bombay*

· Devised digital logic for a quiz buzzer system (for 4 players) ascertaining the player with the *fastest reaction time* alongside displaying the *reaction time*
· Designed the circuit with a *reaction time resolution* of *10ms* which can be varied also, the whole circuit can be extended to any number of players

**Maze Solver**                    *Spring '18*
*Robotics under Electronics & Robotics Club*                    *IIT Bombay*

· Implemented *optimal algorithms* and techniques to obtain the *solution path* for the maze
· Analyzed and mapped the maze using Ultrasonic proximity sensors and stored maze path data

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[1]Use URL manasv09.github.io in case hyperlinks don't work

**Line Follower** *Spring '18*
*Robotics under Electronics & 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 controller to ensure smooth motion in correct direction

## SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 270** in JEE Advanced' 17 among 200,000 candidates
- Awarded the **AP Grade** (Top 1% out of 470 students) in Chemistry Laboratory
- Secured 99.7 percentile in JEE Main' 17 among 1.2 million candidates
- Secured State Rank 59 in UP State Entrance Exam' 17 among 142,000 candidates

## TECHNICAL SKILLS

- **Programming Languages** - Python, C/C++, Java, MATLAB
- **Libraries** - Tensorflow, scikit-learn, Tkinter, SciPy
- **Softwares** - Git, GitHub, GNU Octave, Eagle, SPICE, LaTeX, AutoCAD
- **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 & 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** - Data Analysis & Interpretation[1], Network Theory[1], Electronic Devices + Lab[1], Microelectronics[1], Signals & Systems[2], Analog Circuits + Lab[2], Digital Systems + Lab[2], Electrical machines & Power Electronics + Machines Lab[2]
- **Mathematics** - Multivariable & Vector Calculus, Linear Algebra, Differential Equations I & II[1], Complex Analysis
- **Other Courses** - Computer Programming & Utilization, Remote Sensing & Image Processing, Economic[1], Quantum Physics & Application, Basics of Electricity & Magnetism, Biology

## EXTRACURRICULAR ACTIVITIES

- 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

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[1]Courses taken in fall 2018 Last Updated: 7 October, 2018
[2]Tentative Courses for Spring 2019