



**Shlok Vaibhav Singh**  
**Electrical Engineering**  
**Indian Institute of Technology Bombay**

**18D070064**  
**UG Second Year**  
**Male**  
**DOB: 24/02/2000**

| Examination     | University | Institute  | Year | CPI / % |
|-----------------|------------|--|------|---------|
| Graduation      | IIT Bombay | IIT Bombay   | 2020 | 9.52    |
| Intermediate/+2 | CBSE       | Sri Kasera Bazar Vidya Niketan, Indore                     | 2018 | 95.60   |
| Matriculation   | CBSE       | St. Joseph's Sr. Sec. School, Pipariya<br>,Hoshangabad, MP | 2016 | 10.00   |

- Pursuing **Minor Degree** in **Department of Physics**

*July 2019- Present*

## ACADEMIC ACHIEVEMENTS

- Secured **AIR 320** in **JEE Advanced** 2018 given by over 0.16 million students
- Secured **AIR 680** in **JEE Mains** 2018 given by over 1 million students
- Secured **AIR 100** in **Kishore Vaigyanik Protsahan Yojana (KVPY)** *April 2018*  
conducted by Ministry of Science and Technology, Government of India
- Awarded conversion to **B. Tech program** from **Dual degree program** within *July 2019*  
Electrical Engineering department by the Institute due to excellence in academic  
year 2018-2019 on the basis of CPI among over 1000 students across all branches
- Received admission offer letter for 4 year BS (Research) programme at **Indian** *May 2018*  
**Institute of Science**, Bengaluru, based on the performance in **KVPY** exam
- Awarded AA grade (10/10) in **8 core courses** including Calculus (58 students out  
of 1032 awarded) and Computer Programming and Utilisation during the first-year

## TECHNICAL AND SCIENCE PROJECTS

### **DC Signal Attenuator and Amplifier**

*April 2019*

*Guide: Professor Subhananda Chakrabarty*

*Course Project*

- Implemented a circuit to amplify by twice or attenuate by a factor of half a given DC input, the mode controlled by the choice of user through a **switch** with all data being stored in **8 bits**
- Involved use of 8-bit Analog to Digital and vice-versa conversion ICs, Shift register, 555-timer
- Implemented a switching mechanism to activate amplification or attenuation depending upon the choice of user and implementing the **flow of control** with time between the three of ICs
- Collaborated within a team of **three people** and made presentation on the project

### **Analysis of network in microprocessor and transforms**

*October 2019*

*Guide: Professor Vikram Gadre*

*Ongoing Course Project*

- Inspecting the large and complicated electrical network existing inside a microprocessor and identifying the techniques required for analysis of the functioning and **modelling of network**
- Exploring the applications of various transforms like **Fourier**, **Laplace** and **Z-transform** in Electrical Engineering and reviewing the **intuitive development** of each of the transforms
- Coordination within a team of **two people** and presentation in **exhibition**

- Prepared a detailed 15-page report compiled using  $\text{\LaTeX}$  on some features of the Quantum mechanics like **Uncertainty principle**, **probability current** and the free-particle scattering
- Interpreted **WKB** approximation and Scattering in terms of Classical wave on string including **Ramsauer-Townsend effect** and its classical analogy with EM waves passing through slab
- Explored and pointed out a **similarity** between Classical Dipole-Radiation and the Quantum Mechanical phenomenon- Uncertainty Principle by designing a heuristic thought experiment
- Learnt the similarities between mathematical equations governing time-independent Schrödinger's equation and the classical wave equation which describe so many similarities between the Classical wave theory and some of the quantum mechanical phenomena mentioned above.
- Report selected to be awarded by a **Certificate of Merit** by the Club.

## TECHNICAL SKILLS

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**Advanced Proficiency** : C++, MATLAB, MS Word and Excel, AutoCAD,  $\text{\LaTeX}$   
**Intermediate Proficiency:** SolidWorks, NGSpice(Circuit design and simulation), Python

## KEY COURSES UNDERTAKEN

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**Electrical Engineering** : Introduction to Electrical Systems, Introduction to Electronics, Electronic Devices and Circuits \*, Electronic Devices Lab\*, Network Theory\*, Signals and Systems\*\*, Analog Circuits\*\*, Electrical Machines and Power Electronics\*\*, Machines lab\*\*, Analog lab\*\*, Digital Circuits lab \*\*, Digital systems\*\*

**Computer Science** : Computer Programming and Utilisation (C++ based)

**Physics** : Quantum Mechanics, Electricity and Magnetism, Classical Mechanics\*

**Mathematics** : Calculus, Linear Algebra, Ordinary and Partial\* Differential Equations, Data Analysis and Interpretation\*, Complex Analysis

**Others** : Engineering Drawing, Economics\*

\*to be completed in Fall, 2019      \*\* to be completed in Spring 2020

## EXTRA-CURRICULAR ACTIVITIES

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- Completed a two semester-course in Keyboard (Playing the instrument and learning the musical notation) under National Sports Organization (IIT Bombay)
- Active editor on Wikipedia and contributor to various Stack exchange websites with exchanges on scientific questions (under the pseudo names Kutsit and KutsitBhritya respectively)
- Participated actively in many intra-school debates and quizzes
- Hobbies : Phonetics and reading on European and Indian History