Shlok Vaibhav Singh
Electrical Engineering
Indian Institute of Technology Bombay

18D070064
UG Third Year (B.Tech.)
Male
DOB: 24/02/2000

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	9.54

ACADEMIC ACHIEVEMENTS

- Pursuing **Minor Degree** in **Department of Computer Science** *January 2020- Present*
- Secured **AIR 320** in **JEE Advanced** given by over 0.15 million students *2018*
- Secured **AIR 680** in **JEE Mains** given by over 1 million students *2018*
- Secured **AIR 100** in Kishore Vaigyanik Protasahan Yojana (**KVPY**) exam conducted by Indian Institute of Science, Bengaluru *2018*
- Awarded conversion to **B. Tech. program** from **Dual-degree program** within the Electrical Engineering department by the Institute on the basis of excellent CPI in the first-year *2019*
- Ranked 10^{th} amongst 76 students in third-year B.Tech. batch in the Electrical department

TECHNICAL AND SCIENCE PROJECTS

Analysis and Modelling of Periodic Gratings ***December 2019-June 2020***
Guide: Prof. Siddharth Tallur, Department of Electrical Engg., IIT Bombay *R&D Project*

- Validated and **simplified** an analytical model developed by a research group at UC Berkeley for computing **reflectivity** and **waveguide-mode profiles** of **1-D periodic** grating structures as **function** of incident beam angle and structure geometry using waveguide formalism
- Implemented a **working model** in **Matlab** for computing reflectivity of **multilayered** grating structures and benchmarked performance with an **RCWA**(Rigorous Coupled Wave Analysis) based toolbox
- Utilized the model to explore design space for **novel III-V heterostructure** high-contrast periodic gratings based optical modulators with **manuscript preparation** in progress

Application of transforms in Electrical Engineering ***October 2019***
Course Project in Network Theory under Prof. Vikram Gadre

- Explored the applications in electrical engineering and **heuristic development** of **Fourier** and **Laplace** transforms
- Presented the work in an **exhibition** to students and faculties from various colleges from different parts of India

Quantum Mechanics (as part of Summer of Science) ***July 2019***
Guide: Math and Physics Club *Self-Project*

- Reviewed prominent features of **quantum mechanics**, interpreted **WKB** approximation in terms of behavior of **waves** on **string** and explored analogy between **Ramsauer-Townsend** effect and radiation passing through a slab
- Demonstrated **similarity** between **time-frequency resolution** of **classical** dipole-radiation and the quantum mechanical uncertainty principle by designing a heuristic **thought experiment**

TECHNICAL SKILLS

Languages : C++, Python, LaTeX, VHDL, HTML
Softwares : Matlab, Mathematica, Quartus Altera, AutoCAD, SolidWorks, NGSpice

POSITIONS OF RESPONSIBILITY

Teaching Assistant, Department of Physics *January 2020-April 2020*
PH108 - Professor Dinesh Kabra *IIT Bombay*

- Selected on basis of a good grasp of subject and good communication skills, tutored a batch of 46 students
- **Mentored academically weak students** and catered to students' course related queries

KEY COURSES UNDERTAKEN

Electrical Engineering: Analog Circuits, Analog Lab, Semiconductor Devices, Introduction to Electronics, Digital Systems, Signals and Systems, Network Theory
Computer Science : Data Structures and Algorithms, Computer Programming and Utilization (C++ based)
Physics : Quantum Mechanics, Electricity and Magnetism, Classical Mechanics
Mathematics : Calculus, Linear Algebra, Complex Analysis, Ordinary Differential Equations, Partial Differential Equations, Data Analysis and Interpretation
Online Courses: Coursera- Machine Learning, Neural Networks and Deep learning, Convolutional Neural Networks MIT OCW 8.05 - Quantum Mechanics-II

EXTRA-CURRICULAR ACTIVITIES

- Completed introductory Mandarin course-TM01x offered by Tsinghua University on edX
- Completed a two semester-course in Keyboard (Playing the instrument and learning the musical notation) under National Sports Organization (IIT Bombay)