Bhagyashree Singh   200070013

Electrical Engineering   **B.Tech.**

Indian Institute of Technology Bombay   **Gender: Female**

DOB: 6/24/2002

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2024	
Intermediate	CBSE	Advanced Academy	2020	97.80%
Matriculation	CBSE	Advanced Academy	2018	97.20%

Pursuing a **Minor** degree in **Entrepreneurship** from **Desai Sethi School of Entrepreneurship**

SCHOLASTIC ACHIEVEMENTS

- Conferred **AP grade** (Advance Performer) in **BB101-Biology** granted to **37** out of 1000+ students *[2021]*
- Achieved **All India Rank** of **649** among **0.25 million** candidates in **JEE Advanced** Examination *[2020]*
- Secured **All India Rank** of **815** among **1.2 million** candidates in **JEE Main** Examination *[2020]*
- Recipient of the **KVPY** Fellowship with **AIR 479** in SA stream and **AIR 634** in SX stream *[2019 & 20]*
- Awarded the National Talent Search Examination (**NTSE**) scholarship, **ranked 15th** in **Stage 1** *[2018]*
- Secured **first position** in Indore city in Science Stream in class 12 with **97.8 percentage** *[2020]*

INTERNSHIPS & RESEARCH EXPERIENCE

IoT Research Intern *[May -Jul'22]*
Summer Intern | Lightstone Technologies (Project IPS)

- Implemented **sensor fusion** between trilateration and dead reckoning using various types of **Kalman filters**
- Optimized trilateration code using **LS methods** and performed extensive testing using **CMake** and **Catch2**
- Implemented **Path Loss** prediction models and **adaptive steplength** based distance estimation algorithms
- Undertook rigorous literature review on **efficient beacon placement** & optimal indoor positioning systems

Low-cost & Portable RT-PCR Device *[May'22 -Present]*
Advisor: Prof. Siddharth Tallur, Applied Integrated Micro Systems Lab, IITB | Research Project

- Researched and studied **PID controller** and communication protocols like **SPI**, **I2C**, **UART** for **STM32**
- Contributing to the **assembly**, **testing** and **debugging** of the **STM32 microcontroller** based main PCB
- Collaborating to evaluate **PID** design parameters to optimize thermocycler **performance** and **ramp rate**

KEY PROJECTS

IITB-RISC-22 Microprocessor *[Apr -May'22]*
Course Project | Prof. Virendra Singh

- In a team of 4, designed a **16-bit** multi-cycle processor, IITB-RISC-22, using point-to-point communication
- Devised the **hardware flowchart**, **control path** and **datapath** for 17 instructions in 3 instruction formats
- Synthesised **VHDL** code for the **controller Finite State Machine** and the datapath components

Temperature Monitor *[Mar -Apr'22]*
Course Project | Prof. Saravanan Vijayakumaran

- Interfaced **LM35** temperature sensor using **ADC MCP3008** and displayed it on LCD using **embedded C**
- The setup played alarm while blinking LEDs at certain frequency if the temperature went outside the range

String Recognizer *[Oct -Nov'21]*
Course Project | Prof. Maryam Baghini

- Synthesized a **Mealy type FSM** to detect the occurrence of a certain word sequentially in a letter string
- Utilized **VHDL** to implement **Behavioural modelling** and performed **RTL** and **Gate Level Simulations**
- Implemented and tested the design, using a testbench and **scan-chain** testing, on **Krypton CPLD** board

Analog Circuit Design *[Mar -Apr'22]*
Course Project | Prof. Anil Kottantharayil

- Designed and implemented **active filters** & **instrumentation amplifier** using LM741, TL084, INA128 ICs
- Synthesized netlist, devised **Ngspice** commands to perform the simulations to obtain desired parameters

8-bit Arithmetic Logic Unit   *[Sep -Oct'21]*
Course Project | Prof. Maryam Baghini
- Designed an **ALU** capable of addition, subtraction, NAND, XOR operations using **behavioral VHDL**
- Implemented **dataflow modelling**; verified the design using testbench and performed **scan chain** testing

Deep Learning and Neural Networks   *[May -Jun'21]*
Summer of Science | MnP Club, IIT Bombay
- Studied and compiled a report on various **Supervised** and **Unsupervised** machine learning algorithms like **Neural Networks**, **Support Vector Machines**, **Decision Trees**, **PCA**, and **K-Means Clustering**
- Explored **CNNs** and **RNNs** and implemented regression, classification, clustering and data retrieval algorithms along with various **neural networks** on datasets involving real estate and sentiment analysis

Radio Controlled Plane   *[Oct -Nov'21]*
Aeromodelling Club | IIT Bombay
- Utilized DC motors, **ESCs**, **servo motor** and **lithium polymer** battery to design the electronic circuit
- Designed the **airfoil** & **fuselage** and optimized the wing load to achieve maximum stability during flight

POSITIONS OF RESPONSIBILITY

Department Academic Mentor | IIT Bombay   *[Jun'22 -Present]*
Department Academic Mentorship Program | Dept. of Electrical Engineering
- Selected as a mentor from a pool of **100+** applicants on grounds of **interviews** and **extensive peer reviews**
- Leveraging the institute's resources to guide **4 sophomores** in their academic and extra-curricular pursuits
- Collaborating with a team of **40+** students towards building a support system for students in the department

Teaching Assistant | IIT Bombay   *[May'22 -Jun'22]*
BB101 - Biology
- Conducted weekly tutorials for a class of **40** students, consisting of problem-solving and concept discussion
- Catered to students' course-related queries and assisted the professor in administrative aspects of the course

Events and Publicity Coordinator | Techfest, IIT Bombay   *[Jun'21 -Apr'22]*
*Team member of Asia's largest science and technology fest | **5 million**+ online reach | **2500**+ National Colleges*
- Envisioned and executed **International Summits**; interacted with over **30+** leading industry professionals
- Handled the logistics, participation and publicity of **World Programming Championship**, a competitive coding competition hosting enthusiastic **3000+** participants across the globe, with cash prize of **INR 100k**

TECHNICAL SKILLS

Languages	Python, Assembly, VHDL, Embedded C, HTML, C++, MATLAB
Libraries	PyTorch, TensorFlow, NumPy, Pandas, Scikit Learn, Matplotlib, BeautifulSoup, Selenium
Software	MATLAB, Quartus, Keil μVision, NgSPICE, Microsoft Office, Adobe Creative Suite

KEY COURSES

Electrical Engineering	Analog Circuits, Digital Systems, Microprocessors, Signal Processing, EM Waves, Control Systems, Electronic Devices, Communication Systems*
Lab Courses	Analog Lab, Communications Lab*, Control Systems lab*, Digital Circuits Lab, Electronic Devices lab*, Microprocessors Lab, Power Engineering Lab
Computer Programming	Computer Programming and Utilization, Introduction to Machine Learning, Deep Learning Specialization**
Mathematics	Calculus, Linear Algebra, Differential Equations, Complex Analysis

*Courses to be completed by Nov'22, **MOOC

EXTRACURRICULAR ACTIVITIES

- Selected for 4 week course on **Machine Learning** under **Amazon Machine Learning Summer School**
- **Electrical Engineer** in **SPART IIT Bombay**, a student technical team dedicated to **lighter-than-air (LTA)** systems aspiring to innovate in solar-powered airship modeling technology
- Secured **3rd position** in **National Finals** of Iken Scientifica- India's largest hands-on science competition
- Represented Madhya Pradesh **twice** at **National - level** Gymnastics Championships organized by **School Games Federation of India (SGFI)** and **Gymnastic Federation of India (GFI)**
- Held the positions of **Literary Secretary** and **House Captain** in the school student council
- Worked on startup idea **'Husky Fusky Furniture'**, of developing **durable** and **sustainable** furniture made from crop's husk and straws under course **ENT603** : Introduction to Entrepreneurship, in a team of 7
- Completed **EnPro Workshop Series**, a combination of 4 sessions from professionals in the entrepreneurship ecosystem belonging to different sectors, conducted by **E-Cell, IIT Bombay**