K Ashvanth | **22B1289**
Electrical Engineering | **B.Tech.**
Indian Institute of Technology Bombay | **Gender: Male**
DOB: 30/06/2003

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2026	8.71
Intermediate	CBSE	Ramjas School, R.K Puram	2021	97.20%
Matriculation	CBSE	Ramjas School, R.K Puram	2019	96.80%

Pursuing a **Minor Degree** in **Artificial Intelligence and Data Science** from **C-MInDS, IIT Bombay**

SCHOLASTIC ACHIEVEMENTS

- Awarded an **AP** grade for outstanding performance in **ENT101**, among just **4** out of **200**+ students *('23)*
- Secured an All India Rank of **310** in **JEE Advanced** out of the **0.15 million**+ qualified candidates *('22)*
- Achieved an All India Rank of **401** out of the **1.2 million**+ aspirants who appeared in **JEE Mains** *('22)*

WORK EXPERIENCE

Research Intern *(Dec'23-Jan'24)*

Guide: Prof. Maryam S. Baghini | Mentor: Mohin Shaikh | Embedded Systems Lab | IIT Bombay

- Collaborated with a team of **6** to **design circuits** like **trans-impedance amplifiers**, **attenuators** etc.
- Researched about some Op-Amp non-idealities, understood Op-Amp selection and employed them in circuits
- Simulated & tested the circuits using **Analog Discovery AFG**, **Oscilloscope** and **Waveforms** software
- Explored the operation of a **bio-wearable device** with sensors capturing the motion and biomedical data
- Involved in vital biomedical **data collection** using this device from a diverse cohort of **50**+ **participants**

TECHNICAL PROJECTS

Solar Cell Selection *(April'24-Present)*

Student Satellite Program | IIT Bombay

- Understood the working of Solar Panels, studied their parameters and simulated as well as tested hardware
- Studied and simulated partial shading, read about blocking and bypass diodes, and space-grade solar panels
- Performed solar cell selection for the **CubeSat** project while taking into account the Mission Power budget

RISC Pipeline Processor *(April'24-May'24)*

Course Project | Guide: Prof. Virendra Singh | IIT Bombay

- Designed a **16 bit computing system** using **16** bit registers, memory to execute **14** different instructions
- Implemented a **6-stage pipeline**, complete with hazard detection, data forwarding and stalling mechanism
- Synthesized **Memory** & **ALU**, integrating them together with **VHDL** and a **Testbench** used for debugging

Microcontrollers Programming and Interfacing *(Jan'24-May'24)*

Microprocessors Laboratory | Guide: Prof. Sachin Patkar | IIT Bombay

- Implemented **Low Pass Digital FIR filter** with a sampling frequency 20kHz, verified results graphically
- Built a **2**-input, **3**-layer **ReLU** activated **neural network** with a watchdog timer serially outputting results
- Configured **UART** for **serial data transfer** with timers and interrupts, displaying instructions on an **LCD**

Digital Logic Design in VHDL *(Aug'23-Nov'23)*

Digital Circuits Laboratory | Guide: Prof. Siddharth Tallur | IIT Bombay

- Studied using **Structural**, **Behavioural**, and **Dataflow Modelling** on **Quartus** to design digital circuits
- Designed simple circuits involving gates; as well as complex digital circuits, such as sequential logic circuits
- Perform simulations on **ModelSim**, and hardware implementation on the **FPGA Xen10** hardware board

Analog Circuit Design *(Jan'24-May'24)*

Analog Circuits Laboratory | Guide: Prof. Anil K.G. | IIT Bombay

- Built a working **Electrocardiaogram** amplifier circuit consisting **filters** and **instrumentation amplifier**
- Designed and simulated a **square root amplifier** on **LTspice** and implemented the circuit on hardware
- Conducted experiments with an extensive range of circuits involving **OpAmps**, **diodes**, and **MOSFETs**

Power Systems Analysis *(Jan'24-May'24)*

Power Engineering Laboratory | Guide: Prof. Sandeep Anand | IIT Bombay

- Achieved **power factor improvement** in balanced 3-phase circuits using configurations of capacitor banks
- Performed **open circuit** and **short circuit** tests on a transformer and calculated it's **voltage regulation**
- Characterized a DC motor, and performed speed control on a 3-Phase Induction Motor using **V/f control**

WiFi Controlled Bot *(Dec'22-Jan'23)*

XLR8 | Electronics and Robotics Club | IIT Bombay

- Secured **1st** position out of nearly **80**+ competing teams, by clearing an obstacle-laden track in least time
- Built a **WiFi controlled four-wheeler**, with controller integration done by the WiFi module of **ESP32**
- Effectuated eleventh-hour wheel enhancements for the robot, a pivotal contribution to its ultimate success

Game optimization through Reinforcement Learning *(May'24-Present)*

Summer of Code | WnCC | IIT Bombay

- Simulated a **pole-balancing model** and **ϵ-greedy multi-armed bandit** problem in Python for different ϵ
- Applied **Q-Learning** to optimize games from the **OpenAI Gym** by altering different learning parameters
- Implemented a **Deep Q-Network** on a simple **Cartpole environment** from the **OpenAI's Gym Library**

Sudoku Solver Pipeline *(Dec'23-Jan'24)*

Winter in Data Science | Analytics Club | IIT Bombay

- Developed an end-to-end pipeline utilizing image processing techniques to solve Sudoku puzzles from images
- Utilized **OpenCV**'s image processing capabilities to precisely extract the Sudoku puzzles from noisy images
- Implemented a **Convolutional Neural Network** (CNN) based architecture, trained to solve the Sudoku

Web-Scrapper Tool *(Jan'23-Feb'23)*

Self Project

- Implemented a Web-Scrapper by using **Python**, and employing the **requests** and **BeautifulSoup** libraries
- Extracted useful data from the SoC website, and performed data processing on it using the **Pandas** library
- Demonstrated proficiency in web-scraping techniques, thereby reducing the efforts required for data analysis

POSITIONS OF RESPONSIBILITY

Technical Secretary *(Nov'23-Present)*

Hostel-6 | IIT Bombay

- Nominated by the Hostel-6 Council for nurturing a technical environment in a hostel with **500**+ residents
- Manage logistics for the Inter-Hostel Technical General Championships with over **13**+ participating hostels

Class Representative *(Sept'23-Present)*

Department of Electrical Engineering | IIT Bombay

- Elected by a class of **200**+ **students** following a series of groundworks and an aggressive campaign period
- Responsible for addressing the academic needs and concerns of a diverse cohort of fellow **2nd-year** students

Teaching Assistant *(Sept'23-Nov'23)*

Department of Mechanical Engineering | IIT Bombay

- Assigned the role of a Teaching Assistant *(TA)* for the **Mechanical** subdivision of the **Makerspace** course
- Assist them in employing **AutoCAD**, **LaserCAD**, and **Abaqus** etc. during the weekly laboratory sessions

TECHNICAL SKILLS

Languages	C, C++, Python, HTML, VHDL, Assembly
Libraries	NumPy, Pandas, Matplotlib, Tkinter, requests, BeautifulSoup
Software Tools	AutoCAD, LaserCAD, Arduino IDE, Abaqus, LaTeX, Quartus, ModelSim, LTspice, XCircuit, EAGLE, Waveforms

KEY COURSES UNDERTAKEN

Electrical	Power Engineering#, Signal Processing, Digital Systems#, Analog Circuits#, Control Systems, Electronic Devices, Microprocessors#, Communication Systems*#, EM Waves*, Devices Lab*, Controls Lab*
Mathematics & Computing	Calculus, Linear Algebra, Differential Equations, Computer Programming, Probability, Programming for Data Science, Introduction to Machine Learning
Others	Makerspace, Physical, Organic & Inorganic Chemistry, Biology, Classical & Quantum Physics, Innovation & Entrepreneurship, Psychology, Economics, Design Thinking

 # includes corresponding lab course ** to be completed by Dec' 24*

EXTRACURRICULARS

- Served as a **Core-Team Member** of **Events Subdivision** in Impulse, the annual Department fest *('24)*
- Awarded as the **Best Mentor** for the mentorship provided in **XLR8**, selected amongst **70**+ mentors *('23)*
- Delegated as an **Organizer** in the **61st Convocation** of the Department of Electrical Engineering *('23)*
- Participated in **Flipkart GRiD**, in a team of **3**, and cleared **Level 1.1**, consisting of **DSA** problems *('23)*
- Completed one year of rigorous training in **Squash** in the National Sports Organization, IIT Bombay *('23)*