



Sibasis Nayak
Computer Science & Engineering
Indian Institute of Technology Bombay

190050115
UG Second Year
Male
DOB: 07-06-2001

| Examination | University | Institute | Year | CPI / % |
|-----------------|------------|----------------------------------|------|---------|
| Graduation | IIT Bombay | IIT Bombay | 2021 | 9.59 |
| Intermediate/+2 | CBSE | SAI International School | 2019 | 94.20 |
| Matriculation | CBSE | D.A.V. Public School, Pokhariput | 2017 | 10.00 |

Pursuing a Minor degree in **Data Science and Artificial Intelligence**

SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 58** in JEE Advanced amongst 2,40,000 candidates (2019)
- Secured **All India Rank 11** in **KVPY** and received the prestigious fellowship from Govt. of India (2017)
- Secured **All India Rank 234** in JEE Main out of 1.2 million candidates (2019)
- Awarded **prodigious award** in school for Academic Excellence by **M. Venkaiah Naidu, Hon'ble Vice President of India** on the occasion of school's decadal celebrations. (2019)
- Ranked among National **Top 1%** in **NSEP** (National Standard Exam, **Physics**), **NSEC** (National Standard Exam, **Chemistry**) and **NSEA** (National Standard Exam, **Astronomy**) conducted by IAPT (2018)
- Awarded National Talent Search Examination **NTSE** scholarship by NCERT, Government of India (2017)

OLYMPIADS AND HACKATHONS

- Stood **first** in Prospect-100 Global Hackathon, judged live by **Steve Wozniak**, co-founder of Apple (2020)
- Received **Gold** medal for being among **top 42** students in **INChO** (Indian National Chemistry Olympiad) and participated in **Orientation-cum-Selection Camp** (OCSC) for **ICHO** at HBCSE, TIFR (2019)
- Selected among **India's top 45** students in **INPhO** (Indian National Physics Olympiad) and invited to attend **Orientation-cum-Selection Camp** (OCSC) for **IPhO** at HBCSE, TIFR (2019)
- Selected among **India's top 35** students in **INAO** (Indian National Astronomy Olympiad) and invited to attend **Orientation-cum-Selection Camp** (OCSC) for **IAO** at HBCSE, TIFR (2018)
- Among India's **top 300** students selected for Indian National Junior Science Olympiad (**INJSO**) (2015)

KEY PROJECTS

Textify - Text to \LaTeX

Institute Technical Summer Project

Summer 2020

Institute Technical Council, IIT Bombay

- Developed a service to recognize **handwritten text** and convert them into digitised \LaTeX script for use
- Implemented **Sobel filtering** to detect text regions and **A-star algorithm** to separate individual text lines
- Trained a **bidirectional LSTM/GRU** based **Recursive neural network** to output digitised text
- Implemented **Reg-Ex** to replace the mathematical text regions with appropriate **\TeX commands**
- Drastically improved the training and testing accuracy by experimenting with various heuristic techniques
- Developed an interactive **webapp** for users with the help of **Angular** frontend and **Django** backend environment

Online Competition and Development Environment

Guide: Prof. Amitabha Sanyal | Ongoing Course Project : Software and Systems Lab

Autumn 2020

IIT Bombay

- Creating a **cloud** based IDE and programming contest platform supporting multiple languages (C++, Python, Java)
- Providing features for real time contest creation and grading on submission **irrespective of OS** of contestant
- Setting up a website supporting **Secured User Authentication** system using the **Django** framework
- Exploring the use of **WebAssembly Technology** for client side offline compilation of source codes
- Including a **Development mode** supporting **GitHub sync**, **debugging** and **autofill** utilities
- Implementing **sandbox isolation** on the server side to improve the robustness of individual workspaces

Network Security and Cryptography

Summer of Science

Summer 2020

Maths and Physics Club, IIT Bombay

- Studied **network architecture layers**, **protocols** defining them and various **cryptographic algorithms**
- Learnt the **OSI model** structure and protocols like **HTTP**, **FTP**, **TCP**, **UDP**, **IP** and about **DNS**
- Explored basic ciphers like **Caesar-shift cipher**, **Vigen'ere cipher**, **mono-alphabetic cipher**, **Hill cipher**
- Explored some advanced cryptographic algorithms like **DES**, **AES**, **RSA** and **SHA**

Quantum Key Distribution

Quantum Computing with Qiskit

Summer 2020

Maths and Physics Club, IIT Bombay

- Analysed creation of **entangled pairs** and quantum **teleportation** of information using qubits
- Implemented the **Deutsch-Jozsa algorithm** for classifying a function as constant or balanced in a single step
- Applied the **Grover's Algorithm** to achieve a quadratic speed-up over classical search algorithms
- Implemented the **BB84 Cryptography Protocol** for secured communication between 2 different agents

OTHER PROJECTS

Abstract Data Type - Permutations Class

Autumn 2020

Guide: Prof. Ajit A Diwan | Course Project

IIT Bombay

- Created an **Abstract Data Type** representing permutations as both **bijective maps** and **collection of disjoint cycles** and implemented operations like **inverse, product and square roots**
- Used **Extended Euclidean Algorithm** along with **extension of Chinese Remainder Theorem** to implement logarithms for permutations in linear time by **automated congruence solving**

Music Organiser

Autumn 2020

Guide: Prof. Amitabha Sanyal | Course Project

IIT Bombay

- **Organised songs** by **genre** and **artists** creating directories for each album and playlist with **bash scripting**
- Implemented the script efficiently **without using any additional memory** and without spawning copies with the help of **symbolic links** to the original songs' location

Image Compression and Noise Reduction

Autumn 2020

Guide: Prof. Amitabha Sanyal | Course Project

IIT Bombay

- Replaced all color vectors in an Image with their **K Cluster Centroids** using **KMeans Algorithm**
- Reconstructed image from given (possibly overlapping) patches while minimising the **salt and pepper noise**

TECHNICAL SKILLS

Programming

C/C++, Java, Python, Bash, SQL, Sed, Awk

Tools and Software

Docker, MATLAB, Gdb, Cmake, AutoCad, Git, L^AT_EX, OpenCV, Qiskit, Arduino

Data Science

OpenCV, NumPy, Matplotlib, Pandas, TensorFlow, Keras, Pytorch

Development

Django, HTML, CSS, JavaScript, PHP, Bootstrap, Android Studio, Flutter

POSITIONS OF RESPONSIBILITY

Web and App Coordinator | Techfest, IIT Bombay

July 2020 - Present

- Working in a **20 member-team** to build the **Official Mobile App** for Techfest, Asia's Largest Technical Fest supposed to cater users from over **4200+ colleges** all over the country using **Flutter and Django**
- Responsible for creating **video playing services** of the app and to **fetch YouTube videos** and play them within the app with help of created video player

Organiser, Creatives | Mood Indigo, IIT Bombay

Oct 2019 - Dec 2019

- Responsible for the smooth conduction of **Mood Indigo**, Asia's largest college cultural festival with a footfall of **143000+** from across **1700+** colleges across India
- Aided in groundwork for recording and photography of multiple events catering to **220+** international artists

COURSES UNDERTAKEN

- **Computer Science:** Computer Programming and Utilisation, Abstractions and Paradigms for Programming, Data Structures and Algorithms*, Data Analysis and Interpretation*, Software Systems Lab*, Discrete Structures*, Computer Networks**, Design and Analysis of Algorithms**, Logic for Computer Science**
- **Misc:** Calculus, Linear Algebra, Electricity and Magnetism, Quantum Physics, Chemistry, Biology, Introduction to Electronic Circuits*, Optimization Models*, Economics**

* To be completed by November 2020

** To be completed by April 2021

EXTRACURRICULARS

- Completed a one year training under **National Sports Organisation** (NSO Kho-Kho) (2019-20)
- Served as a mentor in **CovEd India** - an organisation to mentor students during the Covid-19 pandemic (2020)
- Successfully completed course in **Data Analytics** and a project based **Tinkering Bootcamp** on basics of **micro-controllers** under Technical Summer School, IIT Bombay organised by Academic Council (2020)
- Won **Enigma** - online cryptic hunt competition organised by Techfest, IIT Bombay (2020)
- Made a **Bluetooth-controlled bot** for XLR8, organised by Electronics and Robotics Club, IIT Bombay (2019)
- **First Runners up** in **Crime Scene Investigation** competition organised by Biotech club, IIT Bombay (2019)
- Recognised in multiple **Model United Nations(MUNs)** and served Secretary General in a MUN (2014-17)