Adish Shah			200020012		
Computer Science & Engineering			**B.Tech.**		
Indian Institute of Technology Bombay			**Gender: Male**		
			DOB: 10/13/2002		

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2024	9.51
Intermediate	Telangana State Board	FIITJEE Junior College, Hyderabad	2020	98.20%
Matriculation	CBSE	Vikas the Concept School, Hyderabad	2018	99.40%

Pursuing **Honors** in Computer Science and Engineering and Minor in **Machine Intelligence and Data Science**

SCHOLASTIC ACHIEVEMENTS

- Achieved a **Change of Branch** to the department of **Computer Science & Engineering** among **16** *(2021)* out of **1200+** students owing to excellent academic performance in first year at IIT Bombay
- Secured **All India Rank 3** in CBSE All India Secondary School Examination among **1.5 Million+** candidates *(2018)* and received **merit** certificates in **3** subjects awarded to **top 0.1%** of the students
- Secured **99.78** percentile in JEE-Main out of over **1 million** aspirants and **99** percentile in JEE-Advanced *(2020)*
- Secured **All India Rank 287** in **KVPY** SA category and awarded the prestigious KVPY fellowship *(2018)*
- Among India's **top 300** students selected for Indian National **Astronomy** Olympiad (**INAO**) *(2020)*
- Secured **All India Rank 352** in **KVPY** SX category and awarded the prestigious KVPY fellowship *(2019)*
- Recipient of the **National Talent Search Examination (NTSE)** scholarship, **ranked 10th** in **Stage 1** *(2018)*

WORK EXPERIENCE

Machine Learning and Automation *May 2022 - July 2022*
Research and Development Internship *Ubisoft Mumbai, India*
- Trained a NLP based model for **Grammar Error Correction** using **T5 tokenizer** and **seq2seq** trainer class
- Developed OCR based techniques using **PyTesseract** for identifying truncated text and missing translation in images
- Implemented a deep learning based solution for **Visual Font Recognition** using **Keras** and achieved **90% accuracy**
- Augmented synthetically generated data to **10 times** the size by adding noise, blur and variable character spacing
- Employed a **Stacked Convolutional Auto-Encoder** for domain adaptation between training and testing data

Automated Program Synthesis *July 2022 - Present*
Guide: Prof. Akshay S and Prof. Supratik Chakraborty | Ongoing RnD Project *IIT Bombay*
- Working on programs having boolean combination of **polynomial inequalities over Reals** as specifications
- Automatically generating the program using ideas from **Skolem Function Synthesis** and automated reasoning

KEY PROJECTS

Float Moodle *Autumn 2021*
Guide: Prof. Amitabha Sanyal | Course Project *IIT Bombay*
- Created a learning environment for instructors and students by developing the **backend** using **Django framework**
- Added features such as **email** notifications, **automatic submission of grades** via a CSV file, **performance statistics** of students, option to **chat** with users and a discussion **forum** as part of the website
- Provided **Command Line Interface** functionalities for increasing ease of access and deployed the website on **Heroku**

Count-Ception : Cell Counting *Spring 2022*
Guide: Prof. Suyash Awate | Course Project *IIT Bombay*
- Predicted a **cell count map** of an image based on the receptive field of a smaller regression network using **PyTorch**
- Processed images using **fully convolutional redundant counting** by implementing **Count-Ception** a deep neural network architecture and trained the network on a bone marrow dataset achieving **Mean Absolute Error** of 2.3
- Experimented by varying hyper-parameters such as **stride lengths, kernels** and **activation functions**

Peer-to-Peer File Transfer Network *Spring 2022*
Guide: Prof. Kameshwari Chebrolu | Course Project *IIT Bombay*
- Built a P2P file transfer network using **socket programming** with knowledge of ports and IP addresses of the nodes
- Devised an **efficient protocol** for searching and downloading files in this network based on **breadth first search**
- Implemented the file transfer using **TCP connections** in C++ and verified it by matching **MD5** hash of the file

RISC 16 bit Processor *Spring 2022*
Guide: Prof. Virendra Singh | Course Project *IIT Bombay*
- Devised an efficient **23 state** Finite State Machine for an 8 register, **16-bit multi-cycle** processor
- Synthesized and assembled components such as **Control Path**, **Data Path** and **ALU** in Quartus Prime using VHDL

SAT Solver
Guide: Prof. Ashutosh Gupta | Course Project

Spring 2022

- Utilized **Z3** Solver to implement **DPLL**, an efficient backtracking-based algorithm to solve the Rush-Hour game
- Designed the solution by encoding the game into a **SAT** problem and adding boolean clauses for the constraints

OTHER PROJECTS

Bayesian Denoising and Image Shape Analysis
Guide: Prof. Suyash Awate | Course Project

Spring 2022
IIT Bombay

- Denoised **brain MRI** scans with **MRF** prior and **Huber** penalty using SGD with dynamic step sizing
- Aligned MRI scans using **similarity transforms** to visualize shape means and their **modes of variation**

Moodify, Music Recommender App
Seasons of Code

Summer 2021
Web and Coding Club, IIT Bombay

- Contributed to the development of an **enhanced music recommender** by merging a facial mood recognition system with a music predictor algorithm using various neural network architectures like **ANNs** and **CNNs**
- Integrated the model using **Spotify API** and finally deployed it as a web application using **streamlit**

Max Flow Min Cut Theorem
Guide: Prof. Rohit Gurjar | Paper Presentation

Spring 2022
IIT Bombay

- Presented the proof of the **Max Flow - Min Cut** theorem using **Linear Programming duality**
- Demonstrated extensions of the theorem for solving variants of max flow problems like **Vertex Capacity**

Mandelbrot Zoom Animation
Guide: Prof. Bhakaran | Course Project

Autumn 2021
IIT Bombay

- Created the **Mandelbrot Zoom** animation using **SFML** graphics library adding features like zoom and undo
- Incorporated queue data structure for undoing moves and implemented **Brent's Algorithm** for cycle detection

TECHNICAL SKILLS

Programming Languages	C/C++, Python, Bash, AWK, Sed, LaTeX, VHDL
Development	Git, Wireshark, HTML, CSS, Bootstrap, Django, Tesseract
Data Science	Tensorflow, Keras, OpenCV, Matplotlib, Numpy, SciPy, Pandas, SciKit, PyTorch

POSITIONS OF RESPONSIBILITY

Convener | Krittika - The Astronomy Club of IIT Bombay

June 2021 - April 2022

- Worked in a **team of 9** to promote astronomy through lectures, projects and competitions
- Ideated **Python** assignments based on libraries like **NumPy**, **SciPy** and **Matplotlib** and reviewed **100+** submissions
- Facilitated the execution of the Krittika Summer Projects with over **30** participants and **three** different topics
- Actively involved in **creative writing** for astronomy related blogs, articles and other write-ups

Teaching Assistant | CS 101 - Computer Programming and Utilization

Summer 2022

- Assisted Prof. S Akshay in conducting the course with a batch strength of **650+ students**
- Formulated **programming assignment** questions in C++ and resolved content related queries of students

Department Academic Mentor | Computer Science Department, IIT Bombay

June 2022 - Present

- Among the **30 third year candidates** selected after extensive peer reviews and interviews out of 64 applications
- Mentoring **6 sophomores** of CSE department by helping them in navigating department specific curriculum

COURSES UNDERTAKEN

Computer Science : Computer Networks, Data Structures and Algorithms, Discrete Structures, Data Analysis and Interpretation, Software Systems Lab, Abstractions and Paradigms in Programming, Digital Logic Design and Computer Architecture, Design and Analysis of Algorithms, Logic for Computer Science, Medical Image Computing, Applied Algorithms, Operating Systems*, AI and ML*, Foundations of Intelligent and Learning Agents*, Automata Theory*
Mathematics: Calculus, Linear Algebra, Differential Equations

*to be completed by November 2022

EXTRACURRICULARS

- Secured **2nd** place in **National Level Science Exhibition** organized by CBSE among 800+ projects *(2015)*
- Actively participating in **Competitive Programming** on various platforms such as codeforces
- Witnessed the 70th Republic Day Parade from **The Prime Minister's Box** as a guest of Hon'ble *(2019)* Prime Minister of India and received a certificate of appreciation from the **Ministry of HRD**
- Represented my school in **debating** qualifiers for Team India, conducted by Indian Schools Debating Society *(2017)*
- Stood **first** in an inter-school **badminton** tournament in the U-15 doubles category *(2016)*