



Shrey Singla
Computer Science & Engineering
Indian Institute of Technology Bombay

190050114
UG Second Year
Male
DOB: 11/08/2001

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	9.58
Intermediate/+2	CBSE	BCM Arya Model School	2019	93.60
Matriculation	CBSE	BCM Arya Model School	2017	10.00

Pursuing Minors in Artificial Intelligence and Data Science

SCHOLASTIC ACHIEVEMENTS

- Secured **All India Rank 36** in **IIT JEE-Advanced** out of 245,000 candidates (2019)
- Secured **All India Rank 49** in **JEE-Main** out of 1.2 million candidates (2019)
- Awarded the **Advanced Performer Grade** in Physical Chemistry awarded to **top 1%** of the class for exceptional performance in the course (2019)
- Awarded the prestigious **KVPY** Fellowship by Govt. of India with **All India Rank 161** (2019)
- Awarded National Talent Search Examination **NTSE** scholarship by NCERT, Govt. of India (2017)
- Secured an **All India Rank 46** in National Level Science Talent Search Examination (2017)
- Scored **439/450** in **BITSAT** (Birla Institute of Technology and Science Aptitude Test) (2019)
- Scored **800/800** in three **SAT** subject tests - Physics, Mathematics and Chemistry (2019)

OLYMPIADS

- Received **Gold Medal** given to **top 42** students in **INChO (Indian National Chemistry Olympiad)** conducted by **HBCSE** (Homi Bhabha Centre for Science Education) (2019)
- Successfully attended the pre-departure selection camp for **ICHO (International Chemistry Olympiad)** (2019)
- Selected for **INMO (Indian National Mathematical Olympiad)** with **second** overall position in North-West Region conducted by **Department of Atomic Energy** (2017)
- Ranked among National **Top 1%** in **NSEP** (National Standard Examination in Physics) and **NSEA** (National Standard Exam in Astronomy) conducted by IAPT (2018)
- Qualified for **INPhO (Indian National Physics Olympiad)** and **INAO (Indian National Astronomy Olympiad)** along with 300 other students across the country (2019)

KEY PROJECTS

Netra - Computer Interaction via Ocular Motion Tracking

Institute Technical Summer Project

(Summer 2020)

Institute Technical Council

- Received a **special mention award** from the **Institute Technical Council**
- Designed a headset which **controls the mouse pointer** according to the movement of pupil of eye
- Feature engineered a **Kernel Matrix** to detect and find center of pupil from an IR illuminated image of eye to simulate **Image Convolution** on an Arduino based microprocessor
- Implemented bivariate **Polynomial Regression Model** from scratch without library support on Arduino based microprocessor using matrix form of the **method of least squares**
- Developed custom **Convolutional Neural Network** for blink detection to imitate click using **tensorflow**

RedPlag - System to detect Plagiarism in Programs

Prof. Amitabha Sanyal | Ongoing Course Project

(Autumn 2020)

IIT Bombay

- Developing a strategy and creating an application to detect plagiarism among source code files
- Developing a parser to filter comments and whitespaces and tag each word to its **Semantic Identifier**
- Implementing the **BagofWords** and **Doc2Vec** models to represent the parse trees of files and compute the **Normalised Compression Distance** as a measure of pairwise similarity between source code files
- Developing a **Terminal Client** with passkey protection to provide authenticated users access to the services
- Developing a **GUI** to visualize the results obtained in the form of charts and plots

3-Dimensional Gesture Classifier

(Summer 2020)

Seasons of Code | Web and Coding Club

IIT Bombay

- Implemented the **transfer learning** technique to train the residual layers of **pre-trained Machine Learning models** such as **VGG16** and **GoogleNet** for Hand Gestures classification
- Deployed the model on web using **REST-API** and backend as **FLASK**
- Explored the architecture of **Siamese Neural Network** which computes the similarity between images by **activation of a distance metric** between the highest level features of images
- Implemented the state-of-the-art concept of **One-Shot learning** in 25-way hand-gesture classification

Image Encoder

(Summer 2020)

Self Project

IIT Bombay

- Developed a **Variational Autoencoder** using **Generative Deep Learning** Techniques to transform the input image of face to a **64-dimensional latent vector space**
- Constructed a **Generator** to decode the image back from the vector space to actual image after **transformations in the vector space** and identified useful **concept vectors** in the latent space

Other Projects

- Permutation Class** : Implemented a header file containing basic functions and custom functions like power, square root and logarithm by identifying cyclic graphs in the permutation
- Image Processing** : Implemented **KMeans++** algorithm to merge layers of images, retaining original appearance
- Analysis of Magnetic Resonance Images** : Designed MATLAB scripts to analyse merits of **Quadratic Mutual Information** versus correlation as a measure of dependence between two similar images

TECHNICAL SKILLS

Programming

C++, Python, C, Java, Bash, Arduino, Make, CMake

Web Development

HTML, PHP, CSS, JavaScript, Flask, Django, SQL, AngularJS

Software

MATLAB, GNU Octave, Git, L^AT_EX, AutoCAD, SolidWorks

Data Science

TensorFlow, SciPy, NumPy, OpenCV, Matplotlib, PyTorch, Keras

POSITIONS OF RESPONSIBILITY

Organiser, Techfest

(Autumn 2019)

Asia's largest Science and Technology festival

IIT Bombay

- Responsible for handling of various **International Artists** and overall logistics of their shows
- Part of a 10 membered team responsible for **ideation and execution** of events of *Ozone* - the gaming destination for an enthusiastic live crowd of 10k people

COURSES UNDERTAKEN

Computer Science

Data Structures and Algorithms + Lab*, Discrete Structures*, Data Analysis and Interpretation*, Software Systems Lab*, Design and Analysis of Algorithms**, Digital Logic Design + Lab**, Computer Networks + Lab**, Logic for Computer Science**, Abstractions and Paradigms in Programming, Computer Programming and Utilization

Mathematics

Calculus, Linear Algebra

Others

Introduction to Electrical and Electronics Circuits*, Quantum Physics and Application, Basics of Electricity and Magnetism, Optimization Models*, Engineering Graphics and Drawing, Physical Chemistry, Organic and Inorganic Chemistry, Biology

*to be completed by December 2020

**to be completed by April 2021

EXTRACURRICULARS

- Phonathon: **Pitched to 50 Alumni**, events conducted by Student Alumni Relations Cell, IIT Bombay (2020)
- Completed a two-semester course in **Table Tennis** offered by the **National Sports Organisation** (2019)
- Participated in the **Football Tournament** conducted by the Department of Computer Science (2020)
- Built an Arduino based **remote controlled car** while participating in **XLR8** in freshman year (2019)
- Participated in **RC-Plane**, a **remote-controlled airplane** building competition conducted by the **Aeromodelling Club** in the freshmen year (2019)
- Gave a dance performance on the stage of **Salsa Night**, the biggest cultural event for freshmen (2019)