Arpit Aggarwal   170050022
Computer Science & Engineering **UG Second Year**
Indian Institute of Technology Bombay **Male**
                                    DOB: 13/10/1999

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2019	9.32
Intermediate/+2	CBSE	Jayshree Periwal High School	2017	94.20
Matriculation	CBSE	Jayshree Periwal High School	2015	95.00

Pursuing **Minor** in Systems and Control Engineering

ACHIEVEMENTS

IIT-JEE:

◇ Secured **All India Rank 21** in **JEE Advanced 2017** out of 200,000 candidates
◇ Secured **All India Rank 267** in **JEE Main 2017** out of 1.2 million candidates

Olympiads and Scholarships:

◇ Received **Gold Medal** and **Certificate of Merit** for being placed in the **top 35** candidates at **INChO 2017**
◇ Awarded **Certificate of Merit** for being among the **national top 1%** in **NSEP** and **NSEA**
◇ Recipient of the prestigious **KVPY Fellowship** by Dept. of Science and Technology, Govt. of India

Other:

◇ **National Winner** in **ENIGMA** (coding contest) conducted by Techfest, IIT Bombay among 10,000 candidates.
◇ Secured the position of **Term Champion** at a National Level Competition of Arithmetics held by UCMAS

KEY PROJECTS

ChordIt – Chord Sequence Extractor — *Machine Learning, Audio Processing*   *Summer 2018*
Institute Technical Summer Project | Web and Coding Club   *IIT Bombay*

◇ Analyzed various configurations of Feed Forward Neural Networks and selected **Two Layer ANN**
◇ Used optimized routines of **Fourier Transform** to extract **12 dimensional Pitch Class Profile** vector
◇ Achieved **95%** training accuracy and **86%** test accuracy with Neural Networks on a dataset of 2000 chords
◇ Incorporated minibatches in **SGD Optimizer** for **Out-of-Core Learning** on online data

Air Hockey — *Artificial Intelligence*   *Spring 2018*
Course Project | Guide: Prof. Amitabha Sanyal   *IIT Bombay*

◇ Developed an **Artificial Intelligence** bot that plays Air Hockey at different difficulty levels
◇ Implemented smooth collisions between puck-striker and puck-wall to simulate real gaming experience
◇ Implemented a **vector-based decision-making** algorithm that enables the CPU to decide whether to attack or defend based on puck's velocity and current position on board
◇ Tested the bot by playing it against other bots and calibrated the difficulty settings accordingly

End-to-End Encrypted Chat Platform — *Cryptography*   *Spring 2018*
Course Project | Guide: Prof. Amitabha Sanyal   *IIT Bombay*

◇ Developed a chat platform that can be used to send messages from one user to another using a server
◇ The server receives the messages in encrypted form and the messages are encrypted using **Hill Encryption Method** involving matrices for encryption and decryption keys
◇ Implemented a chat box so that users can keep track of their chats while interacting with other users

Secure Personal Cloud — *Web Development, Cryptography*   *Ongoing*
Course Project | Guide: Prof. Soumen Chakrabarti   *IIT Bombay*

◇ Implementing a **Cloud Based File System** where multiple clients can upload and share files
◇ Applying **Server Client Modelling** and **Socket Programming** to support multiple clients simultaneously
◇ Using **Django** for building the backend of website and implementing web client using **React JS**
◇ Implementing block level file encryption and synchronization to ensure user data privacy

OTHER PROJECTS

Movie Reviewer — *Machine Learning, Semantic Analysis* *Summer 2018*
Self Project | Web and Coding Club
◇ Developed a machine learning model to rate movie based on comments of a person
◇ Implemented **Neural Network** and used **TextBlob** module in python for semantic classification
◇ Used **Subjectivity and Polarity** of comments as features and implemented algorithms to regulate these values

SAT Solver — *Backtracking Algorithms* *Spring 2018*
Course Project | Guide: Prof. Amitabha Sanyal *IIT Bombay*
◇ Implemented SAT solver that takes CNF formula and returns a satisfying formula
◇ Used recursive version of backtracking based **DPLL algorithm** for this task

Competitive Coding — *Data Structures and Algorithms* *Summer 2018*
Reading Project | WnCC Seasons of Code 2018
◇ Studied the standard algorithms used in competitive coding and applied them on various online judges
◇ Covered topics like **Dynamic Programming, BackTracking** and **Graph Algorithms**

TECHNICAL SKILLS

Programming	C/C++, Python, Lua, R, Java, Bash, Lisp, Prolog
Software & Tools	MATLAB, Pytorch, TensorFlow, Gnuplot, Git, LaTeX , AutoCAD, SolidWorks, Django
Development	HTML, CSS, PHP, JavaScript, Android Studio

POSITIONS OF RESPONSIBILITY

Teaching Assistant *July 2018 - Present*
Under: Prof. S. Umasankar | Course: Quantum Physics and Application *IIT Bombay*
◇ Appointed as Teaching Assistant for the course out of 48 applicants
◇ Tutored a batch of 50 first year students, cleared their doubts and evaluated their performance

Volunteer *April 2018 - Present*
Web and Coding Club, IIT Bombay
◇ Part of the Institute Technical Council, conducted events like Scratch Day and Crypt Hunt for freshmen
◇ Monitored the project of Face Recognition System in WnCC Seasons of Code

Education Volunteer *August 2017 - April 2018*
National Service Scheme, IIT Bombay
◇ Part of the group Prayog that helped children from various NGOs with practical aspects of Science
◇ Conducted workshops and tutorials to help children in understanding Science Experiments

Coordinator *July 2018 - Present*
Mood Indigo, IIT Bombay
◇ Conceptualizing and Organizing 7 Multicity Competitions pan India thus increasing outreach
◇ Revamped the governing rules and regulations of various competitions in Literary Arts genre

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**, Logic for Computer Science**, Computer Networks + Lab**, Abstractions and Paradigms in Programming + Lab, Computer Programming
Others	Calculus, Linear Algebra, Differential Equations, Mathematical Structures for Systems and Control*, Introduction to Electrical and Electronics Circuits*, Quantum Physics and Application, Basics of Electricity and Magnetism, Engineering Graphics and Drawing, Physical Chemistry, Biology, Signals and Feedback Systems**

*to be completed by November 2018 ***to be completed by April 2019*

EXTRACURRICULARS

◇ Won **1st prize** in IPL Auctions conducted by ECell IIT Bombay among 200 participants *(2018)*
◇ Secured **3rd position** in StrataZenith conducted by the Indian Game Theory Society *(2017)*
◇ **Runner Up** in CSE Department Football Tournament among 16 teams that participated *(2018)*
◇ Built bluetooth controlled car, and used **Arduino** to convert it to a **Line Follower** and **Maze Runner** using **Infrared and Ultrasonic Distance Measuring Sensors** *(2018)*