Himanshu Sheoran
Computer Science & Engineering
Indian Institute of Technology, Bombay

170050105
B.Tech.
Gender: Male
DOB: 09-06-1999

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	7.71
Intermediate	CBSE	Sunrise Modern School	2017	93.60%
Matriculation	CBSE	Campus School	2015	10

Scholastic Achievements

- **Gold** Medal in 7^{th} International Olympiad in Cryptography NSUCRYPTO *(2020)*
- Country rank **4** and world rank **25** amongst 25000 Capture The Flag teams on CTFtime.org *(2021)*
- Secured **2nd** position in Capture The Flag competition in 8th Inter IIT Tech Meet *(2019)*
- Secured institute rank **1** and overall rank **19** in HackIITK Hackathon out of 12500 participants *(2020)*
- Country rank **5** and world rank **367** combined across all hacking and challenge sites on **wechall.net** *(2020)*
- Secured All India Rank **59** in **JEE Advanced** among 200,000 students in India *(2017)*
- Secured All India Rank **368** in **JEE Main** among 1.2 million students across India *(2017)*
- Secured All India Rank **194** in Kishore Vaigyanik Protsahan Yojana *(2017)*
- Amongst the **National Top 1 percentile** in both **NSEP** and **NSEC** *(2016)*

Roles and Responsibilities

Manager, Cybersecurity Club IITB
Summer 2020 — Present

- **Spearheaded** a team of 10 people for planning and organising sessions, talks and **CTF** contests
- Developed and maintaining active wiki and blog site about cybersecurity with **1000s** of daily visitors worldwide
- Organized intra institute two-day **Capture The Flag** competitions with active participation of 250 people

Project Intern at BOSCH
Summer 2019

- Worked on Embedded systems, **IoT**, **LoRa** and various sensors for POC and prototype development
- Developed, theorized and programmed the required concepts and algorithms for creating a prototype product for processing on-line data and controlling the desired components on embedded system using **Arduino Mega**
- Responsible for the development of **Smart Shift** mobile application for android devices which enables communication between **embedded system** and mobile application for user via bluetooth

Developer at goDutch Pay
Winter 2018

- Responsible for end-to-end design, development and production of commercial website and its deployment
- Implemented front end design using **React** and back end using **Firebase** for **cross-platform** compatibility

Projects

Pyfractal
Self Project — Summer 2020

- Developed an easy to use, fully documented **Python Library** for generating brainfilling fractal curves
- Integrated intuitive **GUI** using **Tkinter** enabling understanding of fractals without mathematical background
- Packaged ready to use, **open-sourced**, multi-platform binaries for out-of-the-box working software

Malware Detector-Classifier
Self Project — Summer 2020

- **Developed** a malware detector cum classifier based on static analysis of program ensuring **zero risk** to host
- Processed **50GB** of malware and benign files to train high accuracy and f-score ML model for certain classification
- Engineered high importance features based on practical malware analysis for **low overhead** of computation

BotNet Detector
Self Project — Summer 2020

- Developed a network analysis tool for detection of **Peer-to-Peer** botnet infected hosts and traffic in network
- Analysed **47 Million** botnet and benign packets for anomaly based machine learning model used in detection
- Deduced network flows for transmission of botnet malware and further communications between infected hosts

Prime and Prejudice
Self Project — Summer 2020

- Implemented **adversarial** pseudo prime generation algorithm against any base **miller-rabin** primality tests
- Generated pseudo primes of density rarer than $\mathbf{2^{-80}}$ to fool primality testing of in-use cryptographic libraries
- Optimized and generalized algorithm to generate arbitrary size pseudo-prime against all practically large bases

Blockchain e-Voting *Self Project — Summer 2020*

- Developed consortium blockchain based e-voting system using **Proof of Authority** consensus mechanism
- Implemented **coercion-free** and verifiable voting mechanisms to ensure liquidity of democracy
- Developed authentication servers, voting interfaces, bootnodes and leaf nodes using **Flask**

Chip-9 Emulator *Self Project — Winter 2019*

- Developed a Proof-Of-Concept hybrid Intel **8080** and Gameboy emulator with memory mapped IO for inputs
- Developed CISC supporting **220** CPU instructions and handling events on **128x64** instruction controlled screen
- Implemented CPU flags, 7 8-bit registers, 3 16-bit **hybrid** registers, serial I/O and 64kB main memory

BASEic Steganography *Self Project — Summer 2020*

- **Invented** a steganographic tool for producing base-confusing strings of standard encoding mechanisms
- Exploited base conversion algorithms to detect patterns in encoded and decoded strings of english alphabet

Course Projects

Secure Personal Cloud | *Course: Software Systems* *Autumn 2018*

- Developed a web application and a command line linux client for a cloud based file system for multiple users
- Implemented full **client-side** encryption for web client using **SJCL** and linux client using **pyCryptodome**
- Implemented support for multiple simultaneous clients with automatic sync of files between client and server

SAT-Solver | *Course: Abstractions and Paradigms* *Spring 2018*

- Implemented **SAT** solver based on **DPLL** algorithm in functional programming paradigm in Racket
- Implemented recursive literal assignment and backtracing for finding satisfying assignment of formula in CNF

OSPF Protocol for Routers | *Course: Digital Logic Design* *Spring 2019*

- Implemented Open Shortest Path First protocol in **VHDL** for building forwarding tables on routers
- Modified the standard OSPF protocol and packets to increase the efficiency of data transfer and processing

Art Generation with GAN | *Course: Artificial Intelligence and Machine Learning* *Autumn 2019*

- Implemented Deep Convolutional Generative Adversarial Networks to generate art from art datasets
- Image dataset collected by scraping Google image art datasets and converted to 64X64 using bilinear interpolation

Shell File Server Client | *Course: Computer Networks* *Spring 2019*

- Developed a shell-based file server using **Socket programming** capable of handling multiple concurrent clients
- Implemented user authentication and multiple sockets for a user enabling simultaneous parallel downloads

Regular Expression Parser | *Course: Abstractions and Paradigms* *Spring 2018*

- Implemented basic level string matcher Linux-CLI utility **egrep** using functional programming in **Racket**

Technical Skills

Programming	Python, C, C++, bash, SageMath, Racket, javascript, java
Development Tools	Git, GitHub, Docker, Jekyll, AWS
CTF Tools	Ghidra, Wireshark, Nmap, Cutter, IDA, gdb, Z3, pwntools
Software Tools	Arduino, Android Studio, Unity, Matlab

Courses Undertaken

Electives	Network Security and Cryptography, Web Mining and Information Retrieval *, Automated Reasoning *, Introduction to Blockchains and Cryptocurrencies *
Coursera	Google IT Automation with Python **Specialization**, AWS Fundamentals Automated Reasoning: satisfiability, Cryptography-I Stanford, Introduction to Applied Cryptography **Specialization**

** to be completed by December 2020*

Extra curriculars

- Community moderator, contributor and amongst top **50** players at **cryptohack.org** *(2020)*
- Participation in **40+** international Capture The Flag events in 2020 and **25+** in 2021 *(2020)*
- Frequent blog and writeups creator for cryptograpic ciphers and challenges in weekly CTF contests *(2020)*
- Secured **First** position in Intra Department Badminton Tournament (Mens' Doubles) *(2018)*
- Secured **Third** position in XLR8, Remote Controlled bot making competition at IITB freshmen year *(2017)*
- Secured **Third** position in Potpurri Competition in Freshiezza, a college freshman competition *(2017)*
- Completed a year long course under National Sports Organization (**NSO**) in Table Tennis *(2017)*
- School **Head Boy** at Campus School CCSHAU, Hisar *(2014)*