Yash Sharma | **17D070059**
Computer Science & Engineering | **UG Third Year (B.Tech.)**
Indian Institute of Technology Bombay | **Male**
DOB: 20.09.1999

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2020	9.67
Intermediate/+2	Telangana State Board of Intermediate Education	Narayana Junior College	2017	98.10
Matriculation	Central Board of Secondary Education	Delhi Public School, Secunderabad	2015	10.00

Pursuing **Honours** in Computer Science and Engineering

Academic Achievements

- Currently ranked **seventh** in the Department, in a batch of 122 students (2019)
- Awarded the **Institute Academic Prize** for academic excellence in the year 2017 - 2018 (2018)
- Among the top **13 students** to be granted **Change of Branch/Major** to the Computer Science and Engineering Department, based on CPI at the end of first year (2018)
- Awarded **AP grade** for excellent performance in Chemistry Lab course, granted to 8 out of 469 students (2018)
- Bagged an **All India Rank of 46** in JEE (Main) among 1.4 million candidates (2017)
- Secured an **All India Rank of 345** in JEE (Advanced) out of 160,000 candidates (2017)
- Recommended for the KVPY fellowship and **ranked 244 All India** in the *Kishore Vaigyanik Protsahan Yojana* (KVPY-2016) SX Stream Exam (2016)
- Scored 410 out of 450 in **BITSAT**, conducted by Birla Institute of Technology, Pilani (2017)

Internship and Research Experience

Crowdsourcing and Consolidation of Segmentation Data *Summer - 2019*
Guide- *Prof. Thomas Deserno* | *Research Intern* Techniche Universität Braunschweig
[*Currently being written to be submitted in SPIE* 2020, *a medical imaging conference*]

- Implemented a variant of **STAPLE**, an expectation maximization algorithm, with a custom **Markov Random Field** (MRF) prior to delineate close to ground-truth segmentations of medical image scans from user data
- Deployed a complete application stack consisting of a **Django** backend, **PostgreSQL** DB, **Celery+Redis** Async task management docker containers with an **Nginx ingress**, on a kubernetes cluster coupled with gitlabs **CI/CD**
- Built a segmentation tool with **DouglasPeucker simplification** algorithm and **bezier curve interpolation**
- Organized a study on a controlled group of 50+ users, and used the results from the algorithm to rank them

Key Technical Projects

Medical Segmentation using Deep Learning *Spring - 2019*
Guide- *Prof. Suyash Awate* | *Course Project* IIT Bombay

- Implemented state-of-the-art **UNet** models and a modified **attention UNet** for the task of segmentation
- Trained, tested, and compared the models on popular datasets like the task of delining lungs in Chest X-Rays and marking melanomic cancer cells on the skin

Complete Implementation of Open Shortest Path First *Spring - 2019*
Guide- *Prof. Ashwin Gumaste* | *Course Project* IIT Bombay

- Implemented an end to end routing protocol using the **OSPF** version 2, with reference to **rfc 2328**
- Constructed multiple **Mealy-model-based Finite State Machines** in **VHDL**, a hardware description language
- Computed the network topology using **Djikstra** on the information received from various links in the network

Secure Personal Cloud *Autumn - 2018*
Guide- *Prof. Soumen Chakrabarti* | *Course Project* IIT Bombay

- Constructed a **'zero-knowledge' cloud** server and client with end-to-end encryption using **AES, Triple DES and RC4 encryption** techniques, following industrial standards, with keys stored locally
- Implemented multiple client synchronization using **sync locking** that protects user data
- Developed a **linux** desktop and a web client for local decryption and viewing compatibility on multiple platforms

Electronic Grab Circuit *Spring - 2018*
Guide- *Prof. Subhananda Chakrabarti* | *Course Project* IIT Bombay

- Designed a **quiz buzzer circuit** that detects which of the four players pressed their button first, lights up the respective player's LED, and disables all other players' buttons
- Constructed using combinational AND gates and sequential D flip-flops to respond to stimulus and timed the fastest player with a precision of 0.1 second

Other Projects

Various Image Processing tools for Medical Assisted Diagnosis *Spring - 2019*
Guide- *Prof. Suyash Awate* | *Course Assignments* IIT Bombay
Written various tools on **Python** for **shape analysis** and Image **segmentation**, **registration** and **denoising**

State-Dependent Encryption with Prefix Matching Cryptanalysis *Spring - 2019*
Guide- *Prof. Amitabha Sanyal* | *Course Project* IIT Bombay
Replicated the famous **Engima machine** from World War 2, using GUI and math libraries on **Racket**, a dialect of Scheme. Also devised a brute-force decryptor to test the strength of this system

Simplified Email Client-Server Model *Spring - 2019*
Guide- *Prof. Kameshwari Chebrolu* | *Course Assignment* IIT Bombay
Programmed a simple version of the **PoP3 email architecture** and built a single server multiple client model on **C++**

Smart Lab - An Android App *Summer - 2018*
Institute Technical Summer Project IIT Bombay
Developed an Android App using **Android Studio** and **Google Firebase** for multiple users to share update on a messaging interface, set deadlines, and for real-time identification of people present in the lab

Screening of Oral Cancer pre-lesions *Summer - 2018*
Guide- *Prof. Amit Sethi* IIT Bombay
Identified and annonated images of several hundred patients for oral cancer pre-lesions screening and learnt basics of the **pyTorch framework** for training **CNNs** and its application in the classification of oral cancer

Technical Skills

Programming	Fluent in C++/C, Python, MATLAB, Racket Familiar with Prolog, Answer Set Programming, Java, Bash
Web Development	HTML, CSS, Javascript, django
Softwares	Docker, Git, LaTeX, Android Studio, AutoCAD, SolidWorks, Xilinx ISE

Positions of Responsibility

Teaching Assistant
CS 251 - *Software Systems Lab*, 2019 | Course Instructor - *Prof. Amitabha Sanyal*

- Selected among five undergraduates to assist and co-conduct a lab course for the sophomores of the CSE department

MA 105 - *Calculus*, 2018 | Course Instructor- *Prof. Shripad Garge*

- Selected to teach a class of **50 freshmen**, and volunteered to help beyond class hours when required
- Coordinated with professors and students to conduct regular tutorials and doubt sessions, and evaluate exam papers

Courses Undertaken

Computer Science	Automatic Speech Recognition*, Operating Systems*, Artificial Intelligence and Machine Learning*, Computer Architecture*, Medical Image Computing, Digital Logic Design, Computer Networks, Design and Analysis of Algorithms, Data Analysis and Interpretation, Logic for CS, Software Systems Lab, Discrete Structures, Computer Programming and Utilization, Data Structures and Algorithms, Abstractions and Paradigms in Programming
Mathematics	Calculus, Linear Algebra, Differential Equations, Mathematical Structures for Systems and Control
Others	Psychology*, Quantum Physics, Basics of Electricity and Magnetism, Biology, Chemistry, Introduction to Electronics and Electrical Systems, Economics, Signals and Feedback Systems

**to be completed by December 2019*

Extracurriculars

- Qualified for the final round of **Microsoft AI Challenge** *Winter - 2018*
- Secured 321st rank globally in **picoCTF** conducted by **Carnegie Mellon University** *Autumn - 2018*
- Completed a semester in **French** Language Course, offered by the International Relations Office *Autumn - 2018*
- Attended and competed in an Android Workshop and hackathon, conducted by the Web and Coding Club, IIT Bombay, made a Q/A game app **InstiLife** and stood **second** in the competition *Spring - 2018*
- Hosted speaker sessions and organized shows as an organizer in **E-Summit**, a two-day business event conducted by **Entrepreneurship Cell**, IIT Bombay *Spring 2018*
- Participated in **XLR8**, which involved making a mobile-controlled robotic car with a team of four clearing an obstacle course, conducted by the Electronics and Robotics Club, IIT Bombay *Autumn - 2017*
- Successfully completed an year long course in **Indian Classical Vocals** under the **NSO programme** *2017 – 18*
- Stood **first** in a Shakespearan themed Inter-School Dramatics competition *2015*