



**Lakshya Kumar Singh**  
**Electrical Engineering**  
**Indian Institute of Technology, Bombay**  
**Specialization: Communication & Signal Processing**

**16D070064**  
**Dual Degree (B.Tech. + M.Tech.)**  
**Gender: Male**  
**DOB: 02-09-1997**

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	

## Research Experience

**Anomalous Activity Detection | Masters Thesis** July '20 - Present

*Identification of abnormal human & object behaviour in video feed using deep learning | Prof. Rajbabu Velmurugan*

- Built CNNs and dataloader for **MNIST** & **Fashion-MNIST** from scratch and achieved **99.23%** & **92.5%** accuracy
- Focusing on implementing **novel Pose-Conditional Variational Auto Encoders** & 3D convolution for a versatile model

**Advanced Encryption(AES) Robustness Testing | Research Project** May '18 - June '18

*Assessment of Advanced Encryption Standard algorithm for randomness in ciphers | Prof. V.R.Sule*

- Created a C++ program to run AES-128 encryption algorithm in **Counter (CTR)** mode
- Analyzed randomness in AES cipher-texts using DieHarder battery of tests & **achieved 98%** success rate

## Internship

**Analyst | MeDAL Lab** May '19 - June '19

*Medical Image Analysis using Deep learning | Prof. Amit Sethi*

- Implemented **data pre-processing** on CAMELYON'16 dataset for detection of metastasis in breast cancer
- Programmed **PyTorch** dataloader generating manageable-dimension images from gigapixel whole slide images

## Key Course Projects

**Deep Neural Style Transfer** Aug '19 - Nov '19

*Prof. Sunita Sarawagi | Foundations of Machine Learning*

- Implemented **deep learning** based approach to portray an image in style of another image
- Utilized feature space provided by **19 layer VGG** network with 5 pooling layers

**Color Image to Pencil Sketch Converter** Aug '19 - Nov '19

*Prof. Shabbir N. Merchant | Image Processing*

- Generated pencil sketch equivalent of an image using **unsharp masking filter** & canny edge detector technique
- Utilized the Color Dodge technique to change lightness level in image **achieving** more visually pleasing results

**Facial Recognition System** Jan '19 - April '19

*Prof. Vikram Gadre | Digital Signal Processing*

- **Developed** a facial recognition system in MATLAB capable of **learning faces** and **identifying people**
- Utilized method of **eigen-faces** to find covariance matrix & achieved accuracy of **92%** by comparative analysis

## Scholastic Achievements

- Achieved **99.23** percentile among 1.1 million candidates in **JEE Main**
- Awarded certificate of merit in **National Mathematics Olympiad** contest
- Secured **10/10 grade** for excellent performance in Digital Circuits Lab

## Relevant Courses and Skills

- Advanced Machine Learning<sup>(ongoing)</sup>, Foundations of Machine Learning, Image Processing, Digital Signal Processing
- **Languages and Packages:** C++, **Python**, **Pytorch**, Numpy, Pandas, C++ STL, MATLAB, EAGLE

## Positions of Responsibility

**Teaching Assistant** July '20 - Present

*Introduction to Electrical And Electronics Circuits*

- Managing logistics and assisting professor in ensuring smooth functioning of the course
- Responsible for assisting students in live sessions and conducting & evaluating exams for **250+ students**

## Other Interests and Extra-curricular activity

- Completed **two** 10-days certified **Annual Training Camp** under NCC at IIT Bombay
- Awarded **certificate** of successful completion for **B-Level** program conducted by NCC at IIT Bombay
- Awarded **Gold & Silver** medals in inter-house **Basketball & Kho-Kho** competitions in matriculation