Name - Mayank Kumar Singh

Homepage - https://mayank-git-hub.github.io
GitHub - https://github.com/mayank-git-hub

Scholastic Achievements

o Secured All India Rank of **108 in JEE Advance 2016 in General Category** among 198,228 candidates
o Secured All India Rank of **1484 in JEE Mains 2016 in General Category** among 1,207,058 candidates
o Recipient of prestigious **KVPY fellowship with All India Rank of 363 (/60,000)**

Professional Experience

o **SONY Japan, Research Internship** : *May - July 2019*
  - Worked with Audio Technology Research Department in SONY Japan, Osaki to improve Deep Audio Visual Source Separation
  - Used **WaveNet** like architecture, Temporal Convolution for audio speech separation and used visual features for improving separation **SISNR** and surpassed current SOTA implementations.

o **HDFC Life, Research Internship** : *May - July 2018*
  - Automated customer interaction by automating questions asked using **Reinforcement Learning**.
  - **Feature Engineering** and **Clustered Customer data** for extracting useful statistics and analysis of the algorithm

Projects

Research Projects..

o **Deep Audio Visual Source Separation** - *Guide Prof. Rajbabu Velmurugan and Naoya Takahashi, SONY Corp.*
  - Modified ConvTasNet to incorporate Lip Videos for enhanced **Audio Source Separation** on the AVSpeech dataset
  - Achieved State of the Art Results on it, beating Google and Oxford's implementation

o **Segmentation of Medical Image** - *Guide Prof. Amit Sethi*
  - Applied **NN**, **SSNMF**, **NMF**, **SVM** algorithms to do pixel-level segmentation on Hyperspectral Images
  - Implemented the initial steps for detecting cancer by segmenting epithelium, stromal and goblet cells.

o **Unsupervised Initialization of Deep Learning models**- *Guide Prof. Amit Sethi*
  - Aim was to address scarce availability of reliable data and using less data to reach state-of-the-art results.
  - Used **weakly supervised methods**, **Siamese triplet networks** on state-of-the-art ImageNet models

o **ISBI 2018: Diabetic Retinopathy, Segmentation of lesions**- *Guide Prof. Amit Sethi*
  - Aim - Segmentation and classification of the lesions in patients of Diabetic Retinopathy
  - Applied state-of-the-art algorithm **fusion-net** for segmentation and **Zoom-In Net** for classification.

o **Graph Convolution for Text Recognition** - *Guide Prof. Shubhasis Chaudhari*
  - Implemented the CRAFT text-detection training model based on weak supervision
    https://github.com/autonise/craft-remade
  - Working on incorporating graph convolution and language model to create end-to-end text detection and recognition

o **Whole Slide Image Stitching using DC motor video** - *Guide Prof. Amit Sethi*

Other Projects..

o **Kaggle Competition:** *iMaterialist Challenge (Furniture) at FGVC5*
  - An orthodox classification competition with **highly skewed class size** and high intra class and low inter class variation.
  - Trained **ResNet**-152, **NASNet** model using extensive class specific data augmentation.
  - Got a **rank of 30** under the team name 'Artificial incoherence'

o **Text Detection and Recognition on Documents**
  - Implemented Pixel-Link for Text Detection on https://github.com/mayank-git-hub/Text-Recognition
  - Achieved an F1-score of 74% which is **6% more than Google's on our custom dataset** consisting of passports, aadhar cards, driving license cards and other docs which we annotated using our annotation tool built using javascript.

Education

Institution	Specialisation	Year	GPA/Percentage
Indian Institute of Technology, Bombay	Electrical Engineering, B.Tech	2019(Ongoing)	8.88
Air Force School, VN, Pune (HSC)	Computer Science	2016	93.8%
Air Force School, VN, Pune (SSC)	None	2014	10

Courses Undertaken

Computer Vision   Probability and Random Process   Data Analysis and Interpretation
Network Theory   Data Structures & Algorithms   Linear Algebra
Computer Networks   Signals and Systems   Micro-Processors

Technical skills

- **Programming Languages:**
  Proficient in: C, C++, Python, JAVA, Javascript
  Specific libraries for Machine Learning - Tensorflow, Pytorch
  Also basic ability with: Matlab, Shell Script, Arduino, NgSpice, VHDL, AutoCad, Solidworks.

- **Deep learning models:**
  Classification - Res-Nets, Inception-Net, Alex-Net, Capsule-Net, Zoom-In-Net, NASNet
  Segmentation - U-net(Variants - ResNet-UNet, Fusion-Net)
  Feature Extraction - Siamese doublet/triplet networks, AutoEncoders, Variational AutoEncoders.
  Audio Separation - WaveNet, ConvTasNet, TasNet

- **Web & Android Development:**
  Server Side - Django, Flask, AWS
  Client Side - Android-Studio(JAVA), HTML, JS, D3JS, Three JS.

Position of Responsibility

- **Cofounder and Director**, Autonise AI
  - Founded a team of 8 with the vision to act as Technical Consultant in the field of Machine Learning.
  - Targeted the domains -
    Text Detection and Recognition, **Quant Algorithms**, **Facial Segmentation**

- **Mentoring**
  - **GyanAngels** - Mentored two mentees in 10th Grade in Machine Learning and Advanced Mathematics in a startup.
  - **Summer of Science** - Mentored a group of freshers and cultivated a basic understanding of ML concepts.
  - **Institute Technical Summer Project** - Supervised a team for building a handwritten letter recognition, working in real time.

- **Hostel Positions of Responsibility**
  - Sports Secretary, 2017
  - Technical Councillor, 2018

References

- **Professor Shubhasis Chaudhuri**, Director of Indian Institute of Technology, Bombay
  Contact info: sc@ee.iitb.ac.in

- **Professor Amit Sethi**, Electrical Engineering, Indian Institute of Technology, Bombay
  Contact info: asethi@ee.iitb.ac.in

- **Professor Rajbabu Velmurugan**, Electrical Engineering, Indian Institute of Technology, Bombay
  Contact info: rajbabu@ee.iitb.ac.in