

Name - Mayank Kumar Singh

Homepage - <https://mayank.autonise.com>
GitHub - <https://github.com/mayank-git-hub>

Scholastic Achievements

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

Professional Experience

- 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.
- 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.....

- Deep Audio Visual Source Separation** - Guide Prof. Rajbabu Velmurugan and Naoya Takahashi, SONY Corp.
 - Published the paper "Improving Voice Separation by Incorporating End-to-End Speech Recognition" in the ICASSP 2020 conference.
 - Modified ConvTasNet to incorporate ASR features for enhanced **Audio Source Separation** on the AVSpeech dataset
 - Achieved State of the Art Results on it, beating Google and Oxford's implementation, increasing the SI-SNR by 3.7dB.
- NENET: An Edge Learnable Network for Link Prediction in Scene Text** - Guide Prof. Shubhasis Chaudhari, IIT Bombay
 - Posted the paper "NENET: An Edge Learnable Network for Link Prediction in Scene Text" on arxiv.
 - Proposed a novel method of linking characters by creating a graph of characters and applying GNN.
 - Proposed a novel modification of GNN which outperforms other methods on link prediction task.
- 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.
- 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.
 - Competition Paper- <https://mayank.autonise.com/pdf/ISBI2018.pdf>
- Whole Slide Image Stitching using DC motor video** - Guide Prof. Amit Sethi

Other Projects.....

- 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'
- 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.
- Web Development**

- Designed and deployed website <https://www.primeacademypune.com>

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

o 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.

o 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

o Web & Android Development:

Server Side - Django, Flask, AWS
 Client Side - Android-Studio(JAVA), HTML, JS, D3JS, Three JS, ES6. React

Position of Responsibility

o 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

o 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.

o Hostel Positions of Responsibility

- Sports Secretary, 2017
- Technical Councillor, 2018

References

- o **Professor Shubhasis Chaudhuri**, Director of Indian Institute of Technology, Bombay
 Contact info: sc@ee.iitb.ac.in
- o **Professor Amit Sethi**, Electrical Engineering, Indian Institute of Technology, Bombay
 Contact info: asethi@ee.iitb.ac.in
- o **Professor Rajbabu Velmurugan**, Electrical Engineering, Indian Institute of Technology, Bombay
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