Sunil Meena | **170070025**
Electrical Engineering | **B.Tech.**
Indian Institute of Technology, Bombay | **Gender: Male**
DOB: 10-01-2000

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	8.02

Research Projects

Semi-Supervised Mammograms Classification *Spring 2020*
Course project | Guide: Prof. Amit Sethi | Dept. of Electrical Engineering *IIT Bombay*

- Implemented **Jigsaw Puzzle Reassembly**, a **Self-Supervised task**, for learning general purpose features from the Mammograms in the first part of the training process
- Processed **DICOM**(.dcm) images from **CBIS-DDSM** dataset to create training and testing set comprising of **Benign**, **Malignant** categories observed in **Mass** and **Calcification** cases
- Used **Self-labeling** on the images by breaking them into patches and ordering the patches from 1 to 9
- Observed an Average **Accuracy** of **60%** over the test set

Domain Adversarial Learning of Neural Nets *Spring 2020*
Guide: Prof. Biplab Banerjee | Dept. of Centre of Studies in Resources Engineering *IIT Bombay*

- Build Domain Adversarial Neural Network(**DANN**) to obtain optimized features which are domain indiscriminate but classifies the images into correct labels
- Tried different hidden layer and layer size combinations to obtain accuracy come latency optimized model
- Used image features obtained from Domains **Art, Clipart, RealWorld and Product** in pairs as Source and Target for adversarial training of the model
- Obtained best Avg. **Accuracy** of **73.6%** on **Source:Art, Target:RealWorld** pair of domains

Multi-MNIST Detection and Classification *Spring 2020*
Self-Project

- Created **Multi-label** images having randomly placed MNIST digits for the dataset
- Used **MobilenetV2Lite** with pretrained prior boxes for **Single Shot Detection(SSD300)**

Image-to-Image transformation *Autumn 2019*
Guide: Prof. Biplab Banerjee | Dept. of Centre of Studies in Resources Engineering *IIT Bombay*

- Used **VAE** having **Imagenet pre-trained** encoder with attention layer to get better reconstruction image
- Performed **domain translation** by feeding the latent variables from one VAE trained in one domain to another VAE trained in another domain
- Used **perceptual loss** in latent space to make the probability distributions of the two domains closer

Seam Carving for Content-Aware Resizing *Autumn 2019*
Course project | Guide: Prof. Ajit Rajwade | Dept. of Computer Science and Engineering *IIT Bombay*

- Implemented the paper "Seem Carving for Content-Aware Image Resizing" (Avidan et al. 2007): removed **minimum energy scams** (an 8 connected path from top to bottom or left to right) for image resizing to minimise content loss
- Experimented with various energy functions like L1 and L2 norm of derivative, RoG normalised energy, entropy, etc.

Classification of Gallery Images by Active Learning *Spring 2019*
Self project

- Classified images from social networking app into **Human, Documents, Memes** classes
- Avoided **class imbalance problem** by using appropriate proportions of the samples from the categories
- Used parameter un-freezing on **VGG-19 pre-trained** on Imagenet to get better results

Technical Skills

Programming	C++	Python	Google Colab	tensorflow	Keras
Softwares	MATLAB	Gnuplot	AutoCAD	VirtualBox	Latex

Courses Undertaken

Computer Science Machine Learning for Remote Sensing, Âdvanced Machine Learning, Fundamentals of Digital Image Processing, Supervised Research Exposition in Machine Learning, *Foundation of Intelligent and Learning Algorithms, *Advanced topics in Deep Learning, *Speech and Natural Language processing

**to be completed by December 2020*

Scholastic achievements and extracurricular activities are not verified by the Placement Cell