Jayesh Songara
Electrical Engineering
Indian Institute of Technology Bombay

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UG Final Year
Male
DOB: 08/01/2000

Examination	University	Institute	Year	CPI / %
Graduation	IIT Bombay	IIT Bombay	2021	7.18
Intermediate/+2	CBSE	Central Academy, CHB	2017	88.90
Matriculation	CBSE	Central Academy, CHB	2015	10.00

Awarded **National Talent Search Examination** Fellowship by NCERT, Govt. of India *[2015-present]*

Internship Experience

Deep Clustering using Autoencoders *Summer 2020*
Guide: Sangam Verma — Mastercard Inc

- Literature reviewed some of the existing works on **Clustering** using **Deep Neural Networks**.
- Implemented **Deep Convolutional Autoender** network for feature extraction on popular datasets like **MNIST**, **20 newsgroups**.
- Implemented **KMeans** clustering algorithm for joint training of Autoencoder to get high quality clustering friendly features.

Smoke detection in Videos *Summer 2019*
Guide: Praveen Samariya — Mahindra Logistics Ltd

- Made **deep learning** based smoking detection in videos using **Tensorflow** framework
- Studied several object detection such as **YOLO**, **Fast-RCNN**, **Faster RCNN**
- Created machine learning dataset containing 1000 annotated images of people smoking using **LabelImg** software.

Research Projects

Visual Question Answering in Remote Sensing *Autumn 2020*
Guide: Prof. Biplab Banerjee | Dept. of Resource Engineering | IIT Bombay

- Built **Visual Question Answering** model based on Cross Attention and Multimodal Information Bottleneck to answer Remote Sensing questions.
- Implemented **CNN-LSTM** architecture based on cross-attention to extract embeddings in the image and language modalities and establish a connection between the two.
- Utilised **Information Maximization** algorithm to learn low dimensional bottleneck layer, that has all the relevant information required to carry out the VQA task.
- Implemented **Reparameterization** technique to extract mutual information between image-query pair and established upper bound on the loss by using Symmetric KL divergence.

Technical Projects

Context based Image Inpainting using GANs *Spring 2019*
Guide: Prof. Amit Sethi | Dept. of Electrical Engineering | IIT Bombay

- Implemented **Context Encoders**, a convolutional neural network trained to generate missing contents of an image.
- Incorporated **Deep Convolutional Generative Adversarial Network** to learn representations that captures not only appearance but also the semantics of visual structures.
- Much sharper results were produced when experimented with both pixel-wise reconstruction loss and adversarial loss.

Autoencoder based Deep Clustering and Zero Shot Recognition *Autumn 2019*
Guide: Prof. Biplab Banerjee | Dept. of Resource Engineering | IIT Bombay

- Built Deep Learning model for joint training of autoencoder and KMeans clustering
- Used metric learning approach for zero shot recognition of unseen classes

Neural Style Transfer *Spring 2019*

Guide: Prof. Biplab Banerjee | Dept. of Resource Engineering | IIT Bombay

- Implemented the research paper "**A Neural Algorithm of Artistic Style**" using TensorFlow for **texture transfer** algorithm, that constrains a texture synthesis method by feature representations
- Utilized Deep convolutional generative adversarial networks with **Wasserstein loss** to generate images

Technical Skills

Programming	C++, C, MATLAB, Python
ML Libraries	TensorFlow, Pytorch, TensorBoard, OpenCV
Other Softwares	AutoCad, SolidWorks, Arduino, Spice, LaTeX

Key Courses Undertaken

Computer Science	Machine Learning, Image Processing, Cryptography
Mathematics	Data Analysis & Interpretation, Probability & Random Processes, Calculus
Electrical Engineering	Information Theory & Coding, Signal Processing, Communication, Control Systems, Microprocessors

Extracurriculars

- Keen interest in **Competitive Coding** and learning algorithms
- Active on online coding platforms like **Codeforces**, **Leetcode** and **Hackerrank**
- Devoted 80 hours as a volunteer to Vikas, National Service Scheme, IITB
- Visited BMC school and presented the ideas and thoughts on Global Warming and Recycling to 6^{th} and 8^{th} standard students
- Instructed two teams of four each to successfully complete a **Bluetooth Controlled Bot**
- Part of the **gold** winning hostel team in inter hostel sophomore cross country run GC