Vrushank Changawala

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Professional Summary:

- 1 year of experience in developing deep learning models using multiple frameworks and libraries.
- Excellent understanding of deep learning & machine learning algorithms such as CNNs, RNNs, LSTMs, GANs, AutoEncoders, Attention mechanism, Transformers, Regression, KNN, SVM, etc.
- Intuitive knowledge of Probability & Statistics, Algebra, and Calculus.
- Well-developed ability to read and implement research papers; ability to rapidly prototype code/APIs for benchmarking.
- Proficient with PyTorch, NumPy, and related libraries; limited experience with TensorFlow and Figma.

Education:

C.K.Pithawala College of Engineering & Technology **2018-2022**
Bachelor's of Engineering(B.E.) in Computer Engineering Surat, India
CGPA: 9.42
Relevant Coursework: Data-mining, Data Science using Python, Algebra & Calculus, Probability & Statistics, Software Engineering, Data structures and algorithms, Natural Language Processing, Information retrieval

Skills:

Programming: Python | C | HTML | CSS | JavaScript
Libraries, Frameworks, and others: PyTorch | Keras | Scikit-learn | OpenCv | Flask | Tensorboard | NumPy | Heroku
Languages: English | Hindi | Gujarati

Research Project:

Averting from Conventional CNNs for medical image classification (Under review)

- A comparative study of newly introduced and conventional CNN architectures on a medical image dataset.
- Performed qualitative and quantitative analysis of architectures such as VGG16, ResNets, DenseNet, InceptionNet, MLP-Mixer, and Involution.

Recent Projects:

Generative Adversarial Networks(GANs):

Implementation of ESRGAN, Pix2Pix, ProGAN, DCGAN.

- ***ESRGAN***: Performs **Super-Resolution** with **4x upscaling**; achieves **28.4 dB PSNR** on DIV2k dataset's validation set.
- ***Pix2Pix***: **Image-to-image translation** model that converts Anime pencil sketches to colored sketches.
- ***ProGAN***: Generates human faces progressively.

Image Enhancement:

Implementation of image deraining and low-light enhancement networks.

- ***Image Deraining model***: **removes rain** from the input image; achieves **26 dB PSNR** on Rain100H Dataset; can be used in driver-assistance systems to remove rain.
- ***Low-light Enhancement***: **"Night Mode"** model that enhances the lighting in low-light images; achieves **22.97 dB PSNR** on LoL dataset's evaluation set.

Image Segmentation:
Implementation of Vanilla UNet and U²Net.

- ***Nail-segmentation***: segments nails in the images; achieves 93% accuracy even though trained on only 35 images.
- **Salient-Object-Detection**: A **lightweight model** with a **size of 4 MB**(~1.1M params); achieves 88% accuracy on the DUTS-TE dataset.

Image Reconstruction:
Implementation of image compression/reconstruction using AutoEncoders.

- ***Variational AutoEncoders(VAEs)***; benchmarked on CelebA dataset.
- ***Vector Quantized Variational Autoencoders(VQVAEs)***; benchmarked on CIFAR10 & MNIST.

Natural Language Processing:
Implementation of NLP projects.

- ***Handwriting Generator***: Created a model using LSTMs that generates realistic English handwriting.
- ***News extractor and Sentiment-Analysis***: Given a stock name, fetches the top 5 articles from the internet and displays sentiment score. (Group-project)

Activities:

HackBash 2021
- The concept of the project is to digitalize and automate the healthcare ecosystem.
- It proposes PHR (Personal Health Record) and EHR (Electronic Health Record).
- I created ML models that make,
    1. Future predictions of the diseases based on symptoms.
    2. Prediction of the treatment based upon the past diagnoses.

Smart India Hackathon(SIH 2020)
- Our group created a Virtual Reality app that lets you roam around well-known places.
- Created some terrains of Mount-Everest mountain in Unity3D.