RAJA PHANINDRA KOLLA

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Education

M.Tech in Computational and Data Science **2022 – present**
Indian Institute of Science, Bangalore *CGPA: 8.10/10*

B.Tech in Mechanical Engineering **2017 – 2021**
Bharath University,Chennai *CGPA: 7.95/10*

Relevant Coursework

- Deep Learning for NLP*
- Adv Deep Rep learning*
- Adv Img Processing
- Pattern Recognition
- Linear Algebra
- Stocastic models

Internship

Scientific Machine Learning intern, Shell, Bangalore **June 2023-Present**

- Estimated concentration of reactants and products with time for Fischer–Tropsch process using **Physics Informed Neural Networks** with Deepxde tool.
- Solved ROBER problem with and without Quasi Steady State Assumption (QSSA) and found that results are better with QSSA.

Projects

Style Fusion **Mar 2023**

- Combined styles of 2 different images to obtain a new image that has elements of both styles by using pretrained **StyleGAN**. This is done by inverting both images to W+ space with **Perceptual loss** based image inversion and taking some vectors of W+ space from one image and rest from other and passing this to pretrained **StyleGAN**.

Image Inpainting **Aug 2023**

- Imlemented **Denoising Diffusion Probabilistic Models** for image inpainting. The model was conditioned on the masked input using a pre-trained U-Net model trained on the FFHQ dataset.

News Article Summarization with Text-To-Text Transfer Transformer **Apr 2023**

- Finetuned **Text-To-Text Transfer Transformer** (T5-small) for abstractive summarization of news articles. Resulting model had good ROGUE score and predicted summaries were perceptually sound.

Image Segmentation **Mar 2023**

- I trained **U-Net and U-Net++** on the Cityscapes dataset by clustering each color, assigning each pixel in the segmented image to a cluster with **K-Means and GMM**, and then classifying each pixel into its corresponding semantic class. I achieved per-pixel accuracies of 95 and 98 percentage with U-Net and U-Net++, respectively.

SMS Spam Classifier (Dataset: SMS Spam Collection Data Set **Feb 2023**

- Built classification models using **Logistic Regression, Decision Tree, SVM, LSTM and GRU** performed hyper parameter tuning. Compared them with **Naive-Bayes** Classifier as the base model.

Assignments

- Built **Transformer** using low level pytorch to change date to standard from different format.
- Built **Variational Auto Encoder** using low level pytorch and performed a classification task using the latent representation by the encoder.
- Node classification with **Graph Neural networks**
- Implemented **Backpropagation** in DNN with 2 hidden layers from scratch.
- Image compression using **Singular Value Decomposition** (SVD).

Technical Skills

Generative models: VAE, InfoVAE, VAE with a VampPrior, GANs
Programming Languages: Python, C++
Tools: PyTorch, TensorFlow, Deepxde, Numpy, Sci-kit Learn
Technical: Machine Learning, Optimization, Deep Learning, Natural Language Processing

Scholastic Accomplishments

- Awarded **Shell fellowship** for 2022-2024.
- Secured All India Rank **91/89567** students in GATE Mechanical Engineering paper in 2022.
- Secured All India Rank **30/15155** students in GATE Engineering Sciences paper in 2022.