KSHITIJ PARIKH

NeuroAI

kshitijgparikh@gmail.com kshitijparikh (+91)7069040410 github.com/kgp01 kgp01.github.io

Education

Indian Institute of Technology, Jodhpur **July 2019 – May 2023**
B.Tech in Computer Science and Engineering, CGPA ***8.10/10*** *Jodhpur, Rajasthan*

Bright VIP School **June 2017 – May 2019**
Higher Secondary Education, GSEB, Percentage: ***88.77 %*** *Vadodara, Gujarat*

Bright Ambalal School **May 2017**
Secondary Education, GSEB, Percentage: ***89.86 %*** *Vadodara, Gujarat*

Research Experience/Projects

Composite Sketch+ Text Queries for Retrieving Objects with Elusive Names and Complex Interactions | *Dr. Anand*

- Work got published in **AAAI 2024** Researching on novel architectures and loss functions to use **sketch and text for image retrieval** from large database systems.
- **Created a database** for the problem statement using Visual Genome and Google Quick Draw.
- Modified SOTA sketch based image retrieval models (**DeepSBIR, DSSA, Doodle2Search**), SOTA text based image retrieval models (**CLIP, ViLBERT, LXMERT, VisualBERT, mPLUG**) and, SOTA image + text based image retrieval models (**TIRG**) tested on our dataset.
- Working on **single encoder early fusion and multi encoder late fusion models** with various loss functions to produce SOTA results. Currently developing 4 novel models : *a) Single-encoder multimodal transformer (MMT) b) Object Localization MMT c) MMT with Classification and Object Detection Loss d) 2 Step model using CLIP as the backbone.* Models b, c, and d already outperform previous SOTA. Performing ablation studies to test the limits of the models.

Automatic Speaker Verification and Spoofing Counter Measures | *Dr. Richa Singh — IIT Jodhpur* **June - July 2021**

- Analysed the SOTA Machine Learning algorithms for **audio forgery detection**.
- Worked on implementation of different **TTS models** for generating audio deepfake to be used for training dataset for **detection model**. Worked with **Tacotron 2** to generate an end-to-end text-to-speech model for generating audio spoofs.
- Obtained experience on working with **NVIDIA DGX2.**

Blood Cell Classification and Malaria Detection | *Dr. Mayank Vatsa — IIT Jodhpur* **March - May 2022**

- Data processing for Blood Cell Classification and Malaria Detection images using Digital Image processing such as **enhancement and segmentation**. Conducted detailed experiments to **the effectiveness of Feature Extraction** using ResNet-50 and **transfer learning** to various pre-trained CNN architectures.

Multi class Image Classification on the CIFAR-10 | *Dr. Richa Singh — IIT Jodhpur* **March - May 2021**

- Successfully implemented an **end to end pipeline** of **various ML algorithms** such as **SVM, MLP, Random Forest** all using Sklearn, CNN using Tensor Flows with and without **dimensionality reduction using PCA** and analysis of various different aspects using Pandas and Numpy in Python.

Binary class Image Classification for a Mask data set | *Dr. Richa Singh — IIT Jodhpur* **March - May 2021**

- Used **OpenCV** and successfully implemented an end-to-end pipeline of various ML algorithms such as SVM, MLP, and Random Forest all using Sklearn, CNN using Tensor Flows with and without dimensionality reduction using PCA and analysis of various different aspects using Pandas and Numpy in Python.

Technical Skills

Programming Languages: Python, C, C++, , SQL
Libraries: Pytorch, Tensorflow, Numpy, Sklearn, OpenCV, Matplotlib, Pandas
Technologies/Frameworks: GitHub, CUDA, Docker, Kubernetes, MATLAB

Relevant Coursework

- Real Analysis and Multi-Variable Calculus
- Linear Algebra and Ordinary Differential Equation
- Probability, Statistics and Stochastic Process
- Maths for Computing
- Pattern Recognition and Machine Learning
- Natural Language Processing
- Computer Vision
- Deep Learning
- Dependable AI
- Optimization for Machine Learning
- Machine Learning for Big Data
- Speech Processing

Teaching Experience

- Teaching Assistant, of course, Computer Network with class size 180+ taught to 3rd and 4th year Bachelor students. Responsibilities involved conducting quizzes/class tests, checking papers, and conducting labs.