Hand Drawn Sketch Classification

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Overview

Hand drawn sketch recognition is a difficult problem to solve, various approaches were used to find a reasonable solution. Resnet18, Resnet50 and Inception were fine tuned on the given dataset and Inception_v3 was found to be the best performing among the discussed ones with ***validation accuracy of 57%.***

Pipeline:

The pipeline for this project was developed using pytorch, the starting point is the construction of a dataset class that loads the information from csv and returns as an iterator that produces image and class index pair, optionally it also returns the name of image file for downstream tasks.
Above information is then fed into a trainer that implements batch processing on *inception v_3.*
To evaluate the overall performance, *evaluate.py* can be used.
Following are the files and their usages:

File Name	Usage	Command
evaluation.py	Evaluates the dataset on the best available model, outputs the prediction in the form of csv.	*python3 evaluate.py pathToDataset* **Required Format:** *-> main dir* *-> images* *->1.png* *->2.png* *-> labels.csv* ……..
dataset.py	contains logic for dataset loading and returns an iterator that can be used in data loader	
model.py	loads inception_v3 from pytorch, modify the dense layers, implements helper methods such as counting	

	parameters	
train.py	Trains the model for 30 epochs, saves logs and checkpoints	*python3 train.py*

Training Technique

To train the model, we started with resnet18 initially but the accuracy was too low, as the model was relatively simple, so we moved to resnet50, where maximum accuracy achieved on validation set was 52%. Based on the intuition that the model needs more contextual information, we decided to try the inception_v3 model, and it achieved 57% accuracy in 23 epochs and after that the model started to overfit.

How to evaluate the model ?

- ☐ Download the zip and extract it.
- ☐ Modify the dataset directory with following format
    - ☐ BaseDir
        - ☐ Images *directory having png format of images*
        - ☐ labels.csv *having true image number and true label*
- ☐ Open terminal and run *python evaluate.py pathToDataset .*
- ☐ A file *evaluation.csv is created* with same format file name, prediction
- ☐ Checkpoint link: best checkpoint link