EMOTION RECOGNITION AND EMOJI GENERATION

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Problem Statement

Our aim is to detect the emotions from facial images. We use the original image and the detected emotion & create emojis.

Literature Review

Deep Learning approaches to detect emotions by detection in audio, image and video signals by NN'S, LSTM'S etc. used

Dataset Description

Dataset used : "Challenges in Representation Learning: Facial Expression Recognition Challenge". The dataset consists of 35887 images. Each image is a gray image with size 48x48. The dataset has 7 classes of emotions.

Anger Disgust Fear Happy

Sad Surprise Neutral

Existing Baseline for the Dataset

There are deep CNN based approaches which have accuracies of 56-65% using 4 conv. & 2 FC layers. Model predicts softmax output for 7 labels for an image.

Proposed Algorithm

1. SVM CLASSIFIER

Segmented the image using Otsu's Segmentation and extracted LBP features for each binary image. Trained an SVM with RBF kernel for 5000 images.

2. ALEXNET CNN

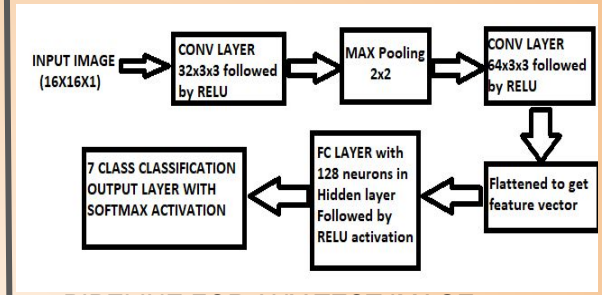
Converted gray image to 3 channel image & resized each image to suitable dimensions (227x227x3) to make image compatible to AlexNet. Training using 10,000 images on both pre-trained and non pre-trained model to extract a 1000 dimensional feature vector to feed into either an SVM or a Neural Network.

References

- Rotation
- Baseline
- Dataset

3. SELF IMPLEMENTED CNN

Block diagram is as follows:(For 19,000)



PIPELINE FOR ANY TEST IMAGE

We detect the face region by using a pre trained Haar Cascade classifier. Face extraction is done by segmenting the face area followed by converting image to gray & resizing it to 48x48 size.

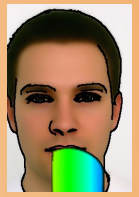
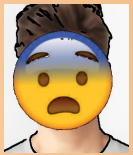
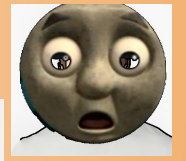
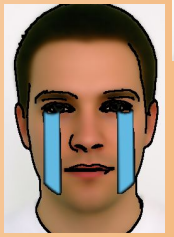


CARTOONIZATION ALGORITHM

Adding Median blurring & edge detection of the image together. Face and eyes detection using Haar Cascade followed by orientation detection of the eyes.

Results

Accuracy from SVM- 27.8%
Accuracy from Alexnet- 35%
Accuracy from Self Implemented CNN - 49.74%


Infer. & Conclusion

Self implemented CNN gives good result as we can alter image & architecture. Emotions are hard even for a computer to compute.