

Detection of Acted Happy Emotion using Facial Patches

Parth R. Singh, Nisha A. Panchal

Abstract: Facial Recognition is done to extract emotion of the face. This Paper aims to check that emotion is acted or real expression. For this paper dataset is created for the targeted purpose. The recognition of emotion is acted or not is done by extracting the special patches on faces, which are based on predefined theory where its proven that patches occurs on face for basic six expression. In this work only happy emotion is taken into consideration.

Keywords : Facial emotion, Happy emotion, HOG, PCA+LDA

I. INTRODUCTION

Many work is going on as well done in the direction of facial expression recognition but the next stage of the recognition is of sloving the challenges in facial expression recognition like illumination , point of view etc. Now one more concept has emerged under this researches that is detection of acted and real or say spontaneous expression. This is a check of truth in the shown expression by human being. The implementation of detection of true or fake emotion can be useful in many fields like in lie detector for criminals as well as witness in court are telling truth or in any circumstances they are giving fake statement to the court which may mislead or converts into injustice to some people. Implementation of this work can also help in artificial intelligence were humanoid or machine can detect it and enhance its understanding.

^[1]For the recognition of the truth of the communicated emotion is done using micro expression. This micro expression are involuntary muscle movement happening of face which shows or say leaks the real emotion. This last to 1/5 to 1/25 of a second on face. The main task is to go at the specific frames and detect this leaks. For this purpose each and every frame needs to extracted and analyzed. Every method has its own issue that is a good quality of video frames are need so that things can be analyzed. But if have a steady image of any emotions things would not be so clear. Rather in this work the special facial patches are taken into account on basis of which the truth of the expression is bifurcated. ^[2]This facial patches are occurring with respect to the emotion. The given image in figure 1 indicates the prominent patches occurring for happy emotion. This patches can used to detect truth of the emotion.

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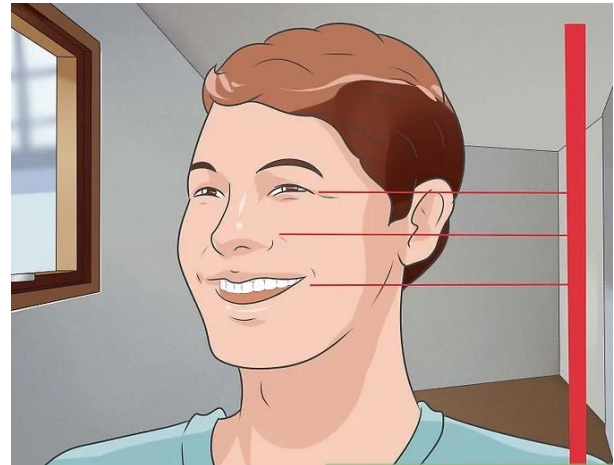


Fig. 1 Prominent patches for real happy emotion^[3]

II. DATASET

This dataset is created for only happy emotion. That is with two variation spontaneous and acted one. For the creation of this dataset random subjects were selected. Dataset consist of 50 images containing 25 real happy expression faces while 25 were acted one. Sony cyber shot was used for clicking the images. Each images is of 72 DPI vertically and horizontally. Dimensions on the images ranginn from 2000 × 2000 to 4000 × 4000.

This dataset is completely created for research purpose nor for any commercial use. This data solely target only happy emotion and in it bifurcation of the real either that spontaneous expression or acted emotion. The subject are student who posed for the research purpose. The dataset contain all high dimension colored facial images. In all images are frontal as shown in above samples. There is not a perfection of exact frontal face due to the reason of making them laugh or smile, as the purpose of capturing spontaneous expression was needed. The capturing of the images are at different time and different location so some variation in background is there. Samples of the dataset are as below.



Fig 2. Spontaneous Happy emotion faces



Fig. 3 Acted Happy emotion

III. IMPLEMENTATION

The implementation steps in this approach is done in the following way:-

- I. Labeled sets of acted and spontaneous emotion
- II. Applying some preprocessing to generate colored image to grey
- III. Region extraction using ^[13]Viola and Jones algorithm
- IV. After extracting the region applying Histogram of Gradient method to extract the feature.
- V. Using this training the ^[19]SVM and KNN

In the proposed methodology the input image is divided into two different categories that is spontaneous happy emotion and acted happy emotion. On this basic preprocessing technique is applied that is converting image to grey scale so all working is done grey scale images. And also using ^[13]Viola-Jones face detection algorithm the key points on face are captured that is co ordinates of the corner above the eye and also length & width of the eye which is actually captured location of the eye. Using this key feature the extraction of the patches that is near the eye as shown in fig 4. is done. The interested or extracted region is shown with red box in the figure 4. This is the region from where the feature is found from which we can define that the given happy emotion is real or an acted expression. Now this region is extracted and then on it histogram of gradient method is applied to extract the feature.

In this approach we have used 3 nearest neighbor and normal Support Vector machine.

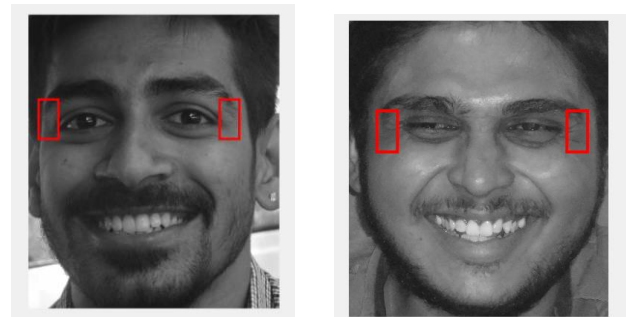


Fig. 4 Captured prominent Patches

IV. RESULTS AND ANALYSIS

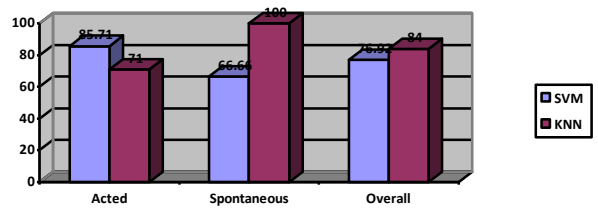


Table 1 Result on two different classifier

The result achieved is shown in table 1. The graph shows the accuracy on detecting acted happy emotion , spontaneous happy emotion and overall accuracy. The count of acted images and spontaneous images were same in testing purpose. From the created dataset the

classifier was tested on testing images in which K-nearest neighbor has showed more promising result. Support Vector machine was more accurate in detecting the acted emotion.

V. CONCLUSION & FUTURE WORK

This approach was to see the aspect from different angle. The facial patches are reliable feature but extracting it is an challenge. Moreover there are limited feature available bounded to basic six expression. And we have worked on one of the basic expression. This approach can be added or worked out in a different way so that extraction of the required feature in multipose images can be done.

There is a need to generate relevant dataset and also technique so that more work can be done on this aspect.

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