

# False Happy Emotion Detection Using Facial Patches

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**Abstract— Recognition of facial expression is done to capture emotion of the human face. The aim of this Paper is to check that emotion is fake or real expression. For this purpose dataset has been created for the targeted aim. Extraction of the special patches on faces will determine that the recognized emotion is acted or not, based on predefined theory, proved that patches forms on face to bring basic six expression. In this research paper only happy emotion has taken into consideration.**

**Keywords— Happy emotion, Facial emotion, PCA+LDA, HOG**

## I. INTRODUCTION

Many works are running on recognition of facial expression but the second stage of this recognition is to solve the challenges with facial expression recognition is likely the face is looking like illumination, the view point etc. One more concept has come out under this researches and that is the detection of fake face expression and real or say lively expression. This is a checking of actual truth shown in the expression by human being. Implementation of this concept that's mean detection of true or acted emotion could be useful in many sectors like in lie detector which is used for criminals as well as some kind of witness in court are telling truth or they are giving fake statement which may lead injustice to some people. Implementation of this research could also be helpful in artificial intelligence where machine can detect or capture it and enhance its impact and understanding.

<sup>[1]</sup>Most of the true recognition of the communicating emotion is done by using different micro expression. All these micro expressions are involuntary muscle movement, it is happening of face which shows the real emotion. It lasts for .2 to .04 second on face. The primary task is to go to the specific frames and detect these leaks. For this objective, each and every frame needs to be extracted and deeply analyzed. But if there is a not steady image of any emotions then

things will not be that clear. Rather there is a good concept here that is to collect the special facial patches into account based on the truth of the expression is divided in to two parts. <sup>[2]</sup>These facial patches are happening with respect to the emotion. The shown image in figure 1 indicates the prominent patches used to occur for happy emotion. This patches can be used to detect actual or truth of the emotion.

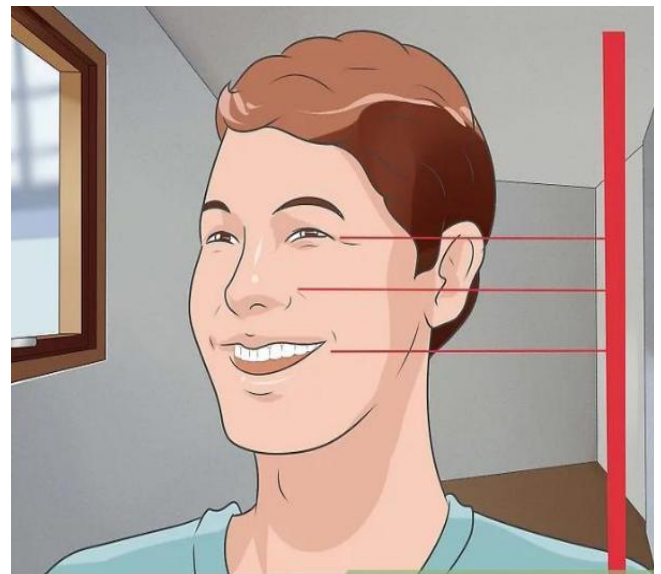


Fig. 1 Prominent patches for actual happy emotion <sup>[3]</sup>

## II. DATASET

This dataset is created for happy emotion only. That is with two variation spontaneous emotion and acted emotion of happiness. To create this dataset random subjects were selected. Dataset is containing 50 images in which 25 real happy expression faces and 25 were acted happy emotion faces. Sony cyber shot cell phone was used to click the images. Each image is about 72 DPI vertically and horizontally. The Dimensions on the images ranging from 2000 x 2000 to 4000 x 4000.

This dataset is carefully created only for research purpose not for any commercial use. This data is targeting only happy emotion. The subjects are normal students who posed to take photos for the research purpose. The dataset consists of all high dimension colored facial images. In all images there are all frontal pictures as shown in above samples. There is no perfection of exact frontal face because of making them laugh or smile, as the target of capturing spontaneous expression was needed. The capturing of the images is happened at different time in different location so some variations are there in background. Samples of the dataset are given below:

### Detection of Acted Happy Emotion using Facial Patches



Fig 2. Spontaneous or Real Happy emotion faces



Fig. 3 Acted or Fake Happy emotion faces

### III. IMPLEMENTATION

Before The implementation steps are done by the way given below:-

- I. Labeled sets of spontaneous and acted emotion
- II. Applying some preprocessing algorithm to generate colored image to grey image
- III. Extraction of Region is done by using <sup>[13]</sup> Viola and Jones algorithm
- IV. After the region extraction, applying the Gradient method Histogram to extract the feature.
- V. Use this training to the <sup>[19]</sup> SVM and KNN

In the offered methodology, the input image is divided into two parts in different categories that is spontaneous and real happy emotion and acted or fake happy emotion. On this initial processing technique, that is converting image to the grey scale and all working process has done with grey scale images. Here <sup>[13]</sup> Viola-Jones face detection algorithm is used and the key points on face are captured sharply so that the coordinates of the corner above position of the eye and also length & width of the eye which is actually directed to the location of the eye. By using this key feature the extraction of all patches that is situated at near the eye as shown in fig 4. is done. The clipped or extracted region of grey scale image is shown with red box in the figure 4. This is the region where the feature is found from which we can determine that the provided happy emotion is real and

spontaneous or an acted fake expression. Now the targeted region has extracted and then on its histogram of gradient method has applied and extracts the feature. In this approach we used three nearest neighbor and normal Supportive Vector machine.

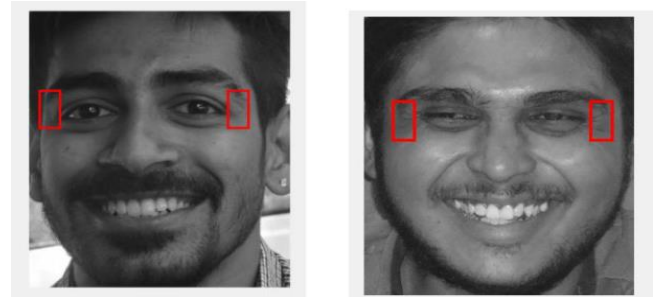


Fig. 4 Captured prominent Patches

### IV. RESULTS AND ANALYSIS

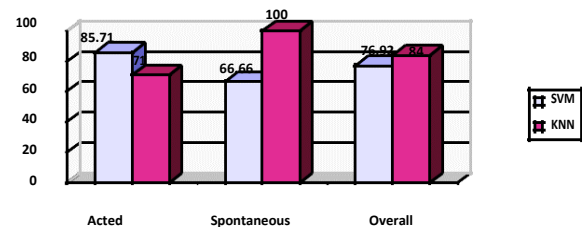


Table 1 Result on two different classifier

The achieved result is shown in table 1. The graph shows the accuracy after detecting acted happy emotion, spontaneous happy emotion and overall accuracy on emotion.

The total count of fake images real images was same in testing purpose. From this data set classifier was tested on the testing purpose images in which K-nearest neighbor has proved more promising result. Support Vector machine was more efficient in detecting the acted emotion.

### V. CONCLUSION & FUTURE WORK

This approach was made to observe the aspect from different angle. The facial patches are dependable feature but its extraction is a challenge. There are limited features remain for basic six expression. And we have worked with one of the basic expression. This approach can be extended or worked out in a different way so that the extraction of the patches of required feature in multipose images can be done.

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

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