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A REVIEW ONFACE EXPRESSION DETECTION

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***Abstract*:** Face recognition is an important research field of pattern recognition. Up to now, it caused researchers great concern from these fields, such as pattern recognition; face expression recognition and computer vision. In general, we can make sure that the performance of face expression recognition system is determined by how to extract feature vector exactly and to classify them into a class or cluster correctly. Therefore, it is necessary for us to pay close attention to feature extractor and classifier. In this research work, we propose a methodological improvement to raise face expression recognition rate by using SVM (Support Vector Machine) algorithm for representation of face using LBP (Local Binary Patterns). LBP features are originally proposed for text analysis but due to its important property, tolerance of illumination changes make it useful for face expression recognition with SVM classifier.

Keywords: Face recognition, LBP, SVM, PCA etc

I. INTRODUCTION

Mostly all applications which provide service areoperated by many users, so there is requirement of a recognition method that is reliable in nature This type of applications is face by us in our daily life in which anyoneverification method is used. In that applications ATM, phone, laptops etc. are comes. Domain name for all methods like verification, detection and recognition is biometric system. There is absence of robust verification method in these applications; due to which there is chances of wiles by an imposter in a system. Annually millions of dollar is fraud by credit card,this fraud happen due to lack of effective customer verification techniques. A sensor module is used as base of a simple biometric system, a module for a feature extraction and a module that used for matching process.

Four components are used to develop a general biometric system [1]:

- **Sensor module:**We acquire the biometric data for individual user. A fingerprint sensor is required to capture the impression of finger. This impression is store in database for further process of verification method.
- **Feature extraction:**This module helps in extracting feature values for that impression which we have stored in last process. Like an example of fingerprint image we have to find out the position and orientation of minutiae points. So to extract feature values in fingerprint image we need feature extraction module.
- **Matching module:** This is an important module in which feature values are compared with stored feature value of impression in last process. This caparison performed on basis of matching score. For example, in this module, we have to compute some points that are known as minutiae between query request and template.
- **Decision-making module:**After matching, machine give response for ID of user is true or not. The decision is taken by biometric system that either that ID matched or not. If it match then accepted otherwise it is rejected.

A facial recognition system is a computer application for automatically identifying or verifying a person from a digital image or a video frame from a video source. One of the ways to do this is by comparing selected facial features from the image and a facial database. It is typically used in security

systems and can be compared to other biometrics such as fingerprint or eye iris recognition systems. Some facial recognition algorithms identify facial features by extracting landmarks, or features, from an image of the subject's face. For example, an algorithm may analyse the relative position, size, and/or shape of the eyes, nose, cheekbones, and jaw.
A newly emerging trend, claimed to achieve improved accuracies, is three-dimensional face recognition. This technique uses 3D sensors to capture information about the shape of a face. This information is then used to identify distinctive features on the surface of a face, such as the contour of the eye sockets, nose, and chin. Another emerging trend uses the visual details of the skin, as captured in standard digital or scanned images. This technique, called skin texture analysis, turns the unique lines, patterns, and spots apparent in a person's skin into a mathematical space.

II REVIEW OF LITERATURE

Firstly we should survey about the basic of face expression recognition like where basic need of this recognition system, which type of classifier we can apply and what already work done on face expression recognition and classifier. The basic classifier is SVM.

Mu-Chun Su, Yi-Jwu Hsieh, and De-Yuan Huang [5]Human face-to-face communication plays an important role in human communication andinteraction. In recent years, several different approaches have been proposed for developing methods ofautomatic facial expression analysis. A simple approach to automatic facial expression recognitionis presented. The proposed system is able to automatically perform human face detection, feature pointextraction and facial expression recognition from image sequences. The facial recognition procedures involvesin two stages. At the first stage, three multi-layer perceptrons (MLPs) are separately trained to recognize actionunits involving in the eyebrows, the eyes and the mouth regions. Then individual expression network wastrained to recognize five basic facial expressions based on the outputs computed from the aforementioned threeMLPs. Experiments were conducted to test the performance of the proposed facial expression recognitionsystem.
Ira Cohen, NicuSebe, Ashutosh Garg, Larry Chen, Thomas S. Huang [6] The most expressive way humans display emotions is through facial expressions. In this work we report on several advances we have made in building a system for classification of facial expressions from continuous video input. We introduce and test different Bayesian network classifiers for classifying expressions from video, focusing on changes in distribution assumptions and feature dependency structures. In particular we use Naive-Bayes classifiers and change the distribution from Gaussian to Cauchy, and use Gaussian Tree-Augmented Naive Bayes (TAN) classifiers to learn the dependencies among different facial motion features. We also introduce a facial expression recognition from live video input using temporal cues. We exploit the existing methods and propose a new architecture of hidden Markov models (HMMs) for automatically segmenting and recognizing human facial expression from video sequences
.**Zhengyou Zhang [8]** in this paper, we report our experiments on feature-based facial expression recognition within an architecture based on a two-layer perceptron. We investigate the use of two types of features extracted from face images: the geometric positions of a set of fiducially points on a face, and a set of multi-scale and multi-orientation Gabor wavelet coefficients at these points. They can be used either independently or jointly. The recognition performance with different types of features has been compared, which shows that Gabor wavelet coefficients are much more powerful than geometric positions. Furthermore, since the first layer of the perceptron actually performs a nonlinear reduction of the dimensionality of the feature space, we have also studied the desired number of hidden units, i.e., the appropriate dimension to represent a facial expression in order to achieve a good recognition rate. It turns out that five to seven hidden units are probably enough to represent the space of feature expressions. Then, we have investigated the importance of each individual fiducially point to facial expression recognition. Sensitivity analysis reveals that points on cheeks and on forehead carry little useful information. After discarding them, not only the computational efficiency increases, but also the generalization performance slightly improves. Finally, we have studied the significance of image scales.
Hehua Chi, Lianhua Chi, Meng Fang, Juebo Wu [12] Facial expression is one of the major features of facial recognition in recent years, and it has become a hotspot. In this paper, we present a novel method

of facial recognition based on cloud model, in combination with the traditional Facial expression system. Firstly, we carry out the transformation from images into grids with M by N, where M and N denote the actual image positioning of the grid. Each grid is a grey value (0-255) and the grids stand for the data from data points to data sets based on cloud model. Secondly, we do data pre-processing for the original facial expressions of input images. Cloud droplets image can be obtained as the input of backward cloud generator in order to extract the three numerical characteristics, that is, Ex, En and He. With these three characteristics, facial expression can be realized. Finally, in order to demonstrate the feasibility of the presented method, we conduct a case study of facial expression recognition based on cloud model. The results show that the method is feasible and effective in facial expression recognition.

II. CONCLUSION AND FUTURE SCOPE

In this work we use SVM technique and LBP feature to improve results of facial expression recognition process. As our results represents that face of person is provided as input in system and after applying the both process we find an image that recognized as corresponding to input image. The recognition process with the combination of both techniques is providing better results as compared to existing technique for facial expression recognition. Hence it is proved in result section that we compare performance of proposed technique with existing technique PCA.

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