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Analysis of Face Recognition system Using SIFT and DRLBP Algorithm

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ABSTARCT: The greatest motivation for designing automatic face recognition is based on human facial features and identification ability. One method is by comparing face features selected from a test image and a face database. Usually a one-to-one or one-to-many schema is used to match the face image of the test item with the gallery data. One-to-one and one-to-many matching is called verification and recognition. On the other hand, feature extraction is usually used to retrieve relevant facial features from the data, such as face area, changes, angles, or measurements. . There are other applications at this stage, such as facial feature tracking or emotion recognition. Appropriate choice of function plays an important role in the performance of face recognition algorithms. This phase involves comparison methods, classification algorithms and accuracy measures On MATLAB Simulation Where Accuracy Achieved 98% .

KEYWORDS: Feature Descriptors, Feature Detectors, Feature Extraction, SIFT, DRLBP

I. INTRODUCTION

Among various feature detector, the scale invariant Feature transformation (SIFT) algorithm is one of the best methods. This algorithm is mainly suitable for multi-level images. The features extracted using the SIFT algorithm are inconsistent with image scaling, rotation, and transition, while partially inconsistent in terms of viewpoint in lighting and 3D camera. The SIFT algorithm is mainly divided into two modules. They are a keyboard detection module and a description generation module. To improve the performance of the algorithm, the method used in the descriptor generator module has been changed. In the existing system, window rotation technology is used which becomes the bottleneck of the key point detection module. In the proposed method is the new window Divided into sub regions and histogram rearrangement techniques along 16 directions in descriptor generation. The descriptor generation module is 15 times faster than The latest solutions. Feature extraction and matching are the basis of many computer vision problems, such as object recognition and stereo matching. Existing work introduces architecture scale-invariant function transformation (SIFT) for real-time extraction of image functions. Among various feature detectors, the Scale Invariant Feature Transform (SIFT) algorithm is one of the best methods. This algorithm is mainly suitable for multi-scale images. Face recognition systems are mainly used as major security measures and user authentication. Faces are easy to recognize, but automatic recognition of faces by machines is a difficult and complex task. Moreover, people cannot always convey the same expression. The expression of his face changed coincidentally with his mood. Therefore, it becomes more challenging to compare faces in different emotions with neutral faces stored only in the database. Many methods of face recognition have been proposed. SIFT has properties that match different images and objects [1]. The SIFT algorithm extracts interesting key points from images to generate feature descriptions. These extant functions are constant for orientation, scaling, light changes and refining transformations. So they are good for facial descriptions

The SIFT algorithm ensures that these descriptors are virtually unchanged in terms of rotation, lighting and in-plane positioning. Therefore, if you want to match features in an image with similar features in another image, you must

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match their descriptions to find the closest matching feature. Provides a "feature" description of the object. This description can be used when trying to find an object in an image that contains many other objects. There are many considerations when extracting these features and how to record them. SIFT image functions provide a set of functions of an object that is not affected by the many complexities encountered in other methods, such as object scaling and rotation. While allowing the identification of objects in larger images, the SIFT image feature also allows the identification of objects in multiple images in the same location, taken from different locations in the environment. The SIFT function is also very resistant to the "noise" effect in the image.

The SIFT method for generating image functions takes an image and converts it into a "large set of local function vectors" (from "Object recognition from local scale invariant functions" by David G. Lowe). Each of these feature vectors is independent of any scaling, rotation, or translation of the image. This method has many functions of neuron response in primate vision. To help extract these features, the SIFT algorithm uses a four-step filtering method:

Scale-Space Detection: This stage of the filtering attempts to identify those locations and scales that are identifiable from different views of the same object. This can be efficiently achieved using a "scale space" function. Further it has been shown under reasonable assumptions it must be based on the Gaussian function. The scale space is defined by the function:

$$L(x, y, \sigma) = G(x, y, \sigma) * I(x, y)$$

Where * is the convolution operator, $G(x, y, \sigma)$ is a variable-scale Gaussian and $I(x, y)$ is the input image. Various techniques can then be used to detect stable key point locations in the scale-space. Difference of Gaussians is one such technique, locating scale-space extreme, $D(x, y, \sigma)$ by computing the difference between two images, one with scale k times the other. $D(x, y, \sigma)$ is then given by:

$$D(x, y, \sigma) = L(x, y, k\sigma) - L(x, y, \sigma)$$

To detect the local maxima and minima of $D(x, y, \sigma)$ each point is compared with its 8 neighbours at the same scale, and its 9 neighbours up and down one scale. If this value is the minimum or maximum of all these points then this point is an extreme.

SIFT Feature Detectors Feature detection is the process of inspecting each pixel to see if that pixel has features. For human movement recognition, the calculated space and time scale and direction can be used to crop the area (patches) centered on the detected pixels. The algorithm used to generate functions and patches can be called a function detector. Function detectors usually select the spatiotemporal position, scale, and direction of a video by maximizing a particular salt function.

Feature Descriptors Feature descriptors are used to describe the detected regions in a representation that is ideally invariant to background clutter, appearance and occlusions, and possibly to rotation and scale Poppe (2010). The spatial and temporal size of a patch is usually determined by the scale of the interest point. For example, after feature detectors detected the features centered at (x, y, t) with the spatial size defined by σ and temporal size defined by τ , the corresponding 3D patch can be cropped, and the feature descriptor is used to summarize the information within that patch. The problem defined in this system is the time required to extract the invariant features from the images very extracted very slow. In order to reduce the time consumption for feature extraction method and to improve the efficiency of the SIFT algorithm the histogram method is used.

II. SYSTEM ARCHITECTURE

The presented system has a architecture. It is composed Input images and recognition results from different modules associated with dependencies Face representation storage is displayed by the face library. For the images obtained from the data set library, the first module processes "size and normalization" and then processes. This preprocessing module

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converts the color image into its grayscale representation and then performs face detection. In the next step, the detected faces are further extracted from the image. This module can also detect the face of an object in the detected face area and transform and resize the face. The feature extraction module is used to create a face representation. It detects SIFT key points and creates a set of SIFT descriptors for face image representation.

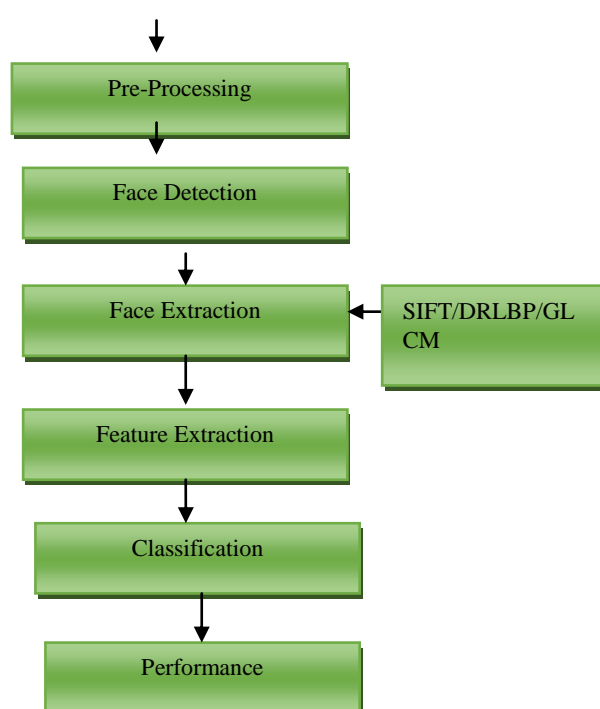


Figure 1 Proposed Flow Chart

The next module is used to select the most representative face vector to create an accurate face model. Then face recognition. The identified face is compared to a face model stored in the "Face Gallery" and the most similar model is selected as the recognized face model. The final confidence measurement module is used to identify whether the recognition result is correct before classification. The storage of the face representation is shown by the Face Gallery. Images taken from data set gallery the first module deals with Resize & Normalization followed by preprocessing this preprocessing module converts a color image into its grey-scale representation, then it performs face detection

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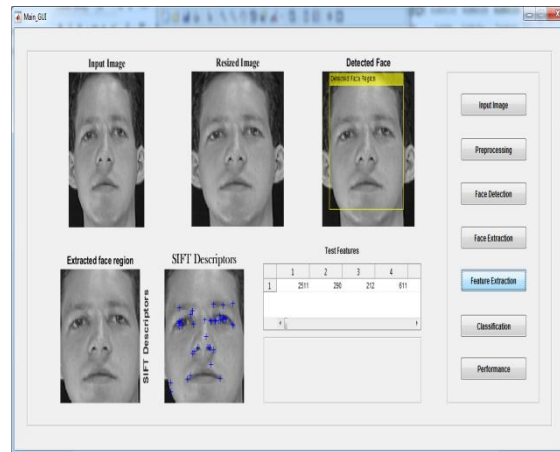
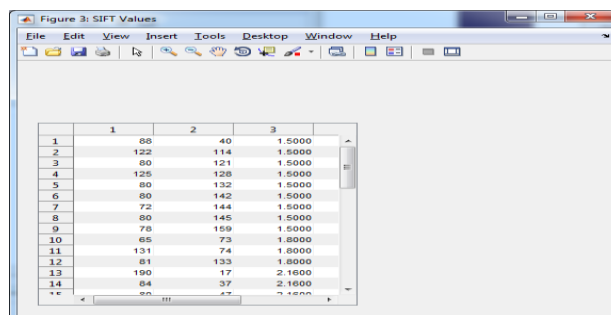


Fig. 2 result window

Then face recognition. A recognized face is compared to the face models stored in the Face Gallery and the most similar model is chosen as the recognized one



Fig 3 GUI Result Window



	1	2	3
1	60	40	1.5000
2	122	114	1.5000
3	80	121	1.5000
4	126	120	1.5000
5	80	132	1.5000
6	80	142	1.5000
7	72	144	1.5000
8	80	145	1.5000
9	76	159	1.5000
10	65	73	1.8000
11	131	74	1.8000
12	81	133	1.8000
13	190	17	2.1600
14	84	37	2.1600
15	80	47	2.1600

Fig. 4 SIFT feature Values

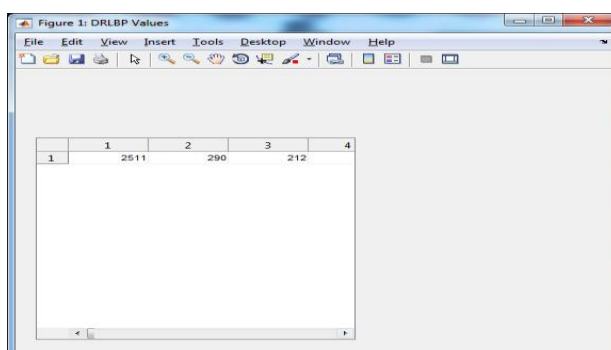
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Vol. 8, Issue 12, December 2019

This module also detects the face of object in the detected face region and transforms and resizes the face. The feature extraction module is used to create the face representation. It detects the SIFT key-points and creates a set of SIFT descriptors for a representation of the face image



	1	2	3	4
1	2511	290	212	

Fig.5 DRLBP feature Values

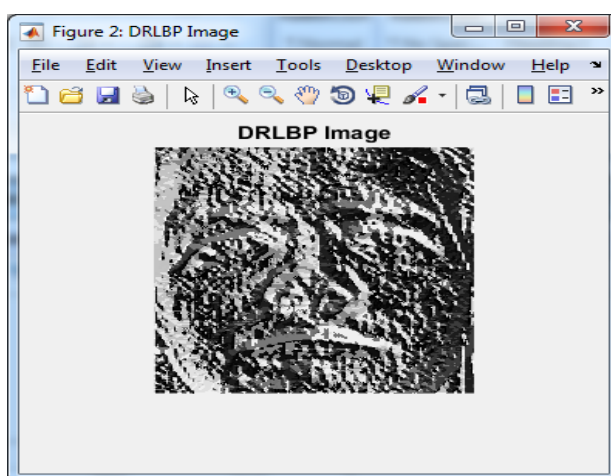


Fig.6 DRLBP Image

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Vol. 8, Issue 12, December 2019

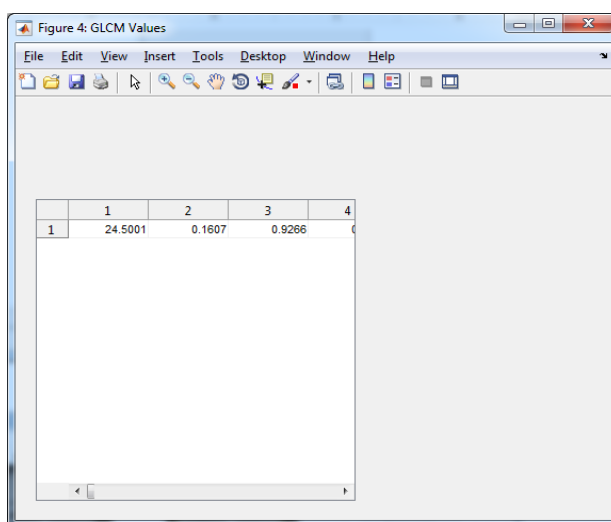


Fig. 7 GLCM feature Values

module is used to select the most representative face vectors in order to create a precise face model The algorithm implemented within this module The last confidence measure module is dedicated to identifying whether the recognition result is correct or not followed by classifier.

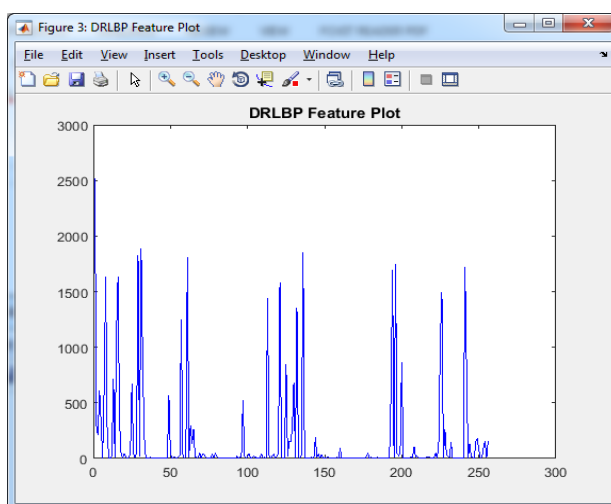


Fig. 8 DRLBP Histogram

CLASSIFICATION The goal of a classifier is to compare the features of a test face image with those of the template and give the final decision in terms of some similarity measures. For face identification, the most widely used classifier is the Nearest Neighbor (NN) classifier. An important issue for designing the NN classifier is how to measure the similarity. A direct way is to measure how similar the two compared images are. Another possible way is to compute the distance between the two image features.

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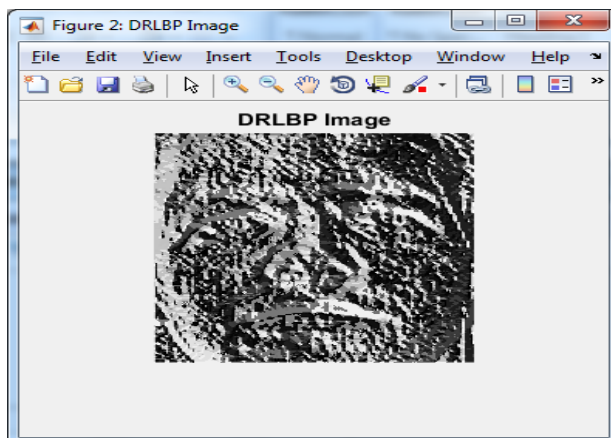


Fig.9 DRLBP Image

The results show that compared to the use of DRLBP and GLCM technology, this method can improve the recovery accuracy. Finally, evaluate performance factors such as accuracy, recall, and accuracy

Table .1 Result Comparisons

PARAMETERS		
S.No	Existing system [M. Sushama]	Proposed system
1	Specificity	99.5
2	Sensitivity	98.72
3	Accuracy	98.7

VI CONCLUSION

In this paper we came into an approach for Face recognition using DRLBP & SIFT Feature Extraction. This can be used by ATM Securities and many more Home appropriate military services. This idea has come through the criminal detection that could help policemen to identify the face of the criminal. Paper on face recognition. This paper is used to find number of true faces and number of false faces are identified. Hence, their accuracy for finding the images is 99% We proposed a framework on can be face recognition using dominant rotate local binary pattern and scale invariant feature extraction to detect whether the person is an authenticate or an unauthenticated. Hence by using the parameters like sensitivity, specificity and accuracy has high performance Accuracy-99.538% Sensitivity-98.7287%, Specificity-98.7287% carried out by matlab simulation .the novelty of the method is reduced database size, as it requires only neutral images to store instead of all the expressions of the same face image

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