ENHANCING THE EFFICACY OF FACE PARODY DETECTION MODEL BY EMPLOYING KNN CLASSIFIER LINKED WITH DWT CALCULATION

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ABSTRACT

The Face parody location is the method which is connected which will order the parodied and non-mock. The DWT calculation will be connected which will break down the literary highlights of the test picture. In the current methodology, SVM classifier is connected which will group the parodied and non-caricature highlights. In this work, KNN classifier is connected with the DWT calculation for face parody location. The proposed improvement will likewise distinguish the satirize faces which are roughly equivalent. The reproduction of the proposed and existing method is done, it is being dissected that exactness is expanded and execution time is decreased.

I. INTRODUCTION

An algorithm utilized for performing some operations on an image for making some changes in it or for collecting some useful information from it is known as image processing. As an output various characters are provided that can further be helpful. There are various region-of-interests present within images, which are also referred to as objects that can be a basis for certain region. Any regularity or patterns present within the data present within the images is identified by the process known as pattern recognition process. When the systems are trained by the labelled training data they are known to follow the supervised learning method within the pattern recognition process. However, the labelling of data through unknown previous patterns is known as unsupervised type of training. The most likely matching inputs are gathered for providing study related to the similar inputs that are present within the system. An instance which is also known as a vector of features is mainly given as an input for achieving certain output. In case where it is difficult to identify the patterns through human visuals, the pattern recognition systems help in providing the facility. The patterns are elicited from the area that is to be analysed and then are bifurcated into several classes. There are three important steps involved within the pattern recognition systems that are pre-processing, feature extraction as well as classification. For the purpose of selecting pattern, the application domain is to be considered by the pattern recognition system. All the domains cannot utilize the similar pattern recognition system. There is a pre-processing of the original input variables for transforming them into some new space of variables within maximum of practical applications. This is done as per the requirement o the specific application. In case of digit recognition issue for example, the translation and scaling of the digits of an image is done in such a manner that each digit is present within a box that is of fixed size. The variability within each of the digital class is minimized to great extent through

this step as there are similar sizes of location and scales present for all digits. This further helps on differentiating the various classes within any pattern recognition algorithm.

Face recognition is a very important in many field of research these days. For the purpose of making enhancement in a raw image which might be achieved from a camera, satellite or any other source, the image processing techniques are utilized within face recognition methods. Mainly the applications of face recognition are involved in automatically identifying or verifying the person from a certain digital image. Selected facial features of an image are compared with the database present within the systems for such identification and verification. Mainly in security systems and biometrics such as fingerprints, iris recognition and so on, these systems can be involved. This application has helped in providing more secure environments in numerous applications. There are various steps involved within this process which are face detection, feature extraction, and face recognition.

Face detection has the main objectives of identifying if there is any human face present within the provided image and the location of the present faces. The patches of the faces present within that image are given as output. The extraction of these patches that contain human-face, from the image is known as the feature extraction process. Once the representation of each face is formulized, the recognition of their identities is the next step which is also known as face recognition step. There is a need to build the face database for attaining automatic recognition. There are numerous images gathered for each person and the features are extracted and stored within a database for matching them in future.

Within the biometric recognition systems, the greatest challenge is the chance of stealing the individual identity of an individual. This is generally known as a spoofing attack which stoles the biometrics data and further exploits or mimics the original data. The unauthorized users can enter the biometric system and the original user can have no knowledge regarding this which thus will destroy the authenticity of the system. The process of showing fake sample to the acquisition sensor that contains facial information of certain user is known as face spoofing process. The fake sample that is presented can be in any form such as picture, video, and so on. There can be image-based as well as video-based face spoofing attacks. For testing the originality of the biometric sample various methods have been proposed which help in detecting the spoofing attack. The proposed methods can be frequency-based, texture-based or motion-based as per their properties.

II. PROPOSED METHODOLOGY

The face spoof Detection is the technique which detects the spoofed information of the faces which wants to take un-authorized of the bio-matrix system. The SVM arrangement strategy is been utilized in the past frameworks for the face parody location. In the current framework for the face parody identification printed highlights of the test picture is dissected utilizing the DWT calculation. The textural highlights will be to act like the preparation set for the order. The after effect of the SVM characterization will order the test picture into parodied or non-ridiculed face. The literary highlights of the ridiculed picture are inexact equivalent to the first picture because of which SVM characterization precision is diminished at times of discovery. In this work, KNN classifier is utilized for the face parody characterization. In KNN classifier, the preparation tests are delineated by n-

dimensional numeric characteristics. Each example speaks to a point in an n-dimensional space. Thus, most of the preparation tests are put away in an n-dimensional example space. Exactly when given an uncertain instance, a k-closest classifier looks in this model space for the k preparing tests that are closest to the uncertain instance. "Closeness" is characterized using Euclidean separation. Not in the slightest degree like choice have tree acceptance and back spread, closest classifiers doled out to make back the initial investment with weight to each characteristic. This may cause disarray when there are numerous unimportant characteristics in the data. Closest neighbour classifiers can in like manner be used for expectation, that is, to give back an authentic esteemed forecast for a given obscure example. For this circumstance, the classifier gives back the normal estimation of the authentic esteemed related with the k closest neighbours of the uncertain example. The highlights of the test picture will be examined with the DWT calculation and on the identified highlights KNN classifier will be connected which will arrange the face into caricature or non-mock.

Pseudo Code of KNN classifier for face spoof Detection

1. Input: Tanning, trained datasets
2. Output: Classified Data
3. Apply DCT ()
    1. For k = 0 To DCTsize – 1
    2. DCT(k) = 0
    3. For n = 0 To DCTsize - 1
    4. DCT(k) = DCT(k) + Waveform(n) * Cos (Pi * k / DCTsize * (n + 0.5))
    5. Next n
    6. Next k
4. Apply Knn classifier
    1. Classify (K, n, X) training data is K, n is the trained data, X is the number of samples
    2. for i=1 to size of the input data do
    3. compute distance d (Xi, x)

End for

    4. Compute set I containing indices for the k smallest distance d(Xix)

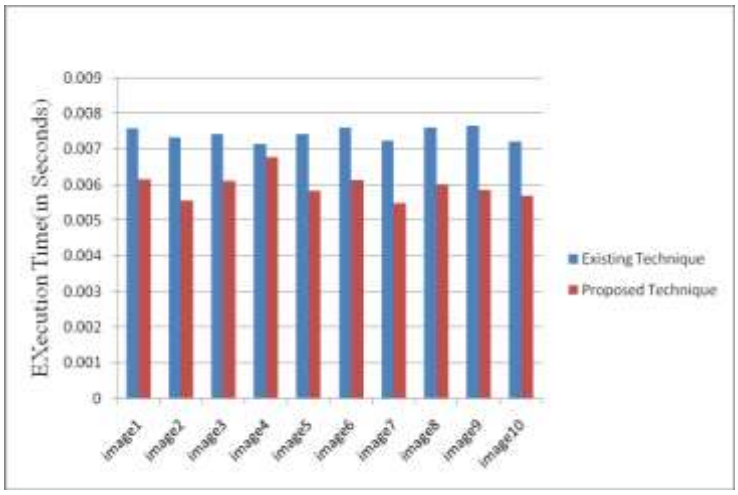
Return majority label for (Yi where i belongs to I}

III. RESULTS AND DISCUSSION

The proposed KNN based face spoof detection algorithm is tested in the 10 test images and also compared with the existing SVM based face spoof detection algorithm. The MATLAB is the tool which is used for the simulation. In the results it is shown that proposed algorithm performs well in terms of Execution time, accuracy, false positive rate and false negative rate.

1) Execution Time: It is the time during which a program is running to compare the proposed technique with existing technique; first Execution time parameter has use. We are measuring Execution time in seconds.

To Calculate the Execution time tic and toc functions are used. Tic defines start of execution and toc defines end of execution.



From above given graph, we can easily compare the execution time difference between the existing and proposed technique. From the graph, it is clear that proposed technique takes less execution time as compare to the existing technique.

2) Accuracy

To compare the proposed technique with existing technique, secondly Accuracy parameter has use.

Accuracy=No. of points classified *100 /Total No. of Points

Accuracy defines how precise is the calculation at taking in an arrangement of appearances from preparing pictures and afterward accurately recognizing similar individuals from a test set of various pictures, where both picture sets contain similar individuals.

3) False Positive Rate:

It is the value of prediction which classifier correctly predicted.

The proposed and existing algorithms are compared with false positive rate. In existing technique, the SVM classifier was applied to classify the features. The SVM classifier has less false positive rate because it uses only two classes to classify the features. In the proposed calculation KNN classifier is utilized which can group the highlights multiple classes because of which it has all the more false-positive rate when contrasted with SVM classifier.4) False Negative Rate:

It is the parameter which gave the values wrongly predicted.

The difference between false negative rate is done between proposed & existing algorithm. False negative rate is the parameter which gave the values wrongly predicted. In the proposed algorithm, the KNN classifier is applied which classify features more than two classes due to which false negative rate is less as compared to proposed algorithm in which SVM classifier is applied.

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IV.CONCLUSION

Face spoof technique is technique which will detect the faces which are spoofed to take un-authorized access. I have taken two databases trained database and testing database. Trained database contains the images of genuine faces and the test database contains the spoofed images. The DCT technique is bean which will detect the textual features from the input. In the existing algorithm SVM classifier is applied which classify spoofed and non-spoofed faces. In this work, it is being concluded that to classify approximate equal classifiers the KNN classifier will be applied for the classification. The results are analysed by accuracy, execution time, false negative rate and false positive rate. It is being broke down that precision is expanded and execution time is decreased and FPR expanded and FNR is diminished in the proposed system.