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IMPLEMENTATION OF FACE RECOGNITION SYSTEM USING MACHINE LEARNING ALGORITHM

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Abstract: This project outlines Face recognition in artificial intelligence as a frequent problem. This application was extensively used in our daily life. Several smart phones were opening phones with facial identification to safeguard private details and used on Facebook to identify instantly when users of Facebook appear in pictures. Several approaches for face recognition have already been suggested but it remains very difficult in real-world situations.

A primary technique to differentiate people depends on various conditions, for example, partial facial occlusion, illumination, and posture variety. This paper aims at designing a face expression recognition approach utilizing machine learning algorithm and CTF (color and texture features) while expression recognition is done by HOG (Histogram Oriented Gradients) features. Here we used supervised machine learning classification using SVM (Support Vector Machine) classifier.

Index Terms: Machine learning, face recognition, support vector machine, HOG, CTF (color and textural features)

I Introduction:

Face recognition systems compare face images with a collected group of images called dataset. Facial recognition analysis has become one of the interesting research areas for experts in human-computer interaction applications in reality. People's identification has been performed by utilizing facial features. Face images are used throughout the globe to recognize persons with citizenship identification, identification cards, social security card, intrusion detection, etc.

This process includes segmentation, isolation, and validation of facial features from the unstable environment and likely real faces. The initial effort to identify face was done by calculating unique facial characteristics such as nose size, brows width, and forehead area. Face recognition was introduced as an authentication tool in the latest gadgets. Smartphone vendors including Apple and Samsung have launched their new mobile phone

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variants with facial authentication functionality The process of face recognition comprises two major steps, the extraction of the feature and the classification. Raw face pictures can take a lot of time to identify as it results from an enormous amount of pixels. The number of pixels must be reduced. This is called reducing dimensional space or removal of features to save time for the phase of the assessment.

The extraction of features corresponds to the conversion of face space into a space of feature. Classification is the mechanism by which the class of variables is predicted. Occasionally classes are referred to as labels or levels. For example, a classifier is utilized to categorize certain characteristics extracted from a face picture and to produce a label that is used to identify a person. It uses principal component analysis for feature extraction purposes and different machine learning algorithms as a classifier.

II Existing Work or Literature Survey:

A principal component analysis (PCA) is an extracted feature algorithm that is dedicated to improving and using in this research work. This approach is expected to examine the dataset collectively, which implies that the image will not be evaluated and its attributes will not be extracted individually due to the intensity of (PCA), which sets the foundation for extracting a feature based on evaluating all datasets. Thus, the empirical data set needs to be properly selected not only for the training stage but also to remove the feature needed to evaluate the data set. It also implies that the feature for one examine image cannot be extracted individually; the test results must be compared and the PCA algorithm applied to the database and the test image must be applied to extract its features.

III Proposed Work:

Newly emerging trend, claimed to achieve improved accuracy, 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.

One advantage of 3D face recognition is that it is not affected by changes in lighting like other techniques. It can also identify a face from a range of viewing angles, including a profile view. Three-dimensional data points from a face vastly improve the precision of face recognition. 3D research is enhanced by the development of sophisticated sensors of capturing 3D face imagery. The sensors work by projecting structured light onto the face.

A new method is to introduce a way to capture a 3D picture by using three tracking cameras that point at different angles; one camera will be pointing at the front of the subject, second one to the side, and third one at an angle. All these cameras will work together so it can track a subject's face in real time and be able to face detect and recognize.

IV Results:

This paper aims at designing a face expression recognition approach utilizing machine learning algorithm and CTF (color and texture features) while expression recognition is done by HOG (Histogram Oriented Gradients) features. Here we used supervised machine learning classification using SVM (Support Vector Machine) classifier to identify and recognize face.

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