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Real Time Face Recognition Attendance System

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ABSTRACT

Face recognition is now one of the most advanced computer vision technologies available. In computer vision, illumination, position, and facial expression, face identification is always a difficult task. In live video images taken with a video camera, face recognition tracks target objects. It is a system application for automatically identifying a person from a still image or video frame in simple terms. We proposed an automatic facial recognition method in this paper. Face detection, feature extraction, and identification algorithms are used in this application, which automatically detects the human face when the person in front of the camera recognizes him. For face detection, we employed the Haar Cascade Algorithm, which uses a Haar cascade classifier to recognize human faces. The test is carried out in real-time. The experiment is carried out in a real-time setting. The testing result indicated a satisfactory outcome with an average recognition rate of 87.5 percent using 5 faces image data taken 100 times. The experiment is carried out in a real-time setting. The testing result indicated a satisfactory outcome with an average recognition rate of 87.5 percent using 5 faces image data taken 100 times.

Keywords— Face detection, Face feature extraction, face recognition, Haar Cascade Algorithm

INTRODUCTION

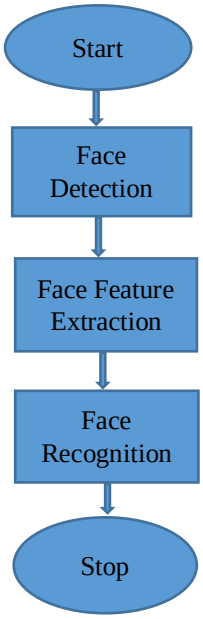
A face recognition program is a piece of software that can authenticate a person's identity and identify him or her from a video or photo. Earlier work on facial recognition can be traced back to engineering literature for psychology at least as far as the 1950s and 1960s. Experiments on Darwin's emotions for facial expression were among the first findings. Facial recognition may be done rapidly and consistently using the Intel OpenCV open-source platform (Media, 2008) [1] (Media, 2008). Preferred facial features are one approach to getting from a face to an image database. It is utilized in security systems, and thumb recognition systems, and is often compared to biometrics such as fingerprints and eye reconnaissance systems. Using Fisher face algorithms for key element analysis Other Our project's goal is to develop a dependable application that will allow every fresh concept to come to reality. We created a crowdfunding platform that is built on the common recognition algorithms included the Markov model, multilinear subspace learning employing tensor representations, anxiously driven dynamic reference, matching, and so on. The Intel open-source computer-View library makes programming simple. Face detection, face tracking, and facial recognition are among the advanced features available. It has the benefit of being a multi-platform framework, which means it can run on Windows

FACE DETECTION ALGORITHMS

The currently available algorithms are:
A. Haarcascade_frontalface_default.xml
B. Eigenfaces see create Eigen Face Recognizer
C. Fisher (Placeholder3) faces
See create Fisher Face Recognize

Haar Cascade for Face Detection

A Haar cascade is a collection of "square-shaped" functions that collectively create a wavelet family or base. It also focuses on "Haar Wavelets," which employ a hair wavelet method to organize pixels on a picture into squares, as recommended in the 2001 paper "fast object recognition utilizing an upgraded cascade of simple characteristics." It's a computer-based learning method that uses a large number of positive and negative representations to build a cascade function. After that, it's utilized to detect objects. The "features" recognized by the hair cascades were computed using "integral image" concepts.



EXPERIMENTAL RESULT

The experiments were implemented in a real-time environment. The training data is obtained from 5 samples face with each sample taken 100 times with normal expression. Therefore, we have 500 faces image data. We collect also two samples of face images taken 100 times and the total data is 200 faces image data. The total data to be recognized is 700 faces image data.

Training Data of Six sample

Training Data of Six samples

METHODOLOGY

A. Overview

Face detection, face feature extraction, and face recognition are the three stages of our proposed approach. The first stage is completed with the use of a Haar-like filter. In the second stage, the Haar algorithm is employed to extract the featured face. The final stage is carried out with the help of a neural network. This section delves into the specifics of each level. This article's proposed method is described in detail.

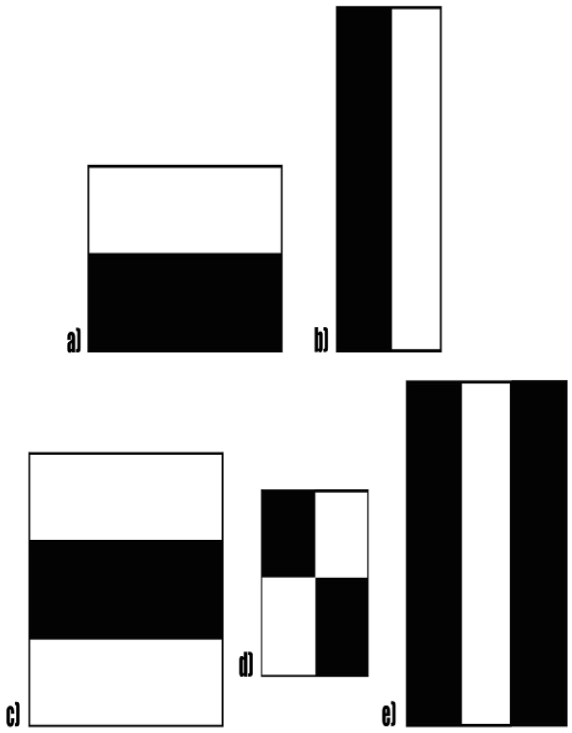
Face detection

This article uses Haar-like a feature or Haar cascade classifier to detect the face region. The operating system, allows an application to run on public nodes. Haar-like feature is a rectangular feature that is indicated specifically on the image. The idea of the method is to recognize the object based on the simple value of the feature. It is not based on the pixel value of the entire image.

The Haar-like feature is a rectangular feature that gives a specific indication to an image. The Haar-like feature recognizes an object based on a simple feature that is not a pixel image. The method only processed a pixel in the rectangle area, not the whole image. Because the process of the Haar-like feature is done on many levels Haar-like feature is known as the Haar cascade classifier as shown in Fig. 2. From the figure, if the rectangle area cannot find the face region, the image is defined as not a face image otherwise it is defined as a face image. The face images are then stored in the database

to be called when the recognition process is performed. The Haar cascade process the image in the rectangular region. Each rectangular is processed to obtain the different threshold that is shown in the black and white area. If the pixel number of the white area compares to the black area is more than a certain threshold, it is said that the area contains a face image. Otherwise, the rectangle area will search for another area in the image. If it is found the area is more than a certain threshold, the area can have a face image inside it.

Feature

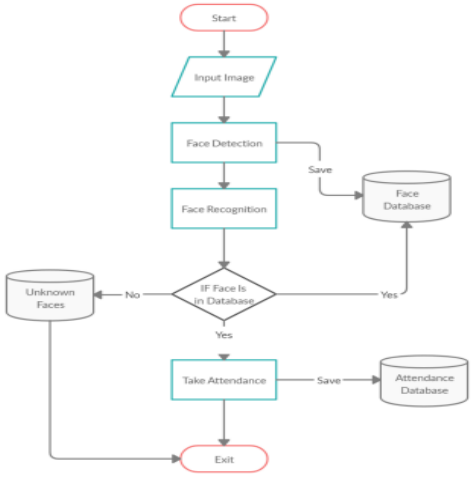


Feature Extraction

Feature Extraction is a technique for reducing the number of features in a dataset by generating new ones from existing ones (and then discarding the original features). The majority of the information contained in the original set of characteristics should be summarised by this new reduced set of features. The process of extracting face parts such as eyes, nose, and mouth from a human face image is known as facial feature extraction. Eye localization and detection are crucial among all facial features, as it is through this that the locations of all other facial features are determined.

Face Recognition

Face Recognition is a visual pattern recognition issue in which the face, which is represented as a three-dimensional object and is susceptible to fluctuating illumination, position, and other aspects, must be identified using recorded photographs. Face Recognition is thus essentially the task of identifying a previously observed face as a known or unknown face, and in more advanced circumstances, determining who it belongs to



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FUTURE WORK

Face recognition technology has been widely used in security and financial fields because of its convenience. With the rapid development of science and technology, the application of faces will be more developed, and the application scenarios will be more diverse. However, face recognition will easily cause technical, legal, and ethical problems. Due to the automated features of face recognition technology, similar related information may be processed or decided through automation, lacking transparency and not easy to supervise and even in the event of errors or discrimination. It is difficult to trace back. For example, face recognition information is used to achieve nonrecognition purposes such as judging an individual's sexual orientation, race, or religion. How to enhance the interpretability of algorithms to avoid discriminatory algorithms or incomplete information that will lead to decision errors.

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Conclusion

Using face recognition algorithms, this system tries to provide an effective class attendance system. The suggested technology will be able to track attendance using facial recognition. It will use the webcam to detect and recognize faces. It will mark the recognized student's attendance and update the attendance record after recognition. Face recognition technology has progressed significantly with the advancement of science and technology, but there is still potential for improvement in terms of practical use. There may be a specific camera for face recognition in the future, which can increase image quality and solve image difficulties.

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