CLASSROOM ATTENDANCE MANAGEMENT SYSTEM USING FACE RECOGNITION

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Abstract - *Face detection has gained tons of recognition within the domain of Image processing within the previous couple of years and researchers are ready to implement it in numerous fields of our standard of living as well as security functions, gender classification, human laptop interaction, biometric management etc. This paper aims toward another self-made implementation of group action system exploitation face detection. Manually taking group actions by academics cause tons of manipulation and tons of confusion now and then. It additionally saves the time spent on count the scholars and taking group action that successively are often used for betterment of scholars. Our group action system compromises of 4 steps i.e. making a info, taking a photograph, face segmentation, matching the face with the info.*

Key Words: Attendance; face; recognition; detection; database; dataset; training.

1. INTRODUCTION

Manually taking attendance causes a innumerable discrepancies within the attendance report and chances are high that there of manipulation of information. Additionally, it makes the teacher's job tedious and a few quantity of your time out of total assigned time for teaching leads to a complete wastage. Face detection is enforced here to mark the attendance. The image is captured throughout the category hours. Faces of scholars area unit detected, segmental and keep for verification with info. When the made match of faces, the attendance is marked by itself.

2. LITERATURE SURVEY

The authors' previous work [1] introduced one solution for attendance system using finger print scanner. In [2],the research illustrates an approach for implementing an automated attendance management system for students of a class by making use of face recognition technique, by using Eigen face values, Principle Component Analysis (PCA) and Convolutional Neural Network (CNN).In [3] system uses Max Margin Face Detection (MMFD) technique for the face detection and the model is trained using the Inception-V3 CNN technique for the students' identification. In [4] the research illustrates a model which will integrate with the face recognition technology using Personal Component Analysis (PCA) algorithm. In [5] model is composed of several essential steps developed using today's most advanced techniques: CNN cascade for face detection and CNN for generating face embedding. In [6] paper aims to propose a face recognition-based mobile automatic classroom attendance management system needing no extra equipment. In [7] Arduino is used to create and control the system that could automatically mark the attendance for the students. In [8] various techniques like illumination invariant, Viola and Jones algorithm, and Principle component analysis are used.

3. EARLIER WORKS

Face detection victimization LBP was projected by Jo Chang-yeon. His paper describes however the LBP works and the way it's used for face recognizing. The end result of his paper was that LBP is less complicated than haar-like options and quicker to discriminate between faces and non faces.

Face detection and recognition for automatic attending system was projected by Dr. Nita Thakare, Meghna Shrivastava, NidhiKumari, Neha Kumari, Darleen Kaur, Rinku Singh that aims at the potency of the system. Automated attending Management System victimisation Face Recognition was projected by Mrunmayee Shirodkar, Varun Sinha, UrviJain, Bhushan Nemade. Their paper describes the important time automatic attendance system. Their developed algorithm in taking attendance is achieving 83.2% efficiency.

4. System Architecture

1. Creating the database
2. Capturing the image
3. Face detection and segmentation using
4. Haar Cascade
5. Face recognition using LBP
6. Attendance marker

A. Creating the database:

Info of all the scholars are going to be created by using python and opencv. It's a former method in order that we'll have true time info to coach our system and to match the captured faces. For making a person's info, the person has got to sit ahead of the camera around 80cms faraway from the camera with light-weight on the other facet of the face. The camera should be at level of the face of the person. Once the code runs, the person has got to offer eight poses with totally different expressions in order that info of various varieties of image gets created. The poses often want sideways, up down or any direction during which face is visible. The expressions to be recorded are often happy, sad, bored, yawning etc. additionally the faces detected from the captured pictures are going to be other to the info in order that the info is updated ceaselessly. Once the info is finished we tend to square measure prepared with our implementation half.

B. Capturing the image

A high definition camera are going to be put in within the room higher than the board in order that it might capture all the scholars gift within the category. The camera may be manually controlled or programmed as per the selection of the user. When capturing the image, it'll be sent to the system for more process.
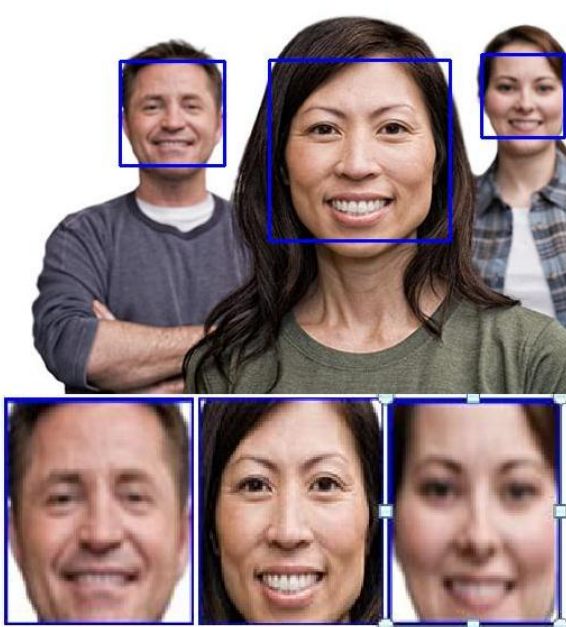
C. Face recognition using LBP

Once the entire faces area unit divided into completely different faces, we'll run the face recognition code. every of the faces from the actual date folder are going to be checked with the info mistreatment the native binary pattern algorithmic rule and if similar face is found the exposure are going to be added to the info for higher potency in future.

D. Attendance Marker

If a face from the actual date folder is matched with the information, then the actual student are going to be marked present. Following an equivalent procedure, we'll have list of all students who were present within the category. Remainder of the category students are going to be marked absent.

## 5. Proposed Algorithm

A. Viola jones algorithm [1]

It is used for face Detection

1. Haar like features
2. Intergral Image
3. Cascading

This algorithmic rule trains a system to spot the distinction between face pictures and non-facial pictures. We tend to extract the options of a face image and store it in an exceedingly file, if a given input image processes all the comparison within the file then it's recognized as a facial image. we are classifying the image is whether or not a face or a non-face image, simply by pertaining to the file, that is already hold on within the information.

A.1. Haar –like features

There is totally different style of haar feature that square measure applied on the image to examine whether or not the feature exists within the image. The 24X24 window is applied everywhere the image, during which for every operation, we tend to square measure
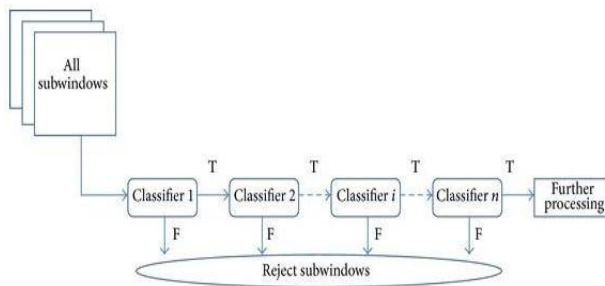
Subtracting the add of pixels in white region with, add of pixels in black region that output associate whole number price, that determines the validation of the corresponding feature.
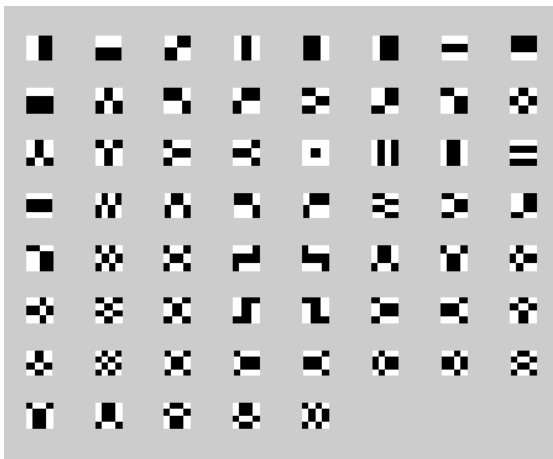
For every 24X24 window we tend to find yourself shrewd nearly a 160,000 options, as a result of in every scale of image each feature is understood all told potential dimensions,
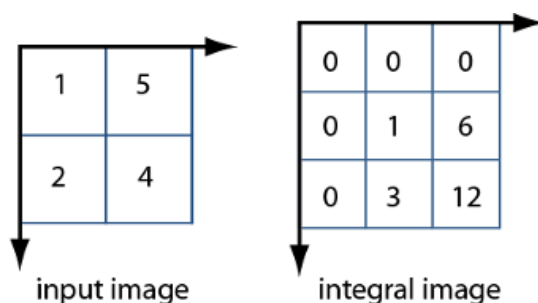
A.2. Integral Image

This methodology reduces the value of shrewd add of pixels whereas corroboratory a feature. We tend to do identical by taking solely the corner element values. For a given input image, or obtaining integral image, we tend to add up all elements that area unit falling to the left and prime region of the pixel. The advantage of the integral image is; it reduces the computation by four times.

A.3 Cascading:

If we've got associate input image say 640X480, we've got to perform 2500 feature validations for every 24X24 window, and take the linear combination of all those classifiers for validation. In cascading, we tend to divide these 2500 options into set of stages within which the amount of options will increase in ascending order. The advantage is we will reject any non-face image with less time, while not process for each and every feature.

B. Local Binary Pattern

Local Binary Pattern is an algorithmic program that relies on the feel of the thing. However, in contrast to alternative texture based mostly algorithms that typically uses a worldwide threshold, this algorithmic program computes the native illustration of the feel. The steps within the algorithmic program are:

1. Convert the image into grayscale image.

2. For every picture element within the image, take neighborhood of size = r(say 8) round the picture element

3. Calculation of the LBP worth goes like this. Any worth larger than the Centre picture element (threshold) is assigned a worth one whereas others lesser then the brink are assigned zero.

4. They're then written in an array of length eight in dextrorotatory or anti- dextrorotatory direction from the primary picture element.

5. Finally, the LBP worth for the picture element is calculated by multiplying the values of the array with values adequate two raise to the facility the index of the array.

6. This LBP worth for every picture element hold on in a very second array of size same because the size of the input image

7. A bar chart of the frequency of every variety over the cell (the variety larger and therefore the variety smaller) is premeditated.

8. The bar chart is then normalized.

9. Thus, we have a tendency to get 256 bin histograms.

10. Finally, the histograms cherish all the cells are concatenated to induce the ultimate feature vector.

There is totally different neighbour size obtainable for LBP operator. As an example, (LBP4, 1) uses four neighbours on a circle of radius 1. Similarly, (LBP16,2) consists sixteen neighbours on a circle of radius a pair of. So normally, LBPP, R refers to P pixels on a circle of radius R. These basic patterns area unit as those with a tiny low range of bitwise transitions from zero to one and contrariwise. As an example, 00101110 and 10110001 contain four transitions whereas 00010110 and 01110110 contain three transitions then on.
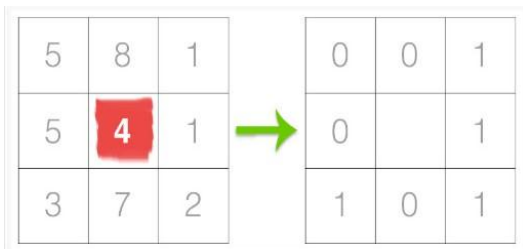
6. Conclusion

The good and automatic attendance systems are often verified as an economical system for classroom attendance. By using this method, the possibilities of fake attendance and proxies are often reduced. There square measure an uncountable biometry Systems which may be used for managing attendance; however the face recognition has the most effective performance. Therefore we'd like to implement a reliable and economical attending system for room attending which may work for multiple face recognition at just one occasion. Conjointly to implement this method, no any specialized hardware is needed. A camera device and a standalone laptop, info servers square measure ample for constructing.

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