IMAP- INTELLIGENT MANAGEMENT OF ATTENDANCE PROCESSING USING VJ ALGORITHM FOR FACE DETECTION

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Abstract- Every institute has its own methodology during this regard. Some area unit taking group action manually mistreatment the recent paper or file based mostly approach and a few have adopted strategies of automatic group action mistreatment some biometric techniques. The biometric systems on the market for face detection area unit time intense and need lots of cupboard space additionally the scholars need to stay up for an extended time to induce their group action marked. Face recognition technique is employed to boost potency and accuracy of detection method. In our project we tend to use the face recognition system for the aim of marking group action mechanically. A camera is employed to require the image of the administrator through wireless fidelity. The algorithmic program we tend to use is employed to extract the options of the face. The options area unit checked with the information and therefore the group action for everyone who is gift is marked.

I. INTRODUCTION

In recent years, face recognition has attracted abundant attention and its analysis has quickly dilated by not solely engineers however additionally neuroscientists, since its several potential applications in pc vision communication and automatic access system. It is necessary to maintain attendance for all the institutes for checking the performance of scholars. Every institute has its own mechanism in this regard. Some area unit taking attending manually mistreatment the previous paper or file based mostly approach and a few have adopted strategies of automatic attending mistreatment some biometric techniques. However in these strategies students have to be compelled to stay up for long term in creating a queue at time they enter the room. The photographs unendingly observe and acknowledge all the scholars within the room. So as to avoid the false detection we have a tendency to area unit victimization the skin classification technique. This system enhances the potency and accuracy of the detection method. Within the existing system, for the frontal read, the metameric face region is subjected to a multi-detector processing: per facial part (eyebrows, eyes and mouth), one or additional abstraction samples of its contour area unit generated. From every spatially sampled contour of a facial part, we have a tendency to extract variety of points. In Linear discriminant analysis (LDA), the classification tree will type digital pictures. This has been projected within the literature together with facial attributes and Zernike moments. In our work, we have a tendency to gift the look and implementation of Pyramid-like Face Detection (P-FAD)[1], a period of time face detection system. to extend the potency of the face detection rule, Viola and Jones (V-J) is employed for detection and its accuracy are often raised if the skin is classed. After the detection of faces from the photographs, the next step is cropping of every detected face. The rule uses the technique of threading to reinforce the speed of rule. Each and every cropped image is allotted to a separate thread for the popularity functions. Our projected methodology analysis shows that P-FAD outperforms V-J detector graduated color detector (VJ-CD) and color detector followed by a V-J
The authors gesture principal tendency to propose a replacement model, referred to as "Associate-Predict" (AP) model, to deal with this issue. The associate-predict model is constructed on an additional generic identity information set, during which every identity contains multiple pictures with massive intra-personal variation. Once considering two faces below considerably completely different settings, we have a tendency to initial "associate" one input face with a like identities from the generic identity data set[6]. The authors proposed a general classification rule for (image-based) beholding. This new framework provides new insights into two crucial problems in face recognition: feature extraction and hardiness to occlusion. For feature extraction and hardiness to occlusion. For feature
extraction, we tend to show that if meagerness within the recognition downside is correctly controlled, the selection of options is not any longer vital. What’s vital, however, whether the amount of options is sufficiently giant and whether the distributed illustration is properly completed [7]. The authors, discussed to introduce a unique algorithmic rule for face recognition from video, sturdy to changes in illumination, create and also the motion pattern of the user. This was achieved by combining person-specific face motion looks manifolds with generic pose-specific illumination manifolds, which were assumed to be linear. We shall investigate many enhancements to the tactic. Firstly, by using an additional refined coefficient model, we hope to implicitly model nonlinearities within the pose-specific illumination subspaces. Another attainable improvement, we shall be considering is that the use of similar illumination-invariant image filters for precise create matching between faces from two manifolds [8].

III. PROPOSED SYSTEM:

In the planned work, the technique of Voila and Jones [Ref] is used. Face recognition techniques can be divided into two types, namely appearance based and feature based. In the appearance based approach, texture options applied to whole face or some specific regions in the face. Feature based approach mostly uses geometric options like mouth, nose, eyes, eye brows, cheeks and the relation between them. This work describes the economical algorithmic rule that mechanically marks the faces of attendees (students/scholars) without any human intervention. The faces of attendees are recorded by using a camera connected in front of a room focusing towards the students which captures the pictures of scholars. Then the captured pictures are sent to image processing module through wireless medium (ZigBee). In the Image processing module, the quality of captured images is enhanced by removing noises from the images. The enhanced image is fed to Segmentation module where the observed face in each frame is compared with the previously stored faces and identifies the students using V-J skin detection algorithm. This paper introduces the economical and correct technique of identifying students within the class room. The detailed architecture of the proposed system is given in figure 1.

Figure 1 System architecture

3.1 IMAGE ACQUISITION

Figure 2 is the image of a student in a class room and it is taken using a Webcam. The picture of the classroom is taken with the help of an Android Smart Phone and sent to the administrator through WiFi. The image is stored in the administrator’s system, where the image is processed for face detection.

The picture can be taken with a normal camera of a phone using the IPWebCam application, which is an android application that is used to transfer an image file which can be of any format through a WiFi network to the required destination.

3.2 IMAGE ENHANCEMENT

An image which is captured must be enhanced to produce better results. Image enhancement is called as image preprocessing. It is done to bring out specific features of the image. It highlights certain characteristics of the image. This is done so that the result image is more suitable than the original one for specific applications. There are two categories in the image enhancement. They are spatial domain method and frequency domain method. In the spatial domain method, the manipulation is done directly on the pixels of the image. This process is called as point processing or masks processing. On the other hand, the frequency domain method modifies the ET of an image. It is a combination of both frequency and spatial domains. Image enhancement is a combination of noise removal, skin classification, and histogram normalization.
3.2.1 Noise removal

If the image is scanned from a photograph made on film, the film grain is a source of noise. Noise can also be the result of damage to the film, or be introduced by the scanner itself. If the image is acquired directly in a digital format, the mechanism for gathering the data (such as a CCD detector) can introduce noise. Electronic transmission of image data can introduce noise. To simulate the effects of some of the problems listed above, the toolbox provides the noise function, by which you can use to add various types of noise to an image.

3.2.2 Histogram Normalization

The Normalization module stretches an image’s pixel values to cover the entire pixel value range (0-255). The function processes each color band (RGB) and determines the minimum and maximum value in each of the three color bands as shown in Figure 3. Once these values are computed the image is reprocessed by subtracting the minimum value of each band from each pixel and dividing by its max-min range (3 times for each RGB pixel). This has the effect of stretching the pixel value to the full 0-255 pixel value range. Visually the image appears to have increased in contrast.

3.3 SKIN DETECTION BY V-J ALGORITHM

Face detection has been regarded as the most complex and challenging problem in the field of computer vision, due to the large intra-class variations caused by the changes in facial appearance, lighting, and expression. Such variations result in the face distribution to be highly nonlinear and complex in any space which is linear to the original image space. Moreover, in the applications of real life surveillance and biometric, the camera limitations and pose variations make the distribution of human faces in feature space more dispersed and complicated than that of frontal faces. It further complicates the problem of robust face detection. Any of the methods can involve color segmentation, pattern matching, statistical analysis and complex transforms, where the common goal is classification with least amount of error. Bounds on the classification accuracy change from method to method yet the best techniques are found in areas where the models or rules for classification are dynamic and produced from machine learning processes. Paul Viola and Michael Jones presented a fast and robust method for face detection which is 15 times quicker than any technique at the time of release with 95% accuracy at around 17 fps.

3.4 DATA BASE

A database is an organized collection of data. The data is typically organized to model aspects of reality in a way that supports processes requiring information. Department of Defense Counterdrug Technology Development Program Office sponsored the Face Recognition Technology (FERET) program. The goal of the FERET program was to develop automatic face recognition capabilities that could be employed to assist security, intelligence, and law enforcement personnel in the performance of their duties.

3.5 SEGMENTATION

Image segmentation is the process of partitioning an image into multiple segments. The goal of segmentation is to simplify and/or change the representation of an image into something that is more meaningful and easier to analyze. Image segmentation is typically used to locate objects and boundaries in images. More precisely, image segmentation is the process of assigning a label to every pixel in an image such that pixels with the same label share certain characteristics.

IV. RESULTS AND DISCUSSIONS

4.1 Face detection

We collected a sample dataset from our college students consisting of around 15 images. We use a FERET database which was created with a set of a number of images from the internet with different people of different races and features. We tested the accuracy with this sample dataset for individual faces and the detection percentage was very accurate. There were two different images of the same person in the database and even with different hairstyles the detection percentage was accurate, as we use neural network technology.
4.2 Assumptions

We assume that the background in the group image is not very bright and the image is of high quality, say more than 2MP. The size of the image may vary but our algorithm converts it into 300x300 pixels.

Figure 2 Image Acquisition

Figure 3 Histrogram Normalization

Figure 4 Skin detection

V. CONCLUSION AND FUTURE WORK

The new system could finally make human-level face recognition possible in all educational institutions and also offices. It simply reduces the time for taking attendance. Just a photograph of a classroom with students is sufficient. Every hour the picture sent from the classroom to the administration through WiFi is used to automatically detect faces. This actually reduces time and effort taken to take attendance.

The V-J algorithm used in this project increases efficiency in face detection, no matter how bad the lighting conditions are. The faces in a picture can be efficiently cropped automatically, even if there are a hundred faces in the picture. After the image enhancement process in the V-J algorithm the efficiency achieved in 95%.

The first task in any program of automated face verification is to build a decent dataset to test the algorithm with. That requires images of a wide variety of faces with complex variations in pose, lighting and expression as well as race, ethnicity, age and gender. Then there is clothing, hair styles, make up and so on. As luck would have it, there is just such a dataset, known as the Labeled Faces in the Wild benchmark. This consists of over 13,000 images of the faces of almost 6000 public figures collected off the web. Crucially, there is more than one image of each person in the database. Luckily the detection percentage remains 95% after testing with different images of the same person.

From the results we can conclude that the proposed system shows better results as faces in different orientation and environment are also recognized. Also in the future, the automated attendance system can be a smarter way for marking attendance.
future we can add more features to the attendance system such as automatic updates in the student’s web portal. Also this technique can be added to live video streaming where the faces can be recognized from a webcam or CCTV cameras attached in the public to enable easy detection of theft and crime.

REFERENCES


