

## **FACE RECOGNITION IN A VIDEO AGAINST VARIATION IN ILLUMINATION**

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*Abstract- The use of video sequence for face recognition and image processing has relatively studied less than the image based approaches. However every system has its own challenges, while tracking a face in a video is a big system within. This paper presents a framework for a video based face recognition against the challenges of illumination. It is because an individual's face appears differently in different images yet many people may look somewhat similar to each other under some conditions well, we are only concentrating only on the factor of variation in illumination using the algorithm Viola Jones.*

### 1. INTRODUCTION:-

There are several reasons for recent increased interest in face recognition, including rising public concern for security, the need for face analysis and modeling techniques in multimedia data management and computers entertained. Face recognition being the most important biometric, still it still faces many challenges, like illumination. Identifying faces through a digital eye is not an easy nut to crack. There has to be a system which is capable of recognizing the face capture even in poor lighting conditions. Although many approaches have been proposed during last decade; however, real world scenarios remain a challenge.

### 2. PROPOSED ALGORITHM:

#### 1.The Viola Jones Algorithm:

The simple principle of the Viola-Jones set of rules is to scan a sub-window capable of detecting faces across a given input photo. The trendy photo processing method might be to rescale the input photo to one of a kind sizes after which run the fixed length detector through these pix. This method turns out to be instead time consumption because of the calculation of the exclusive size images. Contrary to the standard approach Viola-Jones rescale the detector instead of the enter photo and run the detector frequently via the picture – each time with a extraordinary size.

The face detection is carried in four stages,

1. Haar feature selection
2. Creating an internal image
3. Adaboost training
4. Cascading classifiers

#### Step 1: The scale invariant detector

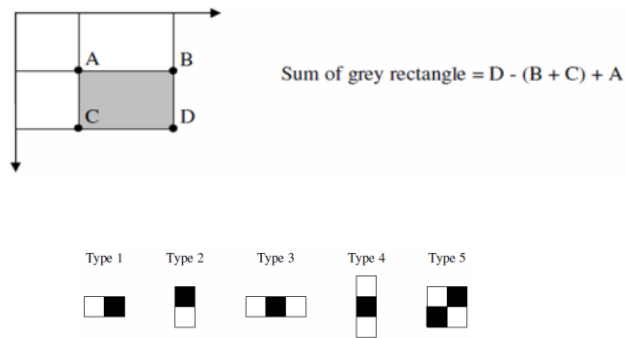
1	1	1
1	1	1
1	1	1

Input image

1	2	3
2	4	6
3	6	9

Integral image

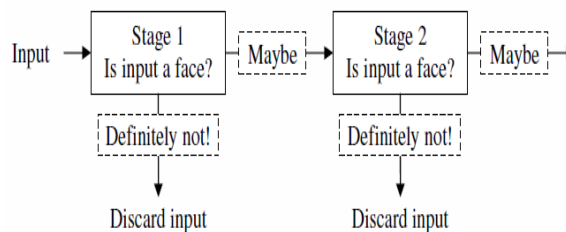
**Step 2: The Integral Image**



**Step 3: The modified AdaBoost algorithm**

$$h(x, f, p, \theta) = \begin{cases} 1 & \text{if } pf(x) > p\theta \\ 0 & \text{otherwise} \end{cases}$$

**Step 4: The cascaded classifier**



**3. FACE DETECTION FROM A VIDEO**

Detecting and locating human faces and facial features in an image sequence are important tasks in dynamic environment such as videos, where noise conditions, illuminations, locations of subjects and pose can vary significantly from frame to frame.

The detection and tracking of face in video sequence is based on the fuzzy geometrical face model and motion estimation is presented. The feature extraction process is performed in the support region which is determined by the fuzzy rules to detect face in an image frame. Then the consecutive frames from video and their corresponding optical flow are used for tracking face in the video sequence.

All identification or authentication technologies operate using the following four stages,

1. Capture
2. Extraction
3. Comparison
4. Match/Non match

How does the face recognition system work?

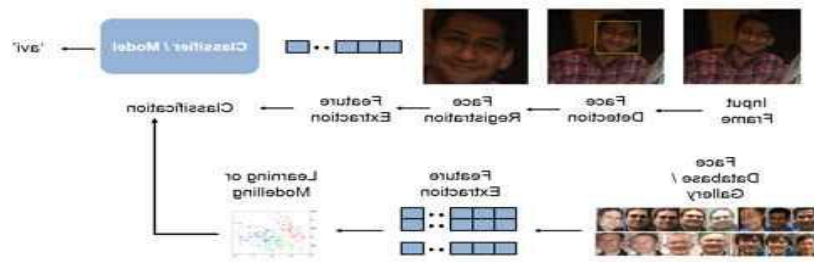


Figure 1. Diagram for working of face recognition

Template matching:-

It compares match templates against enrollment templates. A series of images is acquired and scored against the enrollment, so that a user attempts take place within 1 to 2 seconds. If you look at the mirror, you see that your face has certain distinguishable land marks. These are the peaks and valleys that make up the different facial features.

There are 80 nodal points that are measured by the software

1. Distance between the eyes
2. Width of the nose
3. Depth of the eye socket
4. Cheekbones
5. Jaw line
6. Chin

#### 4. CHALLENGES IN FACE RECOGNITION

Though face recognition have been a grown up research area, however, there still remain many problems that must be overcome to develop a robust face recognition system that works well under various circumstances.

1. Illumination
2. Pose
3. Occlusion
4. Expression
5. Illumination and expressions
6. Illumination and pose

#### 5. APPROACHES TO VARIATION IN ILLUMINATION

Illumination problem arises due to uneven lightening on faces. This uneven lighting brings variations in illumination which affects the classification gets affected due to this variations. We will use the respective algorithms that are used for each approach along with the comparison between the results obtained by each algorithm on the basis of their complexity & accuracy .a simple way is to set a threshold and discard those pixel that have an intensity change greater than the threshold .the image is divided into parts from the region where similar surface appears.

#### 6. RESULT AND CONCLUSION

In this paper we have proposed a method for video based recognition that relies on good & bad frames for integrating illumination for describing the appearance of a video sequence. We started with the brief exposition of the theoretical result followed by methods for learning the system. Then we described our recognition algorithm that relies on synthesis of video sequences under the conditions of illumination . Finally, we demon started the effectiveness of the method on video database with large and arbitrary variations in pose illumination..The efficiency of the proposed system is based priority on illumination variation. This method is verified & the limitations of the scheme are observed through testing and debugging codes .and then, limited by MATLAB performance he speed of the face recognition system is evaluated.

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