

# Automatic Attendance Using Image Processing Techniques

M. Parthasaradhi<sup>1</sup>, M. Anil Kumar<sup>2</sup>, K. Jagadeesh<sup>3</sup>, K. Pavan Kumar<sup>4</sup>, V. Bharani<sup>5</sup>

<sup>1,2,3,4</sup>UG Student, Department of Electronics and Communication Engineering, Audisankara College of Engineering & Technology, Gudur, India

<sup>5</sup>Associate Professor, Department of Electronics and Communication Engineering, Audisankara College of Engineering & Technology, Gudur, India

**Abstract:** Nowadays, the research is growing towards the invention of new approaches. One such most attracted application is face recognition of image processing. There are several innovative technologies have been developed to take attendance. Some prominent ones are biometric, thumb impressions, access card, and fingerprints. The method proposed in this paper is to record the attendance through image using face detection and face recognition. The proposed approach has been implemented in four steps such as face detection, labelling the detected faces, training a classifier based on labelled dataset, and face recognition. The database has been constructed with the positive images and negative images. The complete database has been divided into training and testing set and further, processed by a classifier to recognize the faces in a classroom. The final step is to take the attendance using face recognition technique in which the input image of a classroom is given, and faces of the given image will be detected along with their IDs. The frames of a video taken for a minute is taken into consideration to avoid the missed ones due to rotational issues.

**Keywords:** Attendance Maintenance, Biometric System, Face Detection, Face Recognition, and Haar Cascades

## 1. Introduction

Face insistence is a basic use of Image managing inferable from its utilization in different fields. Perceiving proof of people in an association with a definitive target of intrigue is one such utilization of face assertion. Upkeep and seeing of participation records acknowledge an essential action in the evaluation of execution of any alliance. The motivation driving making collaboration the chairmen framework is to mechanize the standard procedure for estimating support. Robotized Attendance Management System plays out the reliably exercises of venture checking and evaluation with reduced human mediation. The predominant structures and strategies for thinking for perceiving and seeing face dismissal to beat issues, for example, scaling, present, light, groupings, pivot, and impediments. The proposed framework plans to conquer the snares of the present structures and gives highlights, for example, ID of faces, extraction of the highlights, affirmation of disconnected highlights, and evaluation of understudies' speculation. The structure wires approach, for example, picture

contrasts, basic pictures, covering highlights and falling classifier for consolidate territory. The framework gives an all-encompassing exactness because of use of an enormous number of highlights (Shape, Color, LBP, wavelet, Auto-Correlation) of the face. Appearances are seen utilizing Euclidean division and k-closest neighbor figuring's. Better exactness is developed in results as the framework considers the developments that happen in the face over the time apportioning and uses fitting learning estimations. The structure is pursued for different use cases. We consider a particular zone, for example, homeroom backing to test the accuracy of the framework. The estimation considered is the level of the evident faces per rigid number of endeavored appearances of a near individual. The structure is endeavored under fluctuating lighting conditions, different outward appearances, closeness of halfway faces (in thickly populated examination halls) and nearness or nonappearance of facial hair and grandstands. An all-inclusive precision (about 100%) is acquired in the greater part of the cases considered.

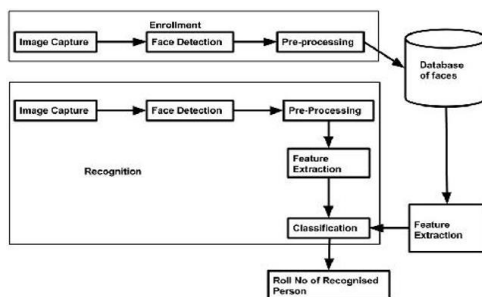
## 2. Methodology

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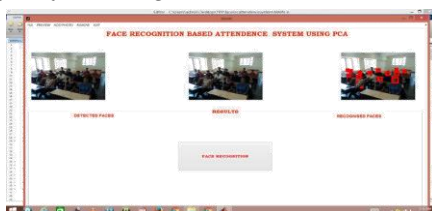
### 3. Image capturing process



#### A. Face detection

The main Viola and Jones method proposed for face detection executes at 15 frames. However, over the last few years, many developers and researchers have improved the original methods so as to suit the respective real-time applications. An approach is made to decrease the computational complexity by applying the face detection algorithm only to the segmented region after background subtraction. The implementation of our face detection method is a wavelet transform based. The objects shape is represented in wavelet coefficients subsets. In order to compute the Haar features, integral images have been used. The rectangle feature values have been constructed by computing the difference in the variance of black region and white region. The technique of an integral image and squared integral image is used to calculate these features. The steps used to detect the face are depicted.

#### B. Image of the face recognition



#### C. Face recognition

At present, the faces of all members under different conditions are stored in dataset. Numpy arrays have been generated after training all these images. The trained classifier file has been saved which is helpful to label the test dataset taken from class. The input image will be the image containing all the members of a class. First, it detects all the faces using face detection algorithm. The detected faces are then converted to gray scale image. Further, the trained classifier has been utilized to recognize the face. Each recognized face will be labelled with student ID which further helps to monitor the attendance.

#### D. Database of images

In the data base of the images it stores the images of the entire class students ones it captures the images it will check in the data base whether the images are present in that database. It will check that image in all possible ways present in the database system. If that related picture is present in that, then it will show that roll number of the person. Else it will not show the roll number of that images.

### 4. Observation of result

Assessments are finished on accounts as it is difficult to consider all understudies information. It is done considering the way that the information in a singular picture isn't satisfactory since the understudies move their body parts. IT shows the results gained for a video of objectives 160x120 with a singular human face for each edge. Haar falls are outstanding for constant applications. Appearances should be evident to the run of the mill human eye to get perceived. The dataset ought to include every individual pictures in various light powers and various bearings in order to get apparent. The edge estimation of range is proposed while recognizing the face after certain examination.

Distinctive light conditions and different direction have been used to make the dataset. Six cameras have been used to cover the entire investigation corridor which gives proper objectives about each understudy. With the proposed computation.

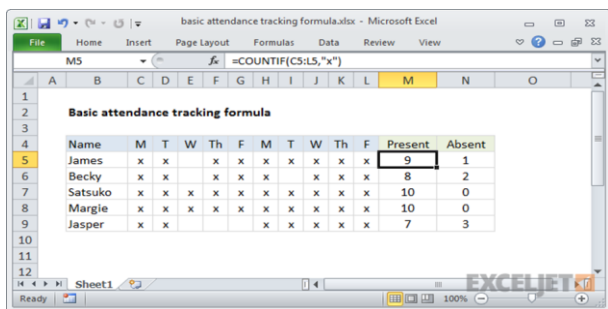
Table 1  
Statistics of the students

Test case	Image/person	Number of People	Total Images	Accuracy
Case 1	10	3	30	100%
Case 2	5	2	10	100%
Case 3	2	7	14	83%
Case 4	1	3	3	100%
Case 5	3	20	60	100%
Case 6	2	2	4	100%
Case 7	3	4	12	76%
Case 8	2	10	20	72%
Case 9	1	10	10	64%
Case	1	2	2	43%
10				

The above statistics shown the percentage of the attendance of the students by using the automatic image detector using the image processor techniques without errors.

*A. Statistics of the normal attendance of students*

The normal attendance is done by the humans with their rules, which will be changed again and the again. But in the automatic attendance system follows in built programme of the system hence it will follow the rules and regulations correctly without fail up to someone makes changes in the process of the system. hence it will be useful for the maintaining and follows the correct rules in the attendance based systems.



Name	M	T	W	Th	F	M	T	W	Th	F	Present	Absent
James	x	x		x	x	x	x	x	x	x	9	1
Becky	x	x		x	x	x	x	x	x	x	8	2
Satsuko	x	x	x	x	x	x	x	x	x	x	10	0
Margie	x	x	x	x	x	x	x	x	x	x	10	0
Jasper	x	x				x	x	x	x	x	7	3

**5. Conclusion**

There might be different sorts of lighting conditions, guest plans and situations in different study halls. The majority of these conditions have been tried on the framework and framework has demonstrated 100% exactness for the greater part of the cases. There may likewise exist understudies depicting different outward appearances, changing haircuts,

whiskers, exhibitions and so on. These cases are considered and tried to get a significant level of exactness and productivity. Along these lines, it tends to be closed from the above dialog that a solid, secure, quick and a productive framework has been created supplanting a manual and temperamental framework. This framework can be executed for better outcomes with respect to the administration of participation and leaves. The framework will spare time, lessen the measure of work the organization needs to do and will supplant the stationery material with electronic mechanical assembly and diminishes the measure of human asset required for the reason. Consequently, a framework with expected outcomes has been grown however there is still some opportunity to get better As the facts confirm that the quantity of CC recordings has been expanded, the work can be stretched out to identify the crimes in a gathering and to perceive their spots. An appropriate robotized framework to keep up the framework utilizing multi-modular methodology is extreme point of the work.

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