

# RESEARCH PAPER ON A FACE RECOGNITION ATTANDANCE SYSTEM

Ragini Shah<sup>1</sup>, Pranav Pandey<sup>2</sup>, Sonal Yadav<sup>3</sup>

<sup>1</sup> Ragini Shah, Computer Science and Engineering, ITM Gida Gorakhpur, UP, India

<sup>2</sup> Pranav Pandey, Computer Science and Engineering, ITM Gida Gorakhpur, UP, India

<sup>3</sup> Sonal Yadav, Computer Science and Engineering, ITM Gida Gorakhpur, UP, India

## ABSTRACT

The distinctiveness or personality of a person's face represents one's identity. In this project a person's face is automatically used for the purpose of making an appearance. Student attendance is very important for every college, university and school. The traditional method for taking attendance is by calling on the student's name or roll number and recording the attendance. Time consumption is an important concern for this purpose. Let's say the duration of a subject is about 60 minutes or 1 hour and it takes 5 to 10 minutes to register attendance. It is a waste of time for every teacher. To avoid these disadvantages, an automatic process is used in this project which is based on image processing. Face detection and face recognition are used in this project. Facial recognition is used to detect the position of the facial area and facial recognition is used to mark the attendance of the student. The database of all the students in the class is stored and when the individual student's face matches any one face.

**Keyword:** - Face Recognition, Face Detection.

## 1 Introduction

Scholar attendance and retention is a tedious manner inside the establishment. Each organization has allowed its very own form of presence i.E. Identification or switch of layers. Several not unusual laptop strategies currently used are RFID, IRIS, FINGERPRINT and so on. All companies want a sturdy and constant gadget to file the presence of their college students. But, setting a line is important in those situations so it requires extra time and is certainly disruptive. If there is any damage to the RFID card it is able to cause malformations. Other than this, the shipping of these applications on a massive scale is less expensive and takes a lot of time to send to attendees.

The primary use of facial recognition with attendance markers is the fastest and maximum efficient manner to manage attendance. Facial recognition is the most appropriate and immediately technique among other strategies and reduces the probabilities of getting a consultant. In this application we use the photograph to report attendees in the speech or section and to keep the attendance facts supplied by using the default attendance machine. After growing a scholar internet site, it requires almost no effort at the part of the user. Consequently, the disruptive environment isn't in this application and makes it very powerful. Face attention is critical in normal life to become aware of family, pals or someone we understand. We won't understand that some steps have been taken to reveal off our faces. Human intelligence lets in us to gain data and interpret data inside the reputation technique. We receive records via the visible representation of our eyes, through the retina inside the form of light. Light is a form of electric contemporary that emits power from an item to the object and is visible with the aid of people. The classroom normally has a large variety of college students who often take a long time to build a machine on the way to routinely detect current students and mark students effectively could be very beneficial, which includes scanning group of workers IDs however a lot easier. Face popularity is a pc program that automatically detects or authenticates a person with a virtual photograph or video frame from a video source. One manner to do that is to computerize selected face capabilities from an photo and face mask.

Flow Chart

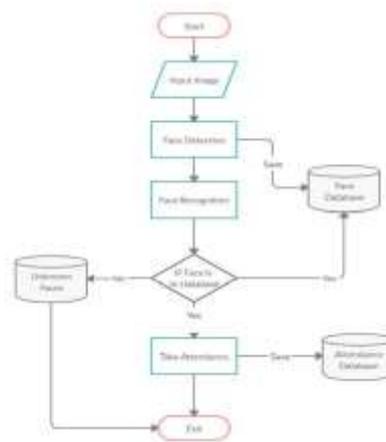


Image representation on digital computer

DAO represents the Decentralized self sustaining agency. As the name implies, the image is an An a 2-Dimensional light depth feature

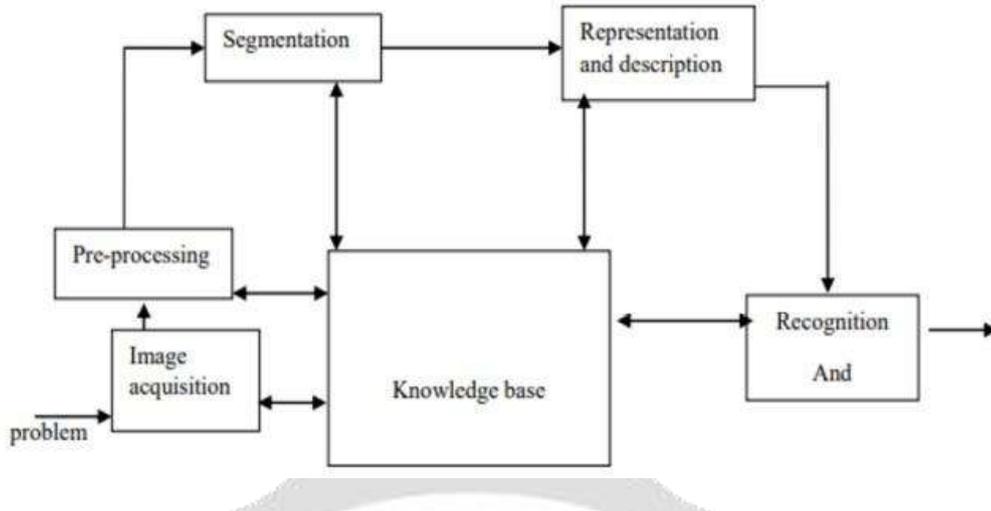
$$f(x, y) = r(x, y) \times i(x, y)$$

where,  $r(x, y)$  is the bottom view of the corresponding image point.  $(X, y)$  Represents the intensity of the incident lamp. The digital image  $f(x, y)$  is separated from both the area coordinates by grid and light by measurement. Effectively, an image may be represented as its line matrix, column indicators specify the point between the image and the number of details indicating the cost of the gray stage thus. These elements are called pixels or pels. Generally following image processing packages, the image length used is  $256 \times 256$ , factor,  $640 \times 480$  pels or  $21$  pixels or  $2$  Estimating the number of these matrix pixels is done in 8 bits -snap shots in black and white and 24 bits in fast-paced color images (due to the three-color, green planes each eight bits).

#### ➤ Visual image processing steps

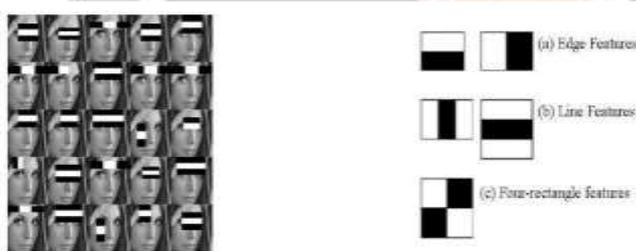
Visual image processing involves the following key functions:

- Image acquisition - The imagination sensor and the ability to digitally signal is generated using a sensor.
- Pre-processing - completes a beautiful, refined image, enhanced exploration and more.
- Isegmentation - breaks the image into parts of gadgets.
- Description / job selection - renders a picture of the appropriate image elements beyond the computer processing.
- Dignity and interpretation - Giving a label on an object based on facts provided with the help of its definition. Translation assigns what you mean to fixed labels.
- Knowledge base - This allows for green processing beyond the integration of intermediate modules.



**.2 Viola-Jones Algorithm**

Viola-Jones algorithm which was introduced by P. Viola, M. J. Jones (2001) is the most popular algorithm to localize the face segment from static images or video frames. Basically the concept of Viola-Jones algorithm consists of four parts. The first part is known as Haar feature, second part is where integral image is created, followed by implementation of Adaboost on the third part and lastly the cascading process.



Viola-Jones algorithm analyses a given image using Haar features consisting of multiple rectangles (Mekha Joseph et al., 2016). The fig shows several types of Haar features. The features perform as window function mapping onto the image. A single value result, which represents each feature, can be computed by subtracting the sum of the white rectangle(s) from the sum of the black rectangle(s) (Mekha Joseph et al., 2016).

Original	Integral	Original	Integral
5 2 3 4 1	5 7 10 14 15	5 2 3 4 1	5 7 10 14 15
1 5 4 2 3	6 13 20 26 30	1 5 4 2 3	6 13 20 26 30
2 2 1 3 4	8 17 25 34 42	2 2 1 3 4	8 17 25 34 42
3 5 6 4 5	11 25 39 52 65	3 5 6 4 5	11 25 39 52 65
4 1 3 2 6	15 30 47 62 81	4 1 3 2 6	15 30 47 62 81

$5 + 2 + 3 + 1 + 5 + 4 = 20$	$5 + 4 + 2 + 2 + 1 + 3 = 17$	$34 - 14 - 8 + 5 = 17$
------------------------------	------------------------------	------------------------

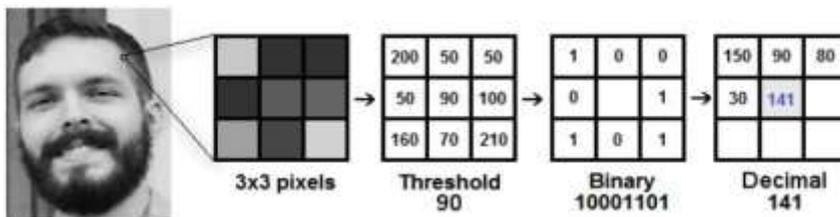
The value of integrating an image in a specific location is the sum of pixels on the left and the top of the respective location. In order to illustrate clearly, the value of the integral image at location 1 is the sum of the

pixels in rectangle A. The values of integral image at the rest of the locations are cumulative. For instance, the value at location 2 is summation of A and B, (A + B), at location 3 is summation of A and C, (A + C), and at location 4 is summation of all the regions, (A + B + C + D) [11]. Therefore, the sum within the D region can be computed with only addition and subtraction of diagonal at location 4 + 1 - (2 + 3) to eliminate rectangles A, B and C.

**Local Binary Patterns Histogram**

Local Binary Pattern (LBP) is a simple yet very efficient texture operator which labels the pixels of an image by thresholding the neighborhood of each pixel and considers the result as a binary number. It was first described in 1994 (LBP) and has since been found to be a powerful feature for texture classification. It has further been determined that when LBP is combined with histograms of oriented gradients (HOG) descriptors, it improves the detection performance considerably on some datasets. Using the LBP combined with histograms we can represent the face images with a simple data vector.

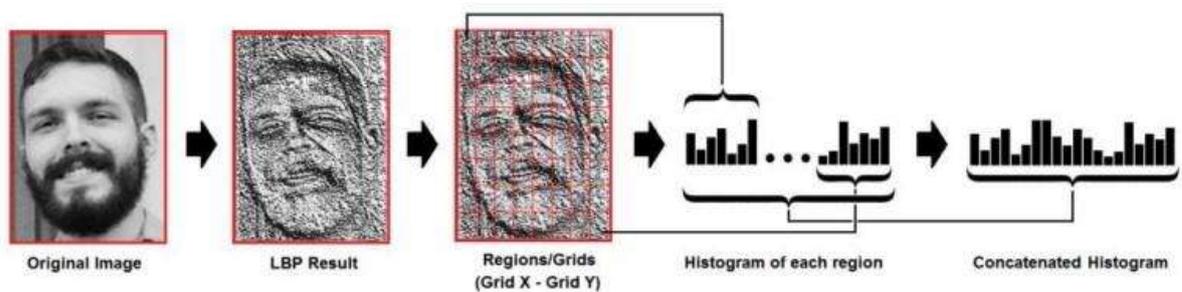
The image below shows this procedure:



**Extracting the Histograms:**

Now, using the image generated in the last step, we can use the Grid X and Grid Y parameters to divide the image into multiple grids, Based on the image above, we can extract the histogram of each region as follows:

- As we have an image in grayscale, each histogram (from each grid) will contain only 256 positions (0~255) representing the occurrences of each pixel intensity.
- Then, we need to concatenate each histogram to create a new and bigger histogram. Supposing we have 8x8 grids, we will have 8x8x256=16.384 positions in the final histogram. The final histogram represents the characteristics of the original image.



**Conclusion**

In this program we have used a curriculum visit or where a teacher or assistant facilitator can record student attendance. Save time and effort, especially if it is a talk with a large number of students.

face recognition technology is generally associated with less expensive and secure applications. Today the basic technology has evolved and the cost of equipment has dropped dramatically due to its integration with increasing process power. Some face recognition applications are now more expensive, more reliable and more accurate. REFERENCES

[1] Dr. Shrija Madhu , Ms. Anusha Adapa, Ms. Visrutha Vatsavaya, Ms. Padmini Pothula “FACE RECOGNITION BASED ATTENDANCE SYSTEM USING MACHINE LEARNING”, in *International Journal of Management and Engineering*, Volume IX, March/2019

[2] Dr.R.SSabeenian, S.Arvind, P.Arunkumar, P. Harrish Joshua” *Smart Attendance System Using Face Recognition” in Journal of advance in Dynamical and Control System*, May 2020

[3] Dulayawit Prang Chumpol“ *Face Recognition for Attendance Management Using Multiple sensors*, CGDIP 2019

[4] Amritha , Sudhakar “*Face Recognition based Attendance System Using Machine Learning” IJERD 2019, Vol.7,Issue 3*

[5] Alankar Patil, Priya K. P, Prajwal More, Aniruddh Joshi, A.R. Kamble “*Attendance Monitoring using Face Recognition and Machine Learning” , International Journal of Future Generation Communication and Networking, Vol. 13, No. 3s, 2020*

[6] Sireesha Chintalapati “*automated attendance system based on face recognition system”Department of ece 2013*

[7] Samuel lukas “*student attendance system in classroom using face recognition technique” University of pelitaharapan ,Indonesia 2017*

[8] Shubhobrata Bhattacharya “*Smart attendance monitoring system” Indian institute of technology 2018*

[9] Ghalib al-muhairi , Javeed Hussain, “*Smart attendance system using face recognition” IJERT, Vol 8, Issue 12, December 2019, Muscat oman*

[10] Relly victoriavirgil “*face recognition as a biometric application”, Journal of Mechatronics and Robotics, 2019 Relly Victoria Virgil Petrescu*

[11] Divya Pandey, Priyanka Pitale, “*face recognition based attendance system using Python” JETIR October 2020, Volume 7, Issue 10*

[12] Amritha Sudhakar “*face recognition based attendance system using ml” IJERDE 2019 | Volume 7|, Issues 3*

[13]Shireesha Chintalapati, M.V. Raghunadh,Automated attendance Management system based on Face recognition algorithm, IEEE, International Conference on Computational Intelligence and Computing Research, 2013

[14] Samul Lukass, Aditya Rama Mitra, Desanti, Dion Krisnadi,Student Attendance System in classroom Using Face Recognition Techniques, Karawaci, Indonesia.

[15] Ajinkya Patil, Mrudang Shukla, Implementation of Classroom Attendance System Based on Face Recognition In Class, *International Journal Of Advance in engineering & Technology*, July, 2014

[16] Abhishek Jha, Classroom Attendance System using Facial Recognition System, *The International Journal of mathematics, Science, Technology and Management (ISSN: 2319-8125) Vol. 2 Issue 3*

[17] Shubhobrata Bhattacharya, Gowtham Sandeep Nainala, Smart attendance Monitoring System (SAMS): A facial recognition based attendance system for classroom environment, 2018, IEEE 18<sup>th</sup> International Conference on Advanced learning Technologies

[18] Rohit Haldar, Rajdeep Chatterjee, Deep Learning based Smart attendance system, School of Computer Engineering, KIIT Deemed to be University

[19] Xiong Wei, Anupam Manori, QR code based attendance system, International Journal of Smart business and Technology Vol. 05, No. 1,(2017)

[20] Sherimn Sultana, Asma Enayer,A Smart, Location Based Time and Attendance tracking system using android application. IJCSEIT, Vol. 5, No. 1, February 2015

[21] Ekansh Gupta, Nidhi Singh, Mansi Saxena,Smart attendance monitoring and counting, IRJET, Volume: 05 Issue: 02|Feb 2018

[22]Hayder Fadhil Adbulsada,Design and Implementation of smart attendance based on Raspberry pi, Journal of Babylon University/No.(5)/Vol.(25).2017

