

# Automated Human Resource and Attendance Management System Based On Real Time Face Recognition

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## ABSTRACT

Automatic face recognition (AFR) innovations have seen sensational enhancements in execution over the previous years, and such systems are presently generally utilized for security and business applications. A system for human face recognition for an association to stamp the attendance of the employees is been executed. So Smart Attendance utilizing Real Time Face Recognition is a genuine arrangement which accompanies everyday exercises of dealing with employees. The errand is exceptionally troublesome as the ongoing foundation subtraction in a picture is as yet a test. To identify ongoing human face are utilized and a basic quick Principal Component Analysis has used to perceive the faces identified with a high exactness rate. The coordinated face is utilized to stamp attendance of the representative. Our system keeps up the attendance records of employees consequently.

**Keywords:** Real Time Face Recognition, Smart Attendance, HRMS, Bio-Metric Attendance System

## I. INTRODUCTION

Maintaining the attendance is imperative in every one of the organizations for checking the execution of employees (4). Each establishment has its own particular strategy in such manner. Some are taking attendance physically utilizing the old paper or record based approach and some have embraced strategies for programmed attendance utilizing some biometric procedures. Yet, in these strategies employees need to sit tight for long time in influencing a line at time they to enter the workplace. Numerous biometric systems are accessible however the key confirmations are same is every one of the strategies. Each biometric system comprises of enrolment process in which exceptional highlights of a man is put away in the database and afterward there are procedures of distinguishing proof and check. These two procedures

think about the biometric highlight of a man with beforehand put away layout caught at the season of enlistment. Biometric formats can be of numerous sorts like Fingerprints, Eye Iris, Face, Hand Geometry, Signature, Gait and voice. Our system utilizes the face recognition approach for the programmed attendance of employees in the workplace room condition without employees' intercession.

The Proposed application programming can oversee representative data via robotizing the center human asset capacities which is essentially in light of worker data, advantages and finance forms. It has elements of worker administration that expansion proficiency and efficiency of human asset office and will diminish the time utilization taken between forms by convenient creating the vital reports and insights. What's more,

the system will diminish repetitive information and mistake scope by effortlessly making exact detailing.

It contains a natural UI that gives speedy access to data. Complex, multi-level security alternatives controls the getting to or review of data put away in the system. An incorporated database contains all the present and memorable data about the dynamic and non-dynamic employees of the association.

Besides, the system will increment simple maintenance of information by giving an abnormal state of administrations to the employees. By and large, the system will decrease routine organization and advance a paperless situation.

The First is Face Detection; this system incorporates recognition of human face through a top notch camera where location of pictures is finished utilizing an outstanding calculation called Viola Jones Algorithm for face identification. This calculation helps in dispensing with the issues of scaling, enlightenment and pivot separately. Face identification utilizing Viola Jones calculation fundamentally incorporates Haar highlights, Integral Image, Adaboost and Cascading. Haar highlights are utilized to identify the nearness of specific element in the given picture. The indispensable pictures chooses any pixel ascertains the pixel esteems utilizing every one of the pixels on the left and best of the chose pixel. On the off chance that we consider every conceivable parameter of the haar highlights like position, scale and sort we wind up computing around 160,000+ highlights. Consequently, the AdaBoost part is utilized which encourages us in recognizing just the required examples those are all that could possibly be needed for highlight recognition and in this way, making numerous examples repetitive. The single component in the picture is called powerless classifiers and when they are aggregate up they frame a gathering of

highlights called solid classifiers. Summing of every one of these highlights is finished by Cascading. When we are finished with identification we move to face recognition part.

The second one is Face Recognition, this system utilizes nearby double example (LBP) for face recognition. The info picture comprises of various pixels. A 3x3 lattice is made keeping the chose pixel in the inside and having 9 pixels in the whole network, the first LBP administrator names the pixels of a picture by Thresholding a 3x3 neighbourhoods of every pixel with the middle esteem and considering the outcomes as a parallel number, of which the relating decimal number is utilized for naming If the incentive with which it is being analyzed is more prominent, at that point the position of the pixel is set apart as 1; else it is taken to be 0. The correlation is begun from the pixel at the left best most position of the 3x3 framework. Along these lines by utilizing this system, all the pixel positions are set apart as either 0 or 1 and a double framework is gotten. This parallel network is on the other hand changed over into decimal lattice and spoke to as a 3x3 framework separately. Presently the decimal esteem is acquired for every pixel and a histogram is created. This histogram is novel for each individual picture and aides in characterizing and perceiving the individual precisely. Along these lines, utilizing this system, every one of the pictures are distinguished amid the face recognition stage individually. For Implementing a Face Detection and Recognition we are utilizing Luxand Face SDK.

## II. Related Work

### A. OpenCV

OpenCV (Open Source Computer Vision) is a library of programming capacities principally went for continuous PC vision.[6] Originally created by Intel's

examination focus in Nizhny Novgorod (Russia), it was later upheld by Willow Garage and is presently kept up by Itseez.[5] The library is cross-stage and free for use under the open-source BSD permit.

The principle supporters of the task incorporated various advancement specialists in Intel Russia, and also Intel's Performance Library Team. In the beginning of OpenCV, the objectives of the undertaking were portrayed [7] as:

- Advance vision inquire about by giving open as well as improved code for essential vision framework. No additionally re-examining the wheel.
- Disseminate vision information by giving a typical framework that designers could expand on, with the goal that code would be all the more promptly discernable and transferable.
- Advance vision-based business applications by making convenient, execution streamlined code accessible for nothing—with a permit that did not expect code to be open or free itself.

The principal alpha rendition of OpenCV was discharged to people in general at the IEEE Conference on Computer Vision and Pattern Recognition in 2000, and five betas were discharged in the vicinity of 2001 and 2005. The initial 1.0 form was discharged in 2006. In mid-2008, OpenCV acquired corporate help from Willow Garage, and is presently again under dynamic improvement. A rendition 1.1 "pre-discharge" was discharged in October 2008.

The second significant arrival of the OpenCV was in October 2009. OpenCV 2 incorporates significant changes to the C++ interface, going for less demanding, more compose safe examples, new capacities, and better usage for existing ones as far as execution (particularly on multi-center systems). Official

discharges now happen like clockwork [8] and advancement is currently done by a free Russian group bolstered by business organizations. In August 2012, bolster for OpenCV was assumed control by a non-benefit establishment OpenCV.org, which keeps up an engineer [9] and client site. [10]

## B. DeepFace

DeepFace is a profound learning facial recognition system made by an exploration amass at Facebook. It recognizes human faces in advanced pictures. It utilizes a nine-layer neural net with more than 120 million association weights, and was prepared on four million pictures transferred by Facebook users.[11][12] The system is said to be 97% exact, contrasted with 85% for the FBI's Next Generation Identification system.[13] One of the makers of the product, Yaniv Taigman, came to Facebook by means of their 2007 securing of Face.com.[14]

## C. Visage SDK

Appearance SDK is a multiplatform programming improvement unit (SDK) made by Visage Technologies AB. Appearance SDK enables programming software engineers to manufacture a wide assortment of face and head following and eye following applications for different working systems, versatile and tablet conditions, and implanted systems, utilizing PC vision and machine learning calculations.

## D. digiKam

digiKam is a free and open-source picture coordinator and label supervisor written in C++ using the KDE Platform [15]. digiKam keeps running on most known work area situations and window supervisors, as long as the required libraries are introduced. It bolsters all real picture document groups, for example, JPEG and PNG and additionally more than 200 RAW record formats[16] and can sort out accumulations of photos in catalog based collections, or dynamic collections by date, course of events, or by labels. Clients can

likewise add inscriptions and appraisals to their pictures, look through them and spare scans for later utilize. Utilizing modules, clients can trade collections to different online administrations including (among others) 23hq, Facebook, Flickr, Gallery2, Google Earth's KML records, Yandex.Fotki, MediaWiki, Rajce, SmugMug, Piwigo, Simpleviewer, Picasa Web Albums. Modules is additionally accessible to empower copying photographs to a CD and the production of web exhibitions. digiKam gives capacities to sorting out, reviewing, downloading as well as erasing pictures from computerized cameras. Essential auto-changes can likewise be sent on the fly amid picture downloading. Likewise, digiKam offers picture improvement devices through its KIPI (KDE Image Plugins Interface) structure and its own modules, similar to red-eye evacuation, shading administration, picture channels, or enhancements. digiKam is the main free photograph administration application on Linux that can deal with 16 bit/channel pictures. Computerized Asset Management is the pillar of digiKam.

### III. Literature Survey

Vigorous Real-Time Face Detection was proposed by Paul Viola and Michael J. Jones [1]. Systems based on their proposition were helpful just when utilized under different requirements. These requirements included unique parameters that couldn't be controlled on occasion, for example, variety in the stance of the individual, change in the radiance of the encompassing, and so on. Henceforth, the systems were named to be wasteful when not used under the required imperatives.

Constant Human Face location and Tracking was proposed by J. Chatrath, P. Gupta, P. Ahuja, A. Goel[2]. Their paper portrays the strategy of ongoing profile discovery and recognition by adjusting Viola-

Jones calculation [1]. Results accomplished by the created calculation demonstrated that up to 50 human faces could be identified and followed by systems utilizing the changed calculation. Preparing of information and time utilization is similarly less in such systems.

Usage of Attendance Management System was proposed by G. Lakshmi Priya [1] and M. Pandimadevi. Systems worked around this proposition would catch a picture utilizing a web camera at unique occasions. A precision of 68% was seen in such systems individually.

Cheng, et al. [3] built up the system to deal with the setting of the understudies for the classroom address by utilizing note PCs for every one of the understudies. Since this system utilizes the note PC of every understudy, the attendance and the position of the understudies are gotten. Be that as it may, it is hard to know the point by point circumstance of the address. Our system takes pictures of faces. In late decade, various calculations for face recognition have been proposed [4], however the greater part of these works manage just single picture of a face at any given moment. By constantly seeing of face data, our approach can take care of the issue of the face identification, and enhance the precision of face recognition.

### IV. Implementation Methodology

The system comprises of a Registration procedure where representative needs to enlist. Enrollment frame comprises of the Basic Details area where worker fills the fundamental points of interest like Name, Last Name, and Date of Birth and so on. Next segment comprises of Academic points of interest and Details identified with joining and assignment. In the last segment the face recognition and picture catch

module works where client needs to filter the face or catches the photograph with the appended camera. Camera catches the pictures of the worker and sends it to the database for additionally handling.

apart on the server from where anybody can access and utilize it for various purposes.

## V. Pseudo Code of Proposed System

Following are the steps for the propose system.

Input: User Data & Live Image from Camera

Output: Employee Registration & Attendance

Steps:

1. Capture the Employees Image
2. Apply Luxand Face SDK (Face Detection)
3. Identify the Gender
4. Extract the ROI in Rectangular Bounding Box
5. Convert to gray scale,
6. Equalization and Resize to 100x100
7. Updating Database then Store in Database

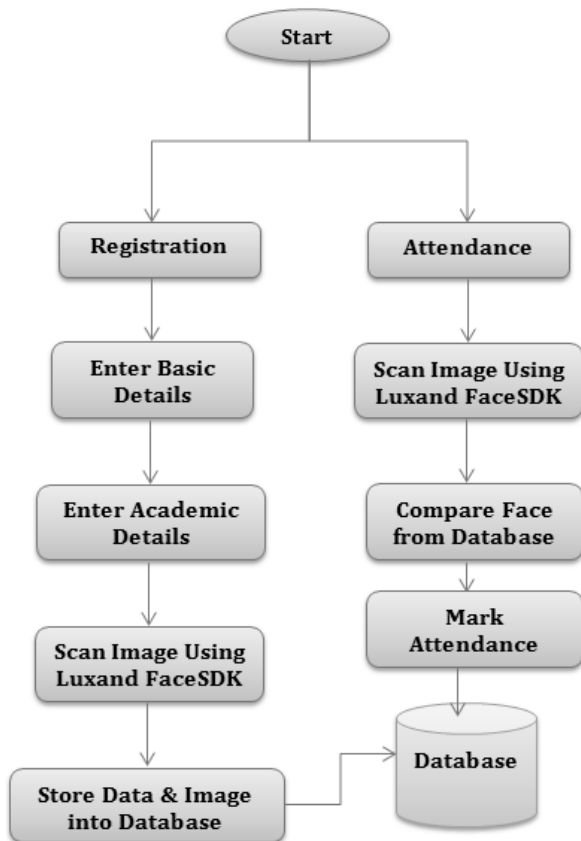


Figure. 1 System Flowchart

In the Attendance module representative again need to catch the picture with the assistance of joined camera. Picture comes in the Face Detection and Recognition modules of Luxand FaceSDK, which recognizes the face and afterward the attendance is set apart on the database server. This is appeared in the exploratory setup in Figure (1). At the season of enrolment, layouts of face pictures of individual employees are put away in the Face database. Here every one of the faces are recognized from the information picture and the calculation contrasts them one by one and the face database. On the off chance that any face is perceived the attendance is set

## VI. Conclusions And Future Work

The improvement of any association depends profoundly on the viable attendance administration of its employees. Mechanized Attendance Systems in light of face recognition strategies subsequently turned out to be efficient and secured. Distinctive strategies are been connected for dealing with the attendance of employees however they have been found not to take care of the issue of representative attendance. These issues can be unravel by utilizing biometric confirmation innovation utilizing face recognition since a man's biometric information is verifiably associated with its proprietor, is non-transferable and exceptional for each person. The system has been incorporated utilizing face recognition innovation that will proficiently empower associations deal with the attendance of their employees which will extraordinarily enhance the advance of associations.

The future work is to enhance the recognition rate of calculations when there are unexpected changes in a

man like tonsuring head, utilizing scarf, whiskers. The system grew just perceives face upto 30 degrees edge varieties which must be enhanced further. Step recognition can be melded with face recognition systems keeping in mind the end goal to accomplish better execution of the system.

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