



e-ISSN: 2278-8875

p-ISSN: 2320-3765

International Journal of Advanced Research

in Electrical, Electronics and Instrumentation Engineering

Volume 9, Issue 12, December 2020

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 7.122

9940 572 462

6381 907 438

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Face Detection for Identification Management System Using Artificial Intelligence

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ABSTRACT: Identification is an important key to analyze individual performance. In this technical world we are mainly opting an automated process rather than a manual identification as it is considered as a time-consuming job and a chance of human error too. Biometric is one of the processes. To be automated the main objective is to identify the person through his facial features. Later this feature is compared with database and accordingly attendance is marked. Face recognition is an important aspect it's a person identification system to analyze its characteristics. Traditional system has some drawbacks like the output is not accurate and difficult to build a record. This project aim is to deviate from such traditional system and adopt a new technology to identify employee using face recognition.

KEYWORDS: Face detection, Identification management system, Artificial intelligence.

I. INTRODUCTION

Making attendance system automated with Artificial Intelligence using a machine, defines an intelligent envoy which recognizes the environment by performing actions and accomplish its goal. This project is under the domain of Artificial Intelligence, mainly with security sector. Making us to grow with an AI based application that solely identifies a person evaluating pattern based on facial features. Now everything is turning automated using machines as an alternative for pen and paper. That too in this pandemic condition where social distancing need to strictly follow and not to touch, this project will definitely resolve all the issues by directly recognizing the person as he/ she enter the room and marking his/her attendance while following all norms along with overcoming drawbacks as facial features like beard growth, identifying person from certain angle.

Traditional method like using finger prints, face detection etc, it's all deplete time as people need to wait in queue for their chance, to touch their thumb in the biometric machine. While, in this project without human intervention we mark employee's attendance. Camera is installed at the entrance door which will continuously captures the images, analyze faces in the images and compare with the data feed in database. This project also correlates work in the area of Identification system describing system design, software algorithm and outcomes.

II. LITERATURE SURVEY

Over the last decades face recognition has been an active research area. Face recognition is a crucial utility of image processing owing to its various applications in many fields. To implement this system various sub methods like Machine learning approach, Image processing, Pattern recognition etc. The process includes identify the image individually and then classify the new out coming test cases.

To evaluate the performance of those employees working within the organization, face recognition has become an invaluable part of Identification system. Biometric technologies are pertained in many fields but not yet conveyed assure of guaranteeing automated human recognition. Face recognition is premeditated to be one of the most well-to-do applications of image processing and analysis. Due to which this field has gain much attention in the past several years.

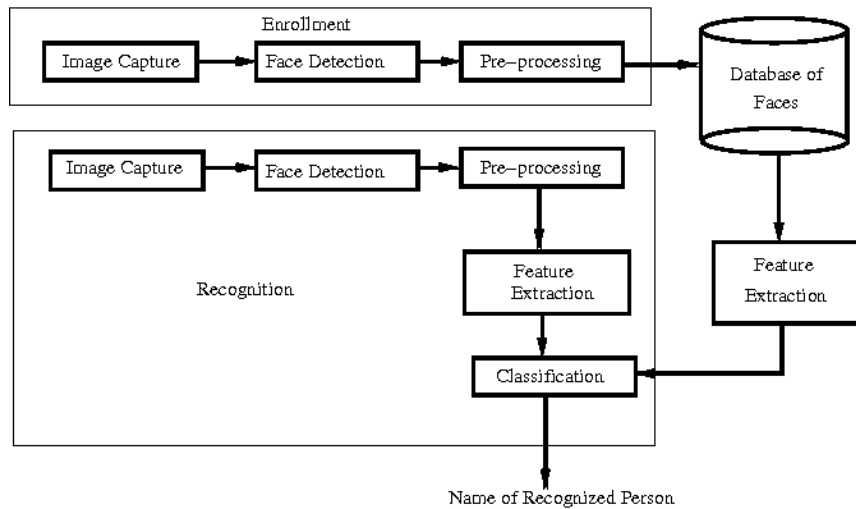


Fig. 1: Flow chart

Face plays an important role for recognizing an individual and this becomes the input for the project to go ahead. One way is comparing selected features from the image, and identifying from facial database. Identification is done by comparing this data with the database. Extraction of this special feature like face pattern, its size, iris, etc can be done using some algorithm. Facial recognition process can be divided into two main processes:

- i. Face detection and alignment takes place (localization and normalization).
- ii. Recognition takes place through a feature extraction, and matching steps.

III. PROBLEM DEFINITION

Maintaining attendance record for enormous number is a tedious process and takes a lot of exertion and time. As it is a manually done the data is subjected to get damage/ loss. This procedure can be easy and productive within less period of time, but on the other hand handling this huge record includes number of employees, there in time, out time etc. often leads to human error.

Now-a-days many organizations opting for Biometric system, still result with certain drawbacks like the system accepts an unauthorized person or when authorized person is rejected i.e. rate of error. Biometric identification system is time consuming as it takes much time to mark the identification and cause a long queue of employees in the morning and in the evening. Infection Carrier, there is high risk of spreading infection as everyone shares germs on biometric identification management system. Environmental Challenges: under extreme cold or extreme heat, the error rate is also very high. Thus, this raises a challenge for using biometric identification system that can be overcome through this project.

IV. METHODOLOGY

A. Functional Specifications:

Function specifications are unit which requires various requirements to operate a system. These necessities vicinity unit important to bring together a system that's capable to attain the objectives.

- o First taking pictures the facial photograph through excessive quality digital camera.
- o HD digital camera in particular skilled digital camera.
- o Facial expression must be detected in photo.
- o Crop the general stages of faces detected.
- o Length all images till the recognition system takes picture to acknowledge.
- o Calculative the general institution motion proportion supported countenance matched.
- o Storing all of the detected face pictures in an extremely folder.
- o Loading the pictures into the database.
- o We want to train countenance to laptop to well known.
- o Perform popularity for faces maintain on data.
- o Calculate laptop facial recognition velocity for effective security.



- o Appearing arts face recognition consecutive for the each image cropped.
- o Displaying input and output cropped photograph side by using facet on a identical slot to renowned and examine the options with the aid of machine.
- o While recognizing the face displays the name of the output photo on top of the picture inside the given space to spot really.

B. Non-Functional Specifications:

Non-functional Specifications are the needs based totally on the precise criteria to assess the operation of the system. Those requirements are collected and analyzed based totally on the client demands and exceptions, protection and operating and so on implementation issues.

- o The first and vital element is consumer want to find easy to take pictures.
- o The device may be easily established.
- o The operator will provide a clear practice on how to pose the face to teach computer.
- o The face reconization system should be highly secure.
- o The reaction time if the system could be very much less.
- o The face recognition gadget need to be rapid, reliable and 100% efficient.

From the above use-case stated Face detector detects the face inputted in the given image or video and loads the image to the system. Face localization can be aware anyplace face is located in the inputted photo or video marked using bounding boxes. The landmarks of the faces like eyes, shade, nostril, mouth etc are executed for function extraction from the system using face localization. The key functions are extracted the usage of face extraction to undergo tracking correctly. Facial functions are matched and classify with the databases saved. Face detection offers outputs either a nice output or bad output for the supported pictures from the set of stored database collections of picture

C. Working of face recognition system

The operating of face recognition system mainly classified into two types of algorithms. They holistic matching algorithm and featured based algorithm. The complete face is considered as enter statistics to become aware of a specific person from the database in the holistic matching technique and the face is divided primarily based on the facial features like eyes, coloration, skin tone and eyebrows etc in characteristic-primarily based method. Other than the above, in current days 3 dimensions face recognition approach is used to seize the 3D faces the use of sensor to pick out individual in actual world very appropriately. real-time face detection the use of 3D sensor based packages decided a with numerous facial photographs in special angles, on special mild special mild situation and various poses with exclusive expression makes more efficient in all applications.

Algorithm for face recognition:

Steps Used in PCA Algorithm

Step1: Preparing set of 'N' number of pictures at the initial stage.

Step2: Calculation of the eigenface from the "N" preparing set photos preserving just couple of M photos that is relate to that of the maximum highest eigen values. The "M" pics imply the "face area". At the point when new faces experienced, the "eigenfaces" can be recalculated in like way

Step3: The touching on distribution of the "M" dimensional weight area for every recognized employee is calculated via representing their unique face pix onto "face space".

Step 4 Compute set of the weights waiting for the records image or information image to M "eigen faces".

Step5: Determine if the given photo is face photograph or no longer with the aid of checking to the closeness of given picture or photo to "face space".

Step 6: If the photograph is adequately close, at that point symbolize the burden design as either an unknown or as an acknowledged individual in view of measured Euclidean separation.

Step7: If the picture is adequately sufficiently near at that point discuss with the popularity is powerful and provide appropriate records approximately recognized face from the database which maintain records of faces.

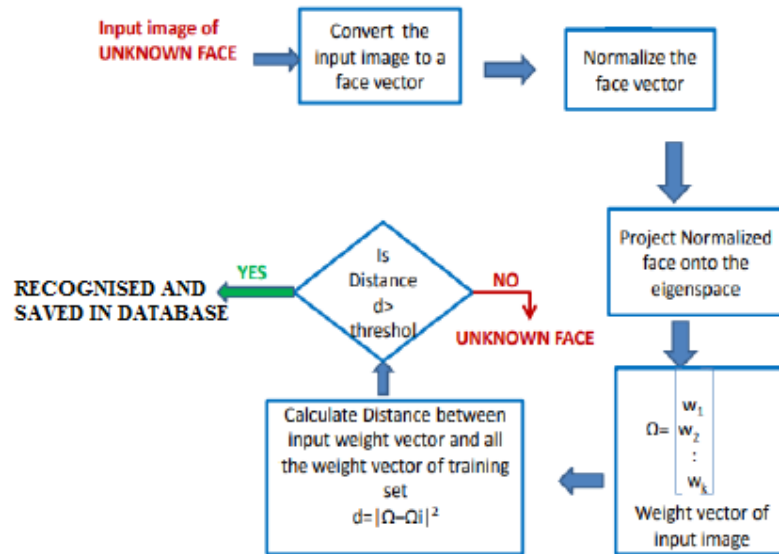


Fig. 2: Flow chart of the algorithm

ARTIFICIAL INTELLIGENCE TO MARK ATTENDENCE:

Artificial Intelligence enabled Face detection based totally application turning into international well-known. The safety gates of the premises opened only correct facial recognition recognizes the right character. The operating of this technique is based on scanning these method works by way of the approach of scanning the humans face and takes a look at with the statistics base and the individual want not to reveal their face to scanner it will routinely detects face and test with database if both matches the doors will open.

V.PROPOSED WORK

In this paper, the framework is instantiated by the internet utility .After it triggers then the framework starts processing the picture for which we need to test the identification. In image capturing stage the photo of employee is captured once it crosses the entrance. This acts as an essential stage for framework. The capture a picture which is preminent checked for certain requirements like separating, lightning, thickness, and facial expressions. The captured picture is foremost for our requirements. When it is resolute, we ensure it is either in png or jpeg design else it is changed over. Various frontal stances are taken with the goal that the precision can be accomplished to the greatest extent. This is the training database in which each employee has been ordered in view of names. For the captured image, from an each object we recognize a just frontal face which identifies simply the frontal face posture of an absolutely everyone from the captured photograph. This identifies just faces and eliminates each particular part due to the fact we are investigating the skills of simply faces. Those identified faces are positioned away in the test database for in addition enquiry. Features are extricated in this extraction level. The identified bounding boxes are additionally puzzled to look for function extraction and the eliminated capabilities are saved in matrix.

Within the actual time object is detected and feature extraction will be completed with the aid of the use of various algorithm. For every identified level this feature extraction is completed. Features we look right here are form, side skin shade and face geometry. Face is perceived as soon as we completed extracting functions. The feature that is as of now prepared with each person is compared and the identified faces encompass moreover, if the two capabilities matched then it is recognized.

As soon as the employee face is acknowledged, send the end result to database making the outcomes accessible to the Identification Management System. Basically, both recognition system and Identification Management System is connected to same database. For constructing the management system standalone software program is used to keep records of the data.

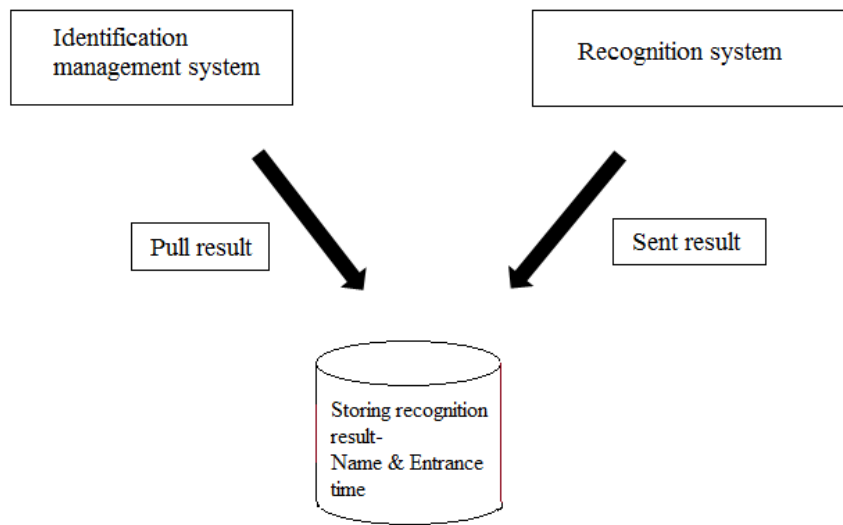


Fig.3: Exchanging data from database

VI.ADVANTAGES

1. Improvement of Security Level

Security is most critical element for every agency. They also want to screen the personnel and industrial entry into that location. Employees that are entering the enterprise premises without right access they are capturing inside security surveillance system and notice to the respective person and signals instantly regarding the person who doesn't have permission.

2. Straightforward Integration method

The automatic face detection gear works successfully with the current authentication code that organization has developed. Essentially the method is an honest to code the device to access organizations computerized records processing which makes the method very clean.

3. High Accuracy Rates

The main advantage is its accuracy. The system checks and gives the output without any false impression and bad face detection. The authorized individual will be detected at the proper time because of the excessive accuracy stages. The manual popularity, which is accomplished by securities out of doors of the company premises we may additionally use the face popularity generation to automate the technique of identity and assures its perfection without adjustments. We don't need addition worker to display the working of cameras 24/7. The principle goal of automation means to reduce human effect and reducing the price of personnel too. Then any organization can acknowledges the truth that usage of automatic face identity is fairly secure with accurate records.

4. Forget the Time Fraud

The large benefit using automatic face recognition technique is to offer the time monitoring attendance system to allow avoid time fraudness among employees. It isn't always viable to any colleagues to choose their pals due to the fact everyone desires to pass the doorway gate where the face recognition digital camera catches their photo and fits with the database and avoids time fraud amongst employees. That is very beneficial for the employees who works primarily based on hourly starts off evolved take a look at within the time starts counting from that moment until a similar test-out executed which is gain to the company they want now Not to screen their people and the approach is quick because of the actual reality that staff doesn't must prove industrial identities with the aid of scanning their clever playing cards at the scanner. It's far very difficult for the business heads to reveal all of the personnel are attending or no longer. The principle trouble is time fraud some of the employees can be prevented the usage of artificial intelligence enabled face detection gadget. The large benefit using automatic face recognition technique is to offer the time monitoring attendance.

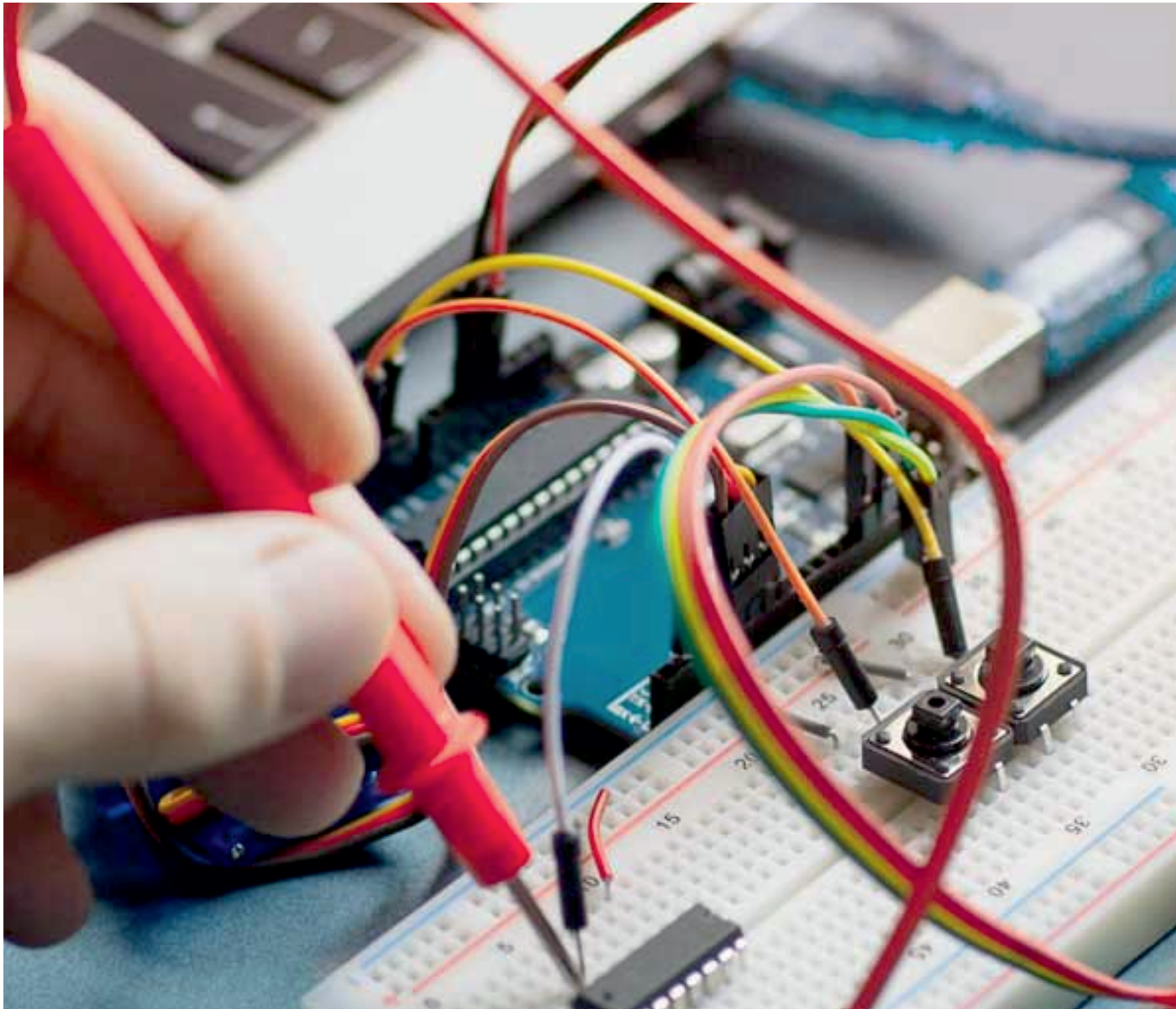


VII.RESULT

This paper is to make the attendance system automated to lower the mistakes occurs because of the manual attendance. This venture concentrates on constructing up an automatic attendance gadget. It reduces effort and time, in particular at the off hazard that it's far an address with most wide variety of employees. It's hard to pick out faces having similar facial capabilities. The framework may be reached out to react to the nearness of newcomers. It can be reached out to video surveillance to recognize fakes at large populace regions, as an instance, transport stands, theatres, railroad stations where in via face popularity strategies, the identity of the offenders can be observed.

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