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Employee Attendance Management System using Face Recognition

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Abstract— Automatic Facial Recognition Attendance System is a type of automated identification system that can recognize any person whose facial features have been saved in the database. This technology could be used by all corporations in the coming years, offices to keep track of who comes and goes. The attendance method is based on facial recognition technology. A real-time, contactless attendance tracking system that is extremely useful in today's world circumstances of a pandemic. After COVID, the work environment will not be the same. Despite the fact that the virus is still spreading, firms are attempting to restore on-premise operations in order to assure business continuity. Employees' health and safety are of utmost importance in such situations. Organizations are looking for methods to provide employees with a COVID-free workspace, and a touchless check-in is the first step. The attendance system uses a set of techniques like Haarcascade classifier and Local Binary Pattern Histogram(LBPH) Face Recognizer in deep learning to detect people in front of the camera and then changes their attendance in the attendance sheet automatically.

Keywords— Facial Recognition, Attendance, Deep Learning, Haarcascade Classifier, Local Pattern Binary Histogram(LBPH) face recognizer.

I. INTRODUCTION

Every organisation has a mandatory attendance policy. It's a difficult and time-consuming chore to keep track of employee attendance on a daily basis. Biometric, RFID, eye detection, voice recognition, and a variety of other automated approaches are all available. Face recognition provides an accurate method that solves ambiguities such as fraudulent attendance, high cost, and time consumption, as it is understood that any human's primary identity is their face.

The goal of this project is to create a facial recognition-based employee attendance management system. In the present pandemic crisis, the facial recognition attendance system is a real-time and contactless attendance tracking software that is especially significant. After COVID, the workplace will not be the same. Despite the fact that the pandemic is still spreading, firms are attempting to restore on-premise operations in order to assure business continuity. Employee health and safety are of utmost importance in such situations. Organizations are looking for methods to provide employees with a COVID-free workspace, and a touch-free check-in is the first step.

II. PROBLEM DEFINITION

A. Existing System

Every organisation has its unique method for accomplishing this. During lecture hours, some students utilise a sheet of paper and announce their names, while others employ biometrics like fingerprints, RFID card readers, and Iris systems to track attendance. Manually calling out the names of students is a time-consuming procedure. Under the RFID card system, each student is allocated a card with their linked identity, but there is a risk of card loss or illegal use of the card for fraudulent attendance. Fingerprints, iris scans, and voice recognition are examples of biometrics that have limits and are not 100 percent accurate.

B. Problems in Existing system

1) It has a lot of paperwork or specific hardware devices, which is inconvenient and time consuming.
2) The accuracy of the data collected is the most significant issue, as attendance may not be recorded personally by the original person, resulting in a third party being involved without the Organization's knowledge.

C. Proposed System

An enterprise can utilise an Automatic Attendance Management System with Face Detection in a real-time setting to see and mark the attendance of their personnel on a daily basis to keep track of their presence. The camera will capture the image, the faces will be detected, the faces will be recognised with the database, and lastly the attendance will be recorded. We create a general Deep Neural Network-Based model for automatic people detection, recognition, and updating identified faces' attendance in an Attendance sheet in this project. We used the Haarcascade classifier for face detection and the LBPH Face recognizer for face recognition to accomplish this.

D. Advantages in Proposed System

A. Real-time attendance tracking :

Easily track the attendance of a distributed workforce in real-time.

B. Error-Free and Accurate

The Facial Recognition attendance system can avoid differences like buddy punching by delivering accurate data with minimal human participation.

C. Improved Safety and Security

One of the main benefits of the Facial Recognition System is that it improves authenticity and security. When facial recognition technology is implemented throughout a company's premises, it assists in identifying allowed items and restricts access to only registered employees.

III.PROBLEM SOLUTION

The below listed are several modules, libraries and techniques that are helpful in accomplishing the goal. They are as follows:

A. Deep Learning

Deep learning methods are used to learn feature hierarchies, which are made up of features from higher levels of the hierarchy that are composed of lower level features. Deep learning algorithms try to take advantage of the unknown structure in the input distribution to find good representations, generally at several levels, with higher-level learnt features described in terms of lower-level features. The computer can learn complicated concepts by building them up from simpler ones because to the hierarchy of concepts.

To implement Deep Learning on our project we are using the following libraries in python.

1) *TensorFlow*: It is a free and open-source software library for dataflow and differentiable programming that may be used to solve a variety of problems. It's a symbolic math library that's also utilised in neural networks and other machine learning applications.
2) *Keras:* Keras includes a number of implementations of standard neural network building blocks including as layers, objectives, activation functions, optimizers, and a number of other tools to make dealing with picture and text data easier and to reduce the amount of coding required to write deep neural network code.
3) *OpenCv*: OpenCV (Open Source Computer Vision Library) is a free software library for computer vision and machine learning. More than 2500 optimised algorithms are included in the library, which contains a comprehensive mix of both classic and cutting-edge computer vision and machine learning techniques. These algorithms can be used to detect and recognise faces, identify objects, classify human actions in videos, track camera movements, track moving objects, extract 3D models of objects, produce 3D point clouds from stereo cameras, stitch images together to produce a high resolution image of an entire scene, find similar images from an image database, remove red eyes from images taken with flash, and find similar images from an image database etc.,

B. Haarcascade Classifier

Paul Viola and Michael Jones developed this method in their paper Rapid Object Detection Using a Boosted Cascade of Simple Features. Haar Cascade is a machine learning-based strategy that involves training the classifier using a large number of positive and negative images. The goal is to calculate the sum of all image pixels in the darker part of the haar feature, as well as the sum of all image pixels in the lighter portion of the haar feature.

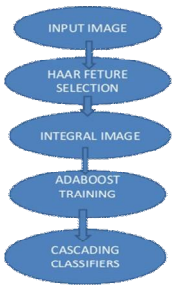

Fig. 1 Flowchart of Haarcascade classifier

C. LBPH Face Rcognizer

Local Binary Pattern (LBP) is a basic yet effective texture operator that labels pixels in an image by thresholding each pixel's neighbourhood and treating the result as a binary number. It was first described in 1994 (LBP) and has since been discovered to be a useful texture categorization trait. On some datasets, it has also been discovered that combining LBP with the histograms of oriented gradients (HOG) descriptor boosts detection performance significantly. We can represent the facial photos with a simple data vector using the LBP and histograms. It uses four parameters like Radius, Neighbours, Grid X and Grid Y.

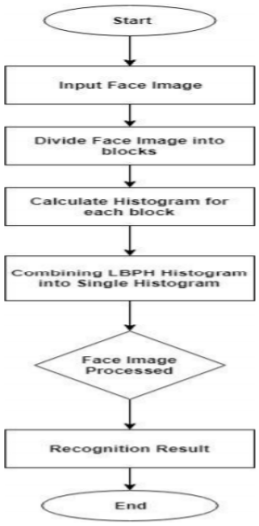

Fig. 2 Flow chart for LBPH face recognizer

IV. METHODOLOGY

The methodology of the project is shown with help of flowchart as shown in Fig 3.

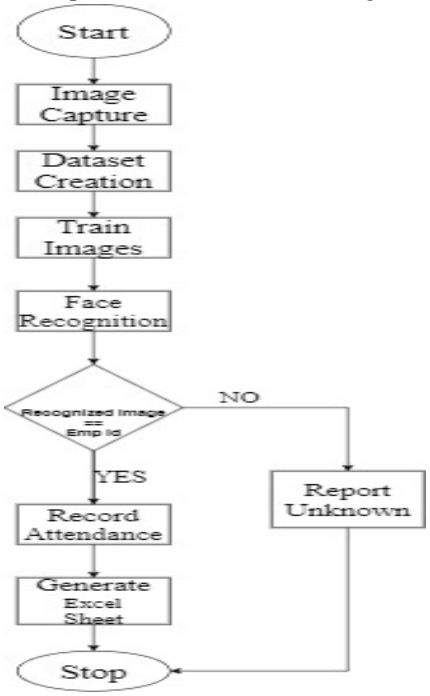

Fig 3: Flowchart for the methodology diagram

V. RESULT ANALYSIS

When we execute the programme, a window appears, asking us to enter our ID and name. After filling in the appropriate name and id fields, we must click the Take Images option. When you press the Take Images button, a camera on the computer starts taking image samples of the person.This Id and Name is stored in Employee Details folder and file name is saved as

EmployeeDetails.csv. It creates a sample of 60 photos and saves them in the Training Image folder. It informs you that the photographs have been stored after completion. After taking image samples, we must click the Train Image button to train the image samples. It now takes a few seconds to train the machine for the images, which results in a Trainner.yml file being created and stored in the TrainingImageLabel folder. All of the first settings are now complete. Following the completion of take photographs and train images, we must click the Track images option to track the faces. To track the faces, we must choose the Track images option after completing the take photographs and train images steps. After exiting, the attendance of a specific individual will be saved as a csv file in the Attendance folder with the name, id, date, and time, and it will also be available in the window.

Fig 4: User Interface View

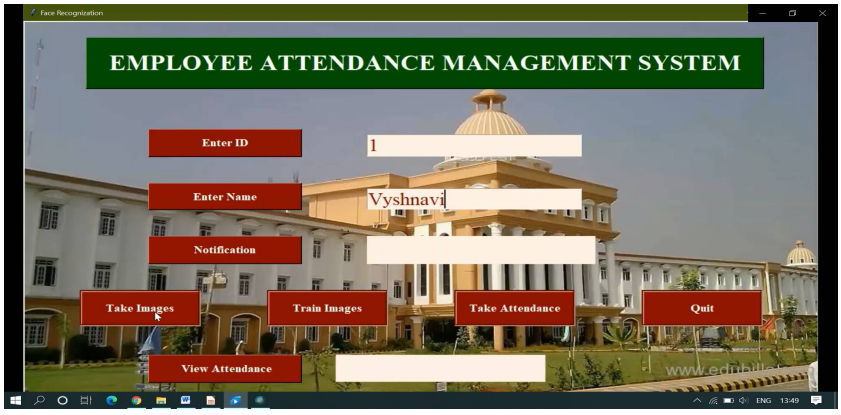

Fig 4: Entering Id and name of employee for saving purpose

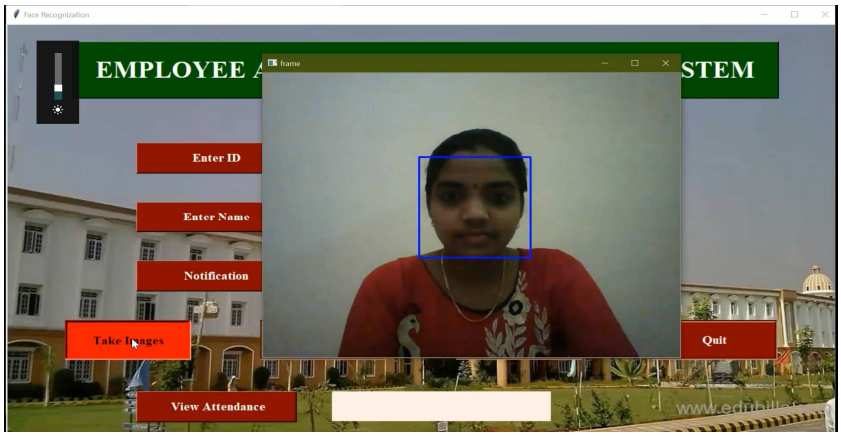

Fig 5: Taking images to be saved in Training image folder

Fig 6: Images are saved with the help of Id and Name

Fig 7: After images are trained,clicking take Attendance button opens webcam and recognizes face of employee with Id and Name

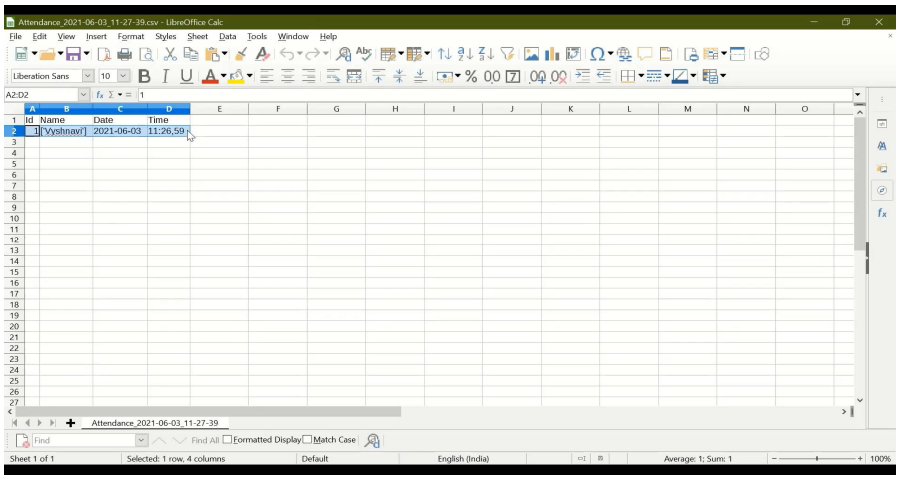

Fig 8: Attendance sheet

VI. CONCLUSIONS

We employed the Local Binary Patterns histogram technique to recognise faces in the suggested face recognition system. The entire technique is divided into three primary components: face detection, facial feature extraction, and image classification. The

Face detection process identifies a person's face in an input image. In the feature extraction step, face landmarks are extracted and used to create an LBPH histogram that produces a completely unique output, and in the recognition process, the input image's histogram is compared to the database histogram using the classifier. The outcome demonstrates that the system can distinguish between known and unknown individuals. The goal of developing a face recognition-based automatic attendance management system was to reduce the number of errors that occur in standard attendance taking systems. Our technology will help processors control attendance by saving time and reducing the amount of work they have to do. It cuts down on the quantity of human resources needed for the job. As a result, our system has been designed to produce the intended results.

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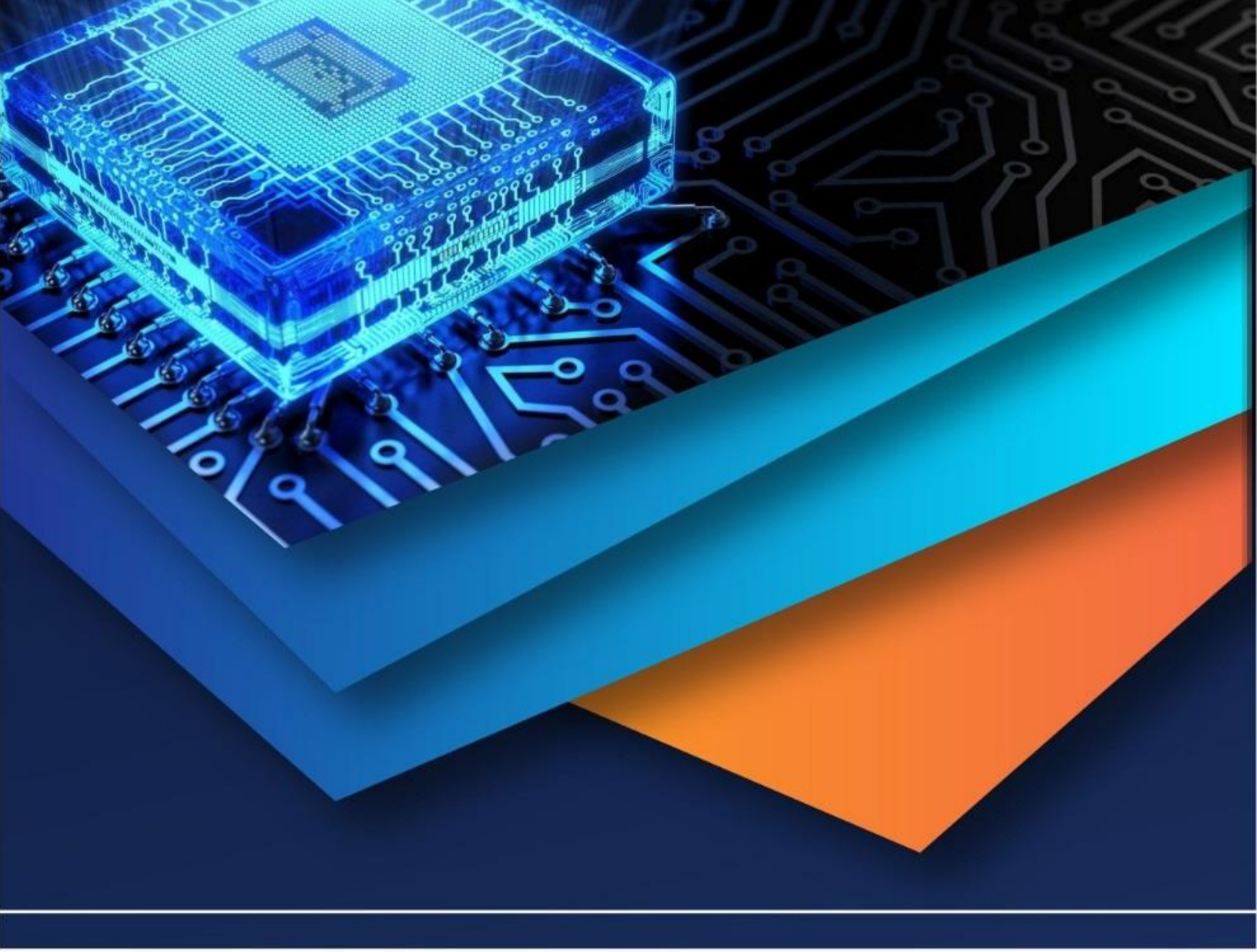
REFERENCES

[1] https://www.irjet.net/archives/V6/i4/IRJET-V6I41156.pdf, April, 2019..
[2] https://towardsdatascience.com/real-time-face-recognition-an-end-to-end-project-b738bb0f7348.
[3] Shubhobrata Bhattacharya, Gowtham Sandeep Nainala, Prosenjit Das and Aurobinda Routray, "Smart Attendance Monitoring System: A Face Recognition based Attendance System for Classroom Environment", 2018 IEEE 18th International Conference on Advanced Learning Technologies, pp.358-360, 2018.
[4] Ajinkya Patil, Mrudang Shukla, "Implementation of Classroom Attendance System Based On Face Recognition in Class", International Journal of Advances in Engineering & Technology. ISSN: 22311963, Vol. 7, Issue 3, pp. 974-979, July, 2014. (2002) The IEEE website. [Online]. Available: http://www.ieee.org/
[5] B. K. Mohamed and C. Raghu "Fingerprint attendance system for classroom needs", in India Conference (INDICON), 978-1-4673-2272-0/12/$31.00 ©2012 IEEE, pp.433-438*FLEXChip Signal Processor (MC68175/D)*, Motorola, 1996.
[6] Michihiko Minon, Weijane Cin, Tetsuo Shoji, "Face Recognition Based Lecture Attendance System" IEEE Transaction June 2013.
[7] Shireesha Chintalapati, M.V. Raghunadh, "Automated Attendance Management System Based on Face Recognition Algorithms", IEEE,Jan 2014.



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