International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 09 Issue: 04 | Apr 2022 www.irjet.net p-ISSN: 2395-0072

ATTENDANCE BY FACE RECOGNITION USING AI

SHAKYA AYUSH RAJESH[1], ACHAREKAR OJAS SHIVADATTA[2], GAIGOLE DIGVIJAY DILIP[3]

[1,2,3] *(Students of VPPCOEVA, Mumbai)*
[4] *Under Guidance of – Prof. MAHENDRA PAWAR Dept. Computer of Engineering, VPPCOEVA, Mumbai, India*

Abstract - *Students' attendance used to be manually recorded on an attendance sheet handed out by the teacher in class, which took a long time. A large classroom environment with distributed branches makes it difficult to verify whether the authenticated students are responding or not. Compared to other biometric options, FACE RECOGNITATION technology is gradually becoming a universal biometric solution. It is accurate and allows for a high rate of enrollment and validation. A face-recognition-based student attendance system has been proposed here. As a demonstration tool for educational institutions, the project aims to demonstrate Face Recognition in real time. In any environment, the system will mark and record attendance. When a student steps in front of the camera, the system will automatically identify, recognise, and record their attendance. Students will be notified via email when an attendance report has been generated.*

***Key Words*: Automated Attendance, Face Recognition, Face Detection.**

1.INTRODUCTION

A major issue in today's information system era is authentication. Human face recognition (HFR) is a well-known technique that can be used to verify the identity of a particular user. Face detection is the process of determining whether or not an already-detected object is a recognised face. When it comes to identifying human faces in digital images or video, face detection can be used in many different ways. Face detection and recognition are two different issues that are frequently conflated. To determine if a "face" is someone known or unknown, Face Recognition uses a database of known faces to validate the input face. An example of biometric software is Face Recognition, which creates a digital faceprint by mathematically mapping an individual's facial features (or expressions). In order to verify an individual's identity, the software uses Deep Learning algorithms to compare a live capture or a digital image to the stored face print. Faizan Ahmad et al (2012), Rabia Jafri et al(2009), E.Prathibha et al (2012), and Palabi Saikia et al (2012) all studied the effects of acupuncture on mental health.

1.1 Aim and Objectives

With face-recognition technology in mind, the goal is to create a hassle-free system for keeping track of attendance records. Marking attendance is a common practise in many workplaces, including schools, workplaces for both employees and students, and even in many businesses. Automating an existing manual system using computerised equipment and a full-fledged computer system fulfils their needs so that valuable data information can be stored for a longer period with easy access and manipulation of the same. The necessary hardware and software can be found easily and are simple to work with. Face-recognition-based automated student attendance is the goal of this project. As a result of these goals being met, the following outcomes are expected:

- Use 3D mapping to find the face segment.
- Find out what information you can use from a face you've just seen.
- The process of organising the features in order to identify the person whose face has been detected.
- The attendance of a specific student is being tracked.
- Send a letter to each of your students to inform them of the change.
- Reduce the amount of labour that is done by hand.

2. Literature Review

Domain Explanation

A method for performing operations on an image in order to produce an improved image or extract useful information from it is known as "image processing." It is a form of image processing in which an image is used as input and the output can be an image or the characteristics or features of that image. Today, image processing is one of the fastest-developing technologies. Engineering and computer science departments both use it as a primary research focus.

The three main steps in image processing are as follows:

- Acquiring the image and importing it using image acquisition software.
- The process of dissecting and modifying an image.
- Image analysis-based output, such as a modified image or report.

Detection of Faces: Face detection is the process of determining only the face portion of an image. It is possible for face detection and face recognition to fail for a number of reasons. It has been found that (Faizan Ahmad et al, 2012; Jawad Nagi et al, 2008)

Variations in the image's background and the environment in which people appear have an impact on the accuracy of face recognition algorithms.

Facial feature detection is hampered by illumination variations caused by different lighting environments.

Variation in the angle at which the facial image is acquired can distort face recognition, particularly for Eigen face and Fisher face methods.

Various facial expressions convey feelings and emotions through the use of facial expressions. Changes in facial-feature shape and spatial relation are caused by the expression variation.

Occlusion: When a portion of the human face is obscured, the term "occlusion" is used. Face recognition algorithms will perform worse because of the lack of information.

Images may be rotated, scaled, or translated in a way that distorts their original information.

In terms of biometrics, face recognition is one of the few that has both high accuracy and low intrusiveness at the same time. Even though a physiological approach is more precise, it is also more intrusive. A person's face image is entered into the database using a variety of methods. Automatic face recognition must be able to deal with a wide variety of images of the same face because of changes in the following parameters: Pose, Illumination, Expression, Motion, Facial hair, Glasses, and Background of the image. Personal identification, security system, image processing, psychology, computer interactivity, entertainment system, smart card and so on can all benefit from advanced face recognition technology. Face recognition, which has its roots in still image face recognition, can be performed in both a still image and a video sequence.

Scope

Compared to other biometric options, FACE RECOGNITATION technology is gradually becoming a universal biometric solution. It is accurate and allows for a high rate of enrollment and validation. Attendance systems like this one aren't just for educational institutions. It can be used in a variety of other fields as well. A similar system for tracking faculty absences can be implemented. All students in schools and colleges should have access to the system.

3. Existing System

Many engineering schools and businesses have devised sophisticated attendance tracking systems. There are some issues with the performance and stability of the systems that have been developed. Included in the current systems are:

What is the subject of this article?

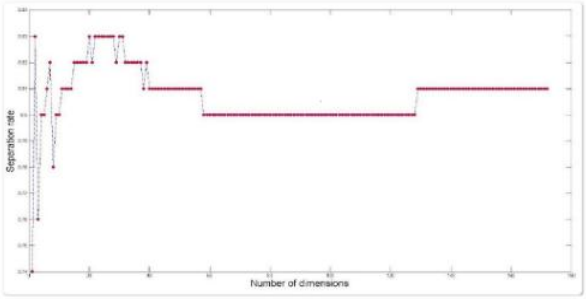
The Biometric based systems use a unique part of the human body, such as the iris, nostrils, retina, palm, fingerprints, etc., for attendance management purposes. As the data grows, so does the need for the system to be maintained, refreshed, and updated on a regular basis. Biometric-based systems are more expensive, but a computer or Android-based attendance system is more cost-effective. The main disadvantage of the iris recognition system is that it has the potential to cause damage to the eye.

System based on RFID

In addition to their ID cards, students in high schools and colleges receive RFID cards. Before entering the classroom, students insert their cards into the RFID reader. These systems necessitate constant monitoring due to the possibility of students inserting two cards into the RFID reader, creating a proxy, as well as the risk of damage to the RFID reader due to improper usage. RFID readers also need to be serviced on a regular basis.

4. Proposed System

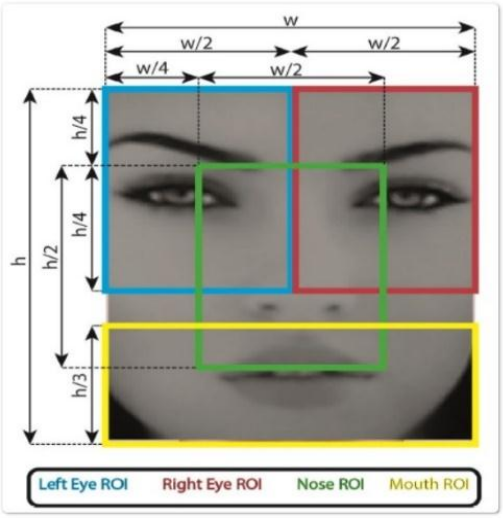
Facts are collected, interpreted, and problems are identified through system analysis. An investigation is carried out to determine the goals of a system or its components. Using this technique, you can improve the system and ensure that all of its components work together to achieve their goals.



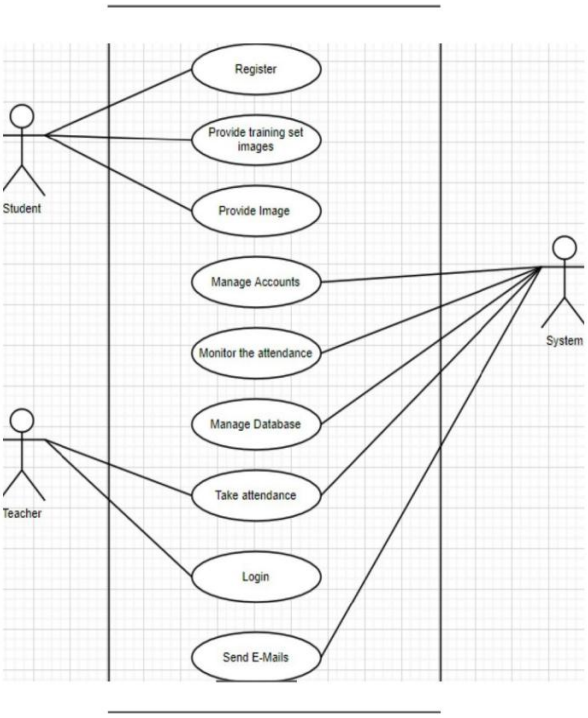
If you provide us with the images and 3D scans we need, we can produce the output you want.

If you show a photo, the 2D mapping feature will not work.

confined to his own computer. 3D mapping techniques have been employed. 2D Face recognition is not possible with this software. Creating digital 3D models of objects within a machine, like a computer, and then manipulating the model for any one of a number of different purposes is the goal of 3D Machine Vision technology.



We've designed an automated attendance-tracking system that uses face-recognition to verify its accuracy. The frontal image of the students is captured by a camera situated at a distance from the school's main entrance. Step 3: Find out what it looks like. It is always beneficial to use a face detection algorithm that is accurate and efficient. Algorithms called classifiers are used to identify whether an image contains a face or not. Face detection classifiers have been trained on tens of thousands to tens of millions of images to improve their precision.



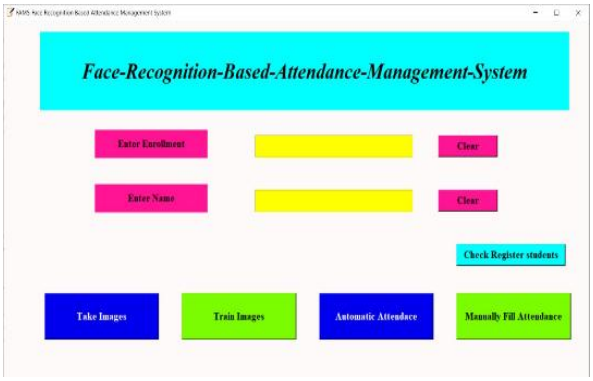


Figure 1: Interface

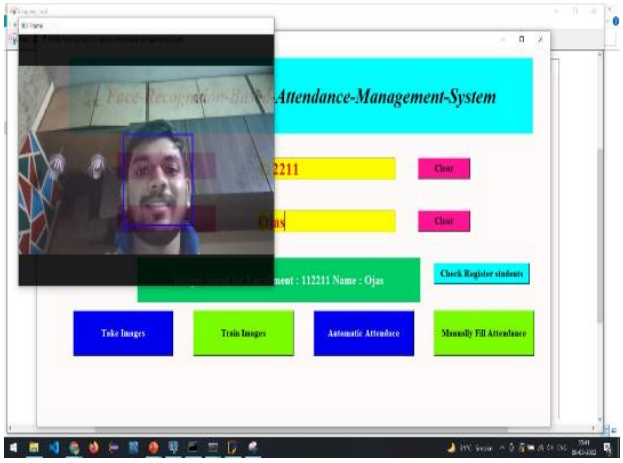


Figure 2: Facial recognition through scanning

Figure 3: An image saved to a database.

Figure 4: Model Training based on captured data

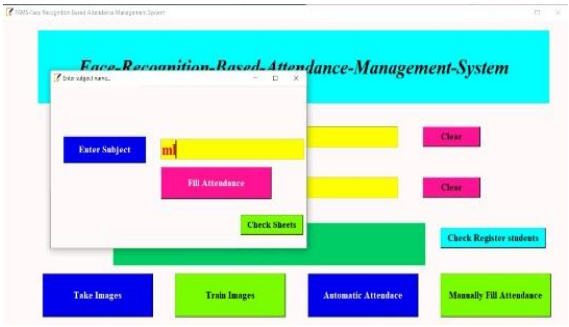


Figure 5: Automatic attendance interface

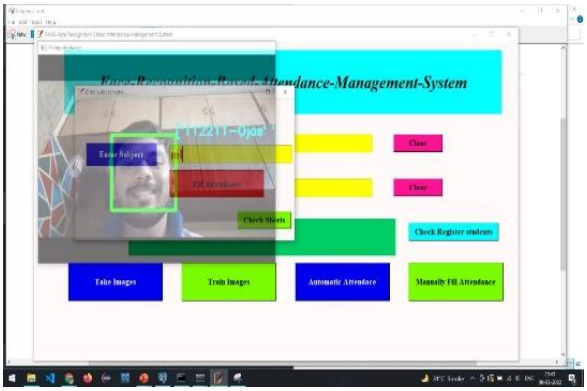


Figure 6: Attendance marked after detecting face

5. CONCLUSION

Deep facial recognition techniques were employed here to address the issue of face attendance checking. The system has a user-friendly interface that is accessible to both teachers and students. It is more efficient and less time consuming than the more traditional methods of recording attendance. Despite the low-resolution webcam on typical laptops, the application performs accurately on our private dataset. We can see from this that our underlying algorithm is effective in dealing with the problem of low-quality input data input. Our goal is to expand our dataset so that it is asymptotically related to real-world applications in the near future. The algorithm's ability to distinguish feature distributions of output classes will also be improved by considering additional algorithms. The project's accuracy and security could be improved in the future with the addition of iris scanner software. Based on real-time usage and scale, database changes can be made in real-time. Instead of a laptop, the system can be run on Raspberry Pi-compatible hardware.

6. REFERENCES

1. Pedersoli, and L. Van Gool, "Face detection without bells and whistles", European Conference on Computer Vision, pp. 720-735 , 2014. 9

2. J. Yan, Z. Lei, L. Wen, and S. Li, "The fastest deformable part model for object detection'', IEEE Conference on Computer Vision and Pattern Recognition, pp. 2497-2504, 2014.

3. X. P. Burgos-Artizzu, P. Perona, and P. Dollar, "Robust face landmark estimation under occlusion'', IEEE International Conference on Computer Vision, pp. 1513-1520, 2013.

4. X. Cao, Y. Wei, F. Wen, and J. Sun, ''Face alignment by explicit shape regression'', International Journal of Computer Vision, vol 107, no. 2, pp. 177-190, 2012.

5. T. Barbu, "Gabor filter-based face recognition techniquet", http://www. acad.ro/sectii2002/proceedings/doc2010-3/12-Barbu.pdf, 2008.

6. Opencv library, Haar-Like Cascade, https://docs.opencv.org/3.4.1/d7/ d8b/tutorial py face detection.html

7. Casasent, David P. "Experiments with two industrial problems using texture classification based on feature distributions." Proc Spie 2354(1994).

8. P. N. Belhumeur, J. P. Hespanha, and D. J. Kriegman. Eigenfaces vs. fisherfaces: recognition using class specific linear projection. IEEE Transactions on Pattern Analysis and Machine Intelligence, 19(7):711–720, Jul 1997

9. Ahonen, T, A. Hadid, and M. Pietikäinen. "Face description with local binary patterns: application to face recognition. " IEEE Transactions on Pattern Analysis & Machine Intelligence 28.12(2006):2037-2041.

10. Takeo Kanade. Computer recognition of human faces, volume 47. Birkh¨auser Basel, 1977.