IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

ATTENDANCE MONITORING USING FACE RECOGNITION

[1]Dr.Kalpana S , [2]Godwin Bright M , [3]Raju Kumar R, [4]Swarna Preetha R

[1] Professor, [2 3 4]UG Scholars
[1 2 3 4]Department of Artificial Intelligence and Data Science,
[1 2 3 4]KGiSL Institute of Technology, Coimbatore, India

Abstract: In a changing environment, automatic facial recognition technology has advanced significantly. Smart Attendance with Real Time Face Recognition is a practical solution that helps with managing the student attendance system on a daily basis. The technique of recognizing a student's face for collecting attendance using facial biometrics based on high-definition monitor footage and other information technology is known as a face recognition-based attendance system. In the face recognition project, a computer system will be able to quickly and accurately locate and identify human faces in pictures or videos being recorded by a security camera. The current issue with attendance tracking is that if the image that was collected doesn't match the student's face in the database, it is stored as a new image. In order to address the drawbacks of the proposed system, the student's face must be captured in a way that allows all of the student's facial features to be detected, as well as the student's seating and posture. Many algorithms and methods have been created to enhance facial recognition ability, however deep learning is the idea that will be used in this case.

IndexTerms: **Face Recognition, Deep Learning, Face Detection, CNN**

I. INTRODUCTION

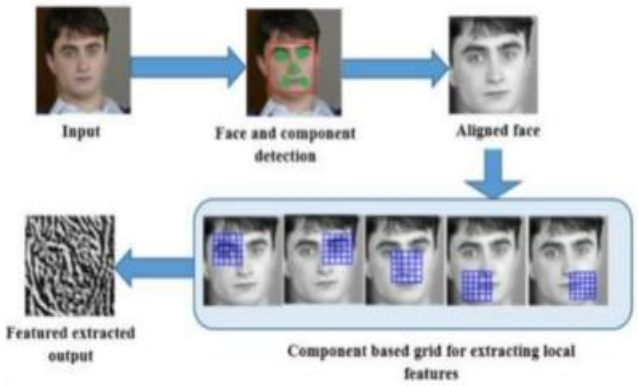
In many institutions, recording and keeping track of students' attendance is an extremely laborious task. Every institution has a unique way of taking attendance, whether it be through the use of an attendance sheet or some biometric methods. These methods take a lot of time, though. Typically, professors keep track of student attendance using an attendance sheet. This requires a great deal of effort and time. Whether the authenticated youngster is responding or not is unclear to us . Another timeconsuming task that is extremely critical and prone to error is the calculation of combined attendance. The attendance sheet might be missing or stolen by some of the pupils in a few distinct circumstances. In order to resolve these issues, we're in want of automated attendance marking systems. Maintaining attendance is a crucial duty in all schools to evaluate student performance. Every institute has a unique method for doing this. Some still rely on the outdated paper or file-based method, while others have adopted automatic attendance solutions that incorporate biometric approaches. There are numerous automated techniques available for this. One method of biometric identification is face recognition. The fact that it is regarded as one of the most successful applications of image analysis and processing is what has drawn so much attention to it in recent years. The facial recognition process can be broken down into two basic stages: processing prior to detection, where face alignment and localization (normalisation and localization) take place, and recognition following feature extraction. For automatic student attendance in the classroom without student input, this system employs a face recognition method. In order to record attendance, a camera is used to take pictures of the students, identify faces in those pictures, match the identified faces to a database, and mark the attendance.

1.1 FACE DETECTION:

This step's primary purpose is to assess whether and where human faces can be seen in a particular image. The patches that contain every face in the input image are the step's anticipated outputs. Face alignment is done to support the sizes and orientations of these patches in order to make a face recognition system that is later developed more reliable and simple to create. Face detection could be utilised for video and picture categorization, region-of-interest detection, retargeting, and more in addition to serving as the preprocessing for face recognition.

1.2 FEATURE EXTRACTION:

Human-face patches are extracted from photos following the face detection stage. First, each patch typically contains over 1000 pixels, which is too much for a reliable recognition system, making it difficult to use these patches directly for face recognition.



Second, face patches may be extracted from various camera alignments, with various facial emotions and illuminations, and they may be cluttered and obscured by other objects. Feature extractions are used to accomplish information packing, dimension reduction, salience extraction, and noise cleaning in order to get over these drawbacks. A face patch is often converted into a vector with fixed dimensions or a collection of fiducial points and their associated locations after completing this stage. In several academic studies, face detection or feature extraction Then, after performing face detection and feature extraction, we compare a face image's feature to each face class that is kept in the database.

Face recognition has two general uses; the first is for identification, and the second is for verification.

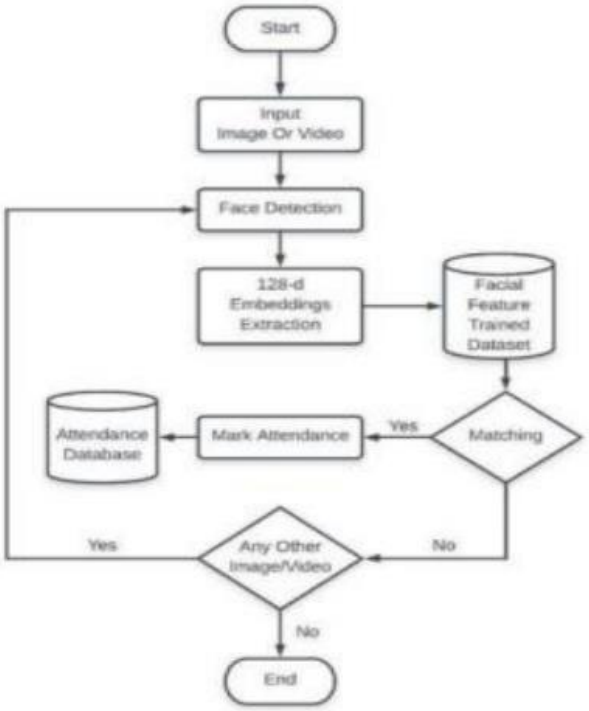
Give a face image, we want the algorithm to identify the person or provide the most likely match; in contrast, face verification requires both a face image and a physical description.

II. LITERATURE SURVEY:

There are several facial recognition and face detection techniques that are widely utilised and with accuracy levels greater than 80%.In [1] Xiao Han et al -have compared the Subspace method's performance, Face recognition techniques include the Geometric Structure, Local Feature, and Deep Learning methods. The Subspace approach, which transforms high-dimensional images into low-dimensional ones to facilitate feature classification, deals with spatial compression. It uses a variety of Face Recognition methods, including Independent Component Analysis (ICA), Latent Dirichlet Allocation (LDA), and Principal Component Analysis (PCA) (ICA). The local features approach divides the face into several local features, which are then used to identify the face. The challenging task of face recognition is dealt with via deep learning, which allows the machine to mimic the structure and functioning of the human brain. In [2] Viola Jones Algorithm for Face Detection was proposed by Paul Viola and Michael Jones . The system uses Haar characteristics to identify faces, and to increase its accuracy, it also incorporates the Ada boost learning method. In [3] Rafael Padilla et al, compared face detectors classifiers on the YAL and FEI face databases, which are separate. The YALE database contained 11 pictures of 14 people, however The FEI database had 11 Brazilian data sets photos of 280 people. FA1, FA2 frontal face classifiers were applied to the databases for analysis. The FA1 offered superior. outcomes using the YALE database, however FA2 offered superior outcomes using the FEI database. In [4] Poggio and Sung have improved the k-means classification algorithm in order to build For more information, see the six face categories and the six non-face categories. Faces and non-faces are clearly distinguished Face detection methods are classified as knowledgebased, feature-based, and templatebased. The knowledge-based approaches make use of facial geometry and features and point of view The efficiency of knowledgebased approaches, on the other hand, is easily influenced by the viewpoint [5], [6]. C. Zhang and Z. Zhang used a multi-task CNN to improve multiview face detection accuracy in [7], but the detection accuracy is limited by the initial detection windows produced by a faulty face detector. The contextual multiscale regionbased CNN in [8] makes use of a larger window at the expense of duplicating the classification head. It has, however, increased the memory requirement as well as the detection time.

III. PROPOSED METHOD:

An picture or video from an appropriate video source, such as a webcam, is the input to the attendance system. Face detection, the first and most important stage of the attendance system, is then performed on the input. Once every face has been found, the process of recognition begins[9]. The 128-d encodings are retrieved from the face using opencv. Important considerations include the distance between your eyes and the gap between your forehead and chin. The set of features collected from the input is then compared with the known encodings, or Trained features. One system recognises 68 facial landmarks that are essential to differentiating your face[10.]The attendance would be marked as present once the recognition was completed successfully.



IV. DEEP LEARNING ALGORITHM:

For the main and most crucial of all the phases, Face Recognition, Deep Neural Networks (DNN) in combination with OpenCV are preferred. For the purpose of detecting and identifying faces in the supplied image, the face recognition library and the OpenCV library, both of which are included with Deep Learning, are mostly utilised together. Three recognition phases—HOG, linear Support Vector Machine (SVM), and CNN—make up the opencv library face detector. CNN uses the Graphical Processing Unit (GPU), which can recognise a face from all appropriate angles, whereas HOG uses the Central Processing Unit (CPU), which searches for features of the face confronting the camera. For the detection, training, and recognition stages, we utilised CNN because it is more efficient than HOG.

V. METHODOLOGY:

Attendance monitoring with technical aid is a common process we find across Organizations today. Fingerprint based biometric attendance system is the most widely used information system across continents. The IOT based system uses a microcontroller-based circuit along with fingerprint sensor, minimal power supply and a wi-fi modem to interact with internet-based systems. Although the IOT based Attendance monitoring method is more secure it is overly dependent on the Equipment. In order to reduce manual intervention among each other in covid era, An automated system using surveillance cameras/ web cams is proposed to monitor Students. Since most of the student community is not vaccinated it would benefit them to the maximum. In the proposed system, the image is captured using an IP camera /web-cam installed in the classroom that covers the faces of all the students. In the preprocessing stage ,the captured image is fed to Open CV's Haar-like features algorithm and the location of all faces are recognized and cropped. The cropped images are used for facial Recognition In this system, attendance system which takes attendance by using face recognition technique. I have also intergrated it with GUI (Graphical user interface) so it can be easy to use by anyone. GUI for this project is also made on python using tkinter.

5.1 TECHNOLOGY USED:

1) tkinter for whole GUI
2) OpenCV for taking images and face recognition (cv2.face.LBPHFaceReco gnizer_create())
3) CSV, Numpy, Pandas, datetime etc for other purposes.

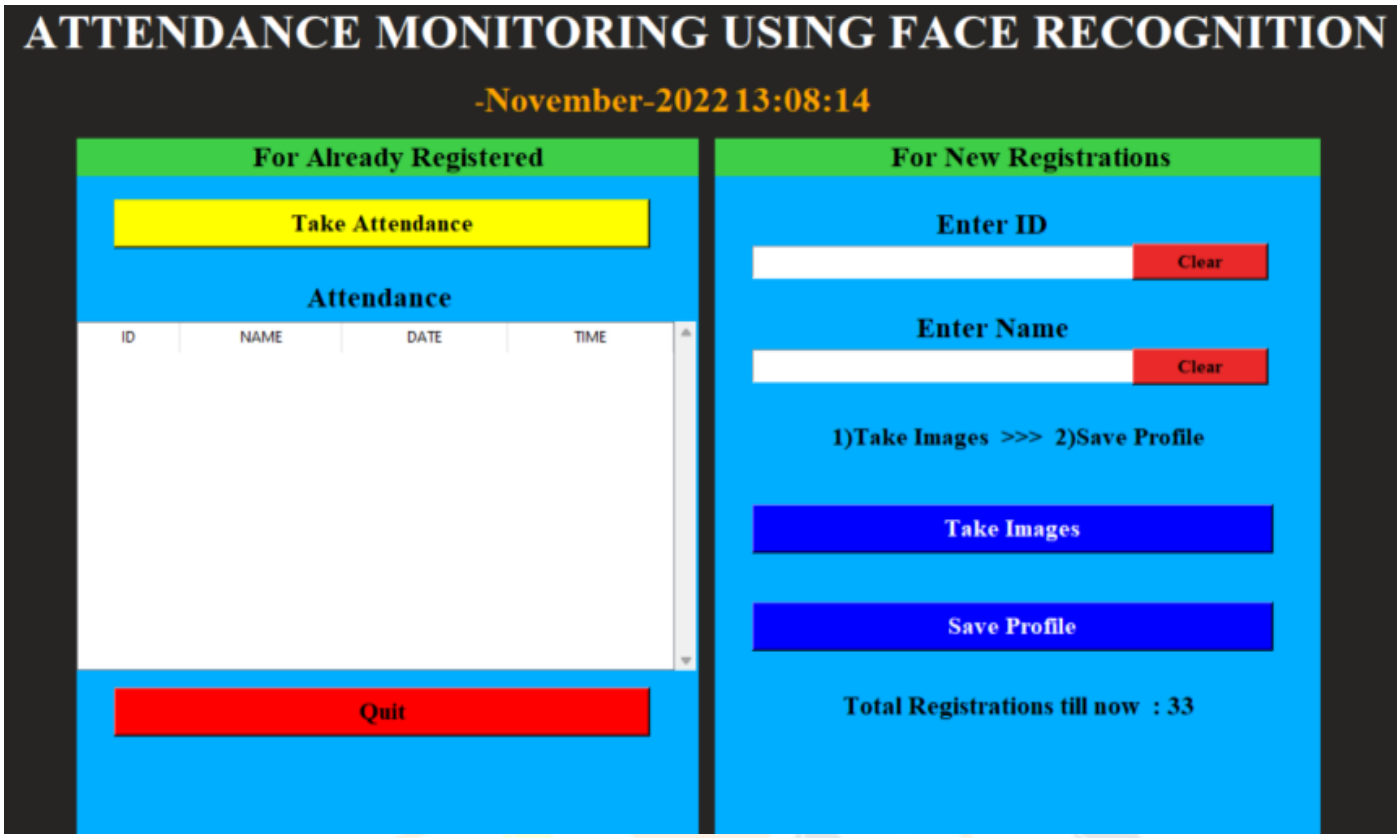
5.2 FEATURES:

1)Easy to use with interactive GUI support.
2) Password protection for new person registration.
3) Creates/Updates CSV file for deatils of students on registration.
4) Creates a new CSV file every day for attendance and marks attendance with proper date and time.
5) Displays live attendance updates for the day on the main screen in tabular format with Id, name, date and time.

VI. RESULTS AND DISCUSSION

This system aims to build an effective class attendance System using face recognition techniques. The proposed System will be able to mark the attendance via face Id. It will Detect faces via webcam and then recognize the faces. After Recognition, it will mark the attendance of the recognized Student and update the attendance record.

6.1 Results:



attendance monitoring using face recognition

4	20AI48	SWARNA PREETHA R
5	20AI04	ABINAYA
6	20AI05	ABIRAMI V
7	20AI05	ABIRAMI V
8	20AI07	ARCHANA V
9	20AI08	ARUN RAJ
10	20AI11	DHARSHAN
11	20AI12	DHANALAKSHMI I
12	20AI14	DURNAV PATNAIK
13	20AI16	FAZMILA FATHIMA
14	20AI18	GODWIN BRIGHT
15	20AI21	HARIHARAN S
16	20AI22	HARSHATH KUMAR
17	20AI23	JABIN

student details

Finally, Figure 5 depicts the attendance system's output. For new registrations, it requests an ID and a name, and it uses a webcam to train the student's face. Photographs will be taken and saved in the database. Already registered students only need to stand in front of the webcam, and the webcam will recognise their face and mark their attendance.

6.2 DISCUSSION AND CHALLENGES:

- In this part we discussed about how it works and we apply some challenge to the system .Here system will be mainly provided with different options such as, student registration, it classifies gender, unknown persons and mark attendance. Eg..The students are supposed to enter all the required details in the student registration form.
- After clicking on register button, the web cam starts automatically and window pops up and starts detecting the faces in the frame. Then it automatically starts clicking photos until 60 samples are collected or CRTL+Q is pressed.
- These images then will be pre-processed and stored in training Images folder.
- This is important because the list Of absentees will be ultimately mailed to the respective Faculty.

VII. ACKNOWLEDGMENT

We would like to thank Dr. Kalpana S, Head of the Department, Department of Artificial Intelligence and Data Science for her firm support during the entire course of this project work and who modelled us both technically and morally for achieving greater success in this project work.
We express our sincere thanks to our guide, Dr. Kalpana S, Professor, Department of Artificial Intelligence and
Data Science, for his constant encouragement and support throughout the course, especially for the useful suggestions given during the course of the project period and being instrumental in the completion of the project with complete guidance.
We also thank all the faculty members of our department for their help in making this project a successful one. Finally, we take this opportunity to extend our deep appreciation to our Family and Friends, for all they meant to us during the crucial times of the completion of this project.
A huge thanks towards the team members: Godwin Bright M, Raju Kumar R, Swarna Preetha R.

VIII. REFERENCE LINKS:

[1]- Xiaojun Bai,feihujiang ,tianyi shi,yuang Wu - Design of Attendance System Based on Face Recognition and Android Platform (2020)
https://ieeexplore.ieee.org/document/9239722

[2]-krishna mridha,nabhan tawnjih Yousef-Study and Analysis of Implementing a Smart Attendance Management System Based on Face Recognition Tecqnique using OpenCV and Machine Learning(2020)
https://ieeexplore.ieee.org/document/9509614

[3]-Jaehoon Paul Jeong,Minho Kim,Yeonghyeon Lee,Patrick Lingga-IAAS: IoT-Based Automatic Attedance System with Photo Face Recognition in Smart 9 Campus(2021)
https://ieeexplore.ieee.org/document/9289276

[4]-Hao Yang,Xiaofeng Han-Face Recognition Attendance System Based on Real-Time Video Processing(2020)
https://ieeexplore.ieee.org/document/9138372

[5] -Alavikunhu Panthakkan,Shanid Malayil,Hussain Al Ahmad-Random Interval Attendance Management System (RIAMS): A Novel Multimodal Approach for Post-COVID Virtual Learning(2020)
https://ieeexplore.ieee.org/document/9464290

[6] -Yoanna Martínez-Díaz,Luis S. Luevano,Miguel Nicolás-Díaz,Leonardo Change-Towards Accurate and Lightweight Masked Face Recognition: An Experimental Evaluation(2021)
https://ieeexplore.ieee.org/document/9648153/

[7] -Zhigang Gao,Yucai Huang,Leilei Zheng,Xiaodong Li,Huijuan Lu,Jianhui Zhang-A Student Attendance Management Method Based on Crowdsensing in Classroom Environment
https://ieeexplore.ieee.org/document/9356601/
[8] -Muhammad Zeeshan Khan,Saad Harous,Saleet Ul Hassan -Deep Unified Model For Face Recognition Based on Convolution Neural Network and Edge Computing(2020)
https://ieeexplore.ieee.org/document/8721062/

[9] -Rasha Ragheb Atallah,Amirrudin Kamsin ,Maizatul Akmar Ismail,Sherin Ali Abdelrahman-Face Recognition and Age Estimation Implications of Changes in Facial Features: A Critical Review Study-(2020)
https://ieeexplore.ieee.org/document/8361072/

[10] -Busra Kocacinar,Bilal Tas,Fatma Patlar Akbulut,Cagatay Catal A Real-Time CNN-Based Lightweight Mobile Masked Face Recognition System(2022)
https://ieeexplore.ieee.org/document/9795021/

[10] -Busra Kocacinar,Bilal Tas,Fatma Patlar Akbulut,Cagatay Catal A Real-Time CNN-Based Lightweight Mobile Masked Face Recognition System(2022)
https://ieeexplore.ieee.org/document/9795021/

[12]-Heydi Méndez-Vázquez,Luis S. Luevano,Miguel Nicolás-Díaz Towards Accurate and Lightweight Masked Face Recognition: An Experimental Evaluation(2022)
https://ieeexplore.ieee.org/document/9648153/

[13]-Jie Pan;Xue-Song Wang;Yu-Hu Cheng--Single-Sample Face Recognition Based on LPP Feature Transfer(2021) https://ieeexplore.ieee.org/document/7480758/

[14]-An-Chao Tsai,Yang-Yen Ou,Wei-Ching Wu,Jhing-Fa Wang Integrated Single Shot Multi-Box Detector and Efficient Pre-Trained Deep Convolutional Neural Network for Partially Occluded Face Recognition System- (2021) https://ieeexplore.ieee.org/document/9638690/

[15]-Meng Zhang,Daisuke Deguchi,Hiroshi Murase-Masked Face Recognition With Mask Transfer and Self-Attention Under the COVID-19 Pandemic(2022)
https://ieeexplore.ieee.org/document/9709324/

International Research Journal
IJNRD
Research Through Innovation