Review Analysis of Face Recognition Attendance System Based on Real-time Video Processing

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Abstract- Face recognition system has a bright future and a high market demand, thanks to the arrival of the worlds largest information era as well as the commercial viability of face recognition. The goal of this paper is to create a real-time video processing-based facial recognition attendance systems. The prediction accuracy of a face detection system during exact check-in, the consistency of both the face recognition attendance management system with real-time video computation, the truancy percentage of the face detection and recognition attendance monitoring system with real-time video handling, and the interaction configurations of the face detection and recognition attendance monitoring system using actual video production are the four important directions addressed in this article. The conception of an attending system that is based on face recognition technology is suggested, and study on a face recognition attendance system based on factual video processing is conducted after assessing the situation of these challenges. The movie face recognition has an accuracy rate higher to 85%, according to experimental results. Face recognition systems that automatically can save up to 65 percent in comparison to traditional check-in methods. The problem of pupils departing early and skipping courses has considerably decreased in recent years. Through this exploratory credential, the face detection and recognition period and attendance structure with actual video processing could indeed skills that make students' tasks in the timesheet check-in system, eliminate the complex nomenclature phenomenon, significantly improve category effectiveness, and play a key role in facilitating the development of the attendance structure.

Keywords *:* Video processing, face recognition technology, face recognition attendance, attendance system, video recognition.

I. Introduction

A technique based just on Viola Jones technique with face detection, following by the equalisation histogram for extracting features, as well as the (SVM) classifiers for facial recognition software was presented for developing an automation process for human identification and attending accountancy. developed an automated systems for face detection using the same method, as well as a classification for facial recognition software. These approaches, on the other hand, were based on traditional machines algorithms. A current FaceTime technique employs a cascaded deep neural network with face detection as well as a convolutional again for production of facial characteristics, which are subsequently utilised for recognition. Face identification using multi-task coalesced convolutions (MTCNN) and a Siamese neural network to capture facial features into a 128-element vector. Most commercially automation software utilizes close-up photographs of faces, with an open, well-lit face being the most important criterion for effective operation. Image process is done in steps, which is a time-consuming procedure. Face detection and recognition software application have rapidly grown as an information security technology throughout the world . a recent, specifically now, when acts of terrorism are on the rise, this technique has gotten a lot of attention. In the fields of public safety, civic economy, and home media, face identification system has a wide range of applications. The availability of staff must be recorded in the pipelines of normal businesses, that has become a fundamental obligation of the organisation. Needless mistakes frequently occur whenever these attending systems are designed. Using the present attendance tracking system for example, the study discovered it has a failure rate of around 5%, and that there'll be a phenomenon where palm prints could be hit, which has a significant impact on attendance effectiveness, especially for large participation sites where congestion is more likely. Workers swiped card with someone else is a problem with the cards attendance monitoring system, making it impossible to meet the goal of real-time attending. Face recognition provides greater accuracy and reliability than other two attendance methods as there are more locations for facial recognition software, which would be more exact than other methods. It is tough to congeal now that the situation has much improved. Despite the fact that China's studies into biometric technology was delayed, our scientific experts have caught up, and several key players in the area have created their own

industrial positions. With the introduction of the big data age of today's world as well as the economic value of biometric technology, the future of this research and technology is quite bright, and there is a lot of market demand for it. Faces in surveillance recordings are frequently subjected to severe picture blur, posture shifts, and obstruction. Ding C has suggested a complete framework based on deep learning to tackle the issues of video-based facial recognition software (VFR) (CNN). To compensate for the lack of genuine instructional videos data, Ding C deliberately blur the training data made of clear still photos in order to build a fuzzy and strong feature representation. CNN is encouraged to automatically discover fuzzy insensitive data utilizing data for training made up of still photos and generated fuzzy data. Secondly, CNN has presented a trunks branching CNN model (TBE-CNN), that extracts complementary from the entire face picture and patched all around face sections Data, in order to improve the resilience of CNN characteristics to posture shifts and occlusion. The beginning of the 20th century face identification problem has been investigated by researchers such as V B Nemirovskiy. The description is based on grouping the closeness of the chromatic distributions of the split image's brightness clusters. Nemirovskiy V B employs three sorts of distances to determine closeness: There are three types of distances: cosine, Euclidean, and Leibler. For picture segmentation and grouping of proximity measures, a recursive neural network programming model is utilised. Face recognition attendance management system with actual video computation is favourable to business development and will have a good impact on future business development. The goal of this paper is to create a real-time video processing-based face recognition timesheet system. Four inquiry experiments were performed as part of this project: the prediction accuracy of a face detection system during exact check-in; the consistency of the face recognition timesheet structure utilising actual video preparation; study of a skip rate of the face detection and recognition attendance system using actual video production; face detection and recognition attendance tracking interface setup using real-time video sorting The experimental findings show that attendance management system delivers the predicted timing & attended outcomes using facial recognition and a computer, demonstrating that the entire methodology is feasible. Students who completed the attending sign-in system accomplished their responsibilities swiftly, got rid of the confusing roll call sign, and rapidly grasped the sign of operations and function. Future technology timing and form of attendance tracking conversions have made significant advancements, dramatically enhancing the rates of attending and the dependability of face recognition technology. It is worth of your researchers' further investigation and realisation.

Any organisation that wants to analyze its members' success in part dependent on attendees must keep track of their attendance. Automated tracking that is exact and time and cost efficient is thus a pressing demand for today's large companies and enterprises. The process of face recognition may be characterised as the comparison of a still digital picture still or frames of a video produced from a video file to face images or attributes of existing facial images with the aim of verifying or identifying an individual. This is accomplished by comparing facial traits from a picture to faces in a collection. Because of its common use in security devices, the method may be likened to other finger print or eye iris recognizer. It is preferred because it is contactless and non-invasive, despite the fact that it is less accurate than iris and fingerprints identification. This innovative, yet divisive technology offers a wide range of applications, including improved human-computer interaction, video surveillance, automated picture indexing, and video databases, among others. Figure 1 depicts the entire process in a diagram to help visualise the series of events.
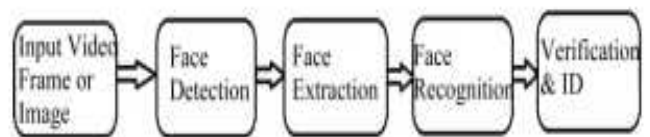

Fig.1 Systematic flow of generic face recognition

Monitoring attendance of students in each session is a moment task for university professors, especially when courses are big. Facial recognition is a method of recognising or verifying a person's identity in photographs, films, or in live time. The attending system can track employee whereabouts and date of checking in/out, as well as the results will be recorded down. The attendance system will next process the information and provide timesheet records. Students face a tremendous hardship if punctuality is tracked by hand. To solve this issue, a smart and automatic attendance system is being built. One of the technologies for detecting people and monitoring their attendance is facial images. To use this technique, the problem of proxy and student been labelled current even if they're not physically there may be readily solved. The gadget would therefore save not just time, but also the dedication that professors were supposed to bring to each lecture.

Face identification system, which is used to autonomously locate faces on video or identify people, is gaining popularity. The definition of "recognition" is the attribution of the examined item to one of recognised classes. "Identifying" is the process of determining the identification of a known thing to a know one based on the similarity of recognised attributes. Recognition software has a wide range of uses, including intelligent

safety and security systems, biometrics, safeguarding, verification, and attendee tracking, Machine vision, for example. Biometric identity methods are being created dynamically because traditional methods of identification, such like keys or passwords, do not give a high level of dependability. The face has a lot of benefits over other approaches for determining a personality:

• The individual does not have to be physically approached, and it's the most common method for bulk applications.

• There is no need for intricate or spend at least.

II. RELATED WORK

In this section describe about the existing work those provide Automatic face detection-

Justin Ker, [1] "Deep Learning Applications in Medical Image Analysis" In this title they discuss The tremendous success of machine learning algorithms at image recognition tasks in recent years intersects with a time of dramatically increased use of electronic medical records and diagnostic

imaging. This review introduces the machine learning algorithms as applied to medical image analysis, focusing on convolution neural networks, and emphasizing clinical aspects of the eld. The advantage of machine learning in an era of medical big data is that significant hierarchal relationships within the data can be discovered algorithmically without laborious hand-crafting of features. We cover key research areas and applications of medical image classication, localization, detection, segmentation, and registration. We conclude by discussing research obstacles, emerging trends, and possible future directions.

Chandra Prakash et. al[2] "Medical Image Fusion Based on Redundancy DWT and Mamdani Type Min-sum Mean-of-max Techniques with Quantitative Analysis" In this, author proposed 2 totally different fusion techniques algorithmic rule that are analyzed with quantitative metrics for 6 sets of brain pictures noninheritable from CT and MRI-T2. The experimental result shows that Mamdani sort MIN-SUMMOM outperforms RDWT from the seeing viewpoint and is additionally additional satisfactory as verified with the quantitative metrics. The fusion technique in medical pictures is helpful for capable disease diagnosing purpose. This paper illustrates totally different multimodality medical image fusion capability and their results determine with varied quantitative metrics. firstly 2 registered images CT (anatomical information) and MRI-T2 (functional information) are taken as input. After that the fusion techniques are apply onto the input pictures corresponding to Mamdani sort minimum-sum-mean of most (MIN-SUM-MOM) and Redundancy separate wavelet transform (RDWT) and therefore the resultant amalgamate image is analyzed with quantitative metrics particularly Over all Cross Entropy(OCE), Peak Signal –to- Noise ratio (PSNR), Signal to Noise ratio (SNR), Structural Similarity Index(SSIM), Mutual Information(MI). From the derived results it's inferred that Mamdani sort MIN-SUM-MOM is a lot of productive than RDWT and conjointly the proposed fusion techniques give more info compared to the input pictures as even by all the metrics.In author work is find that lower value of OCE in case of MIN-SUM-MOM indicates higher amalgamate pictures, higher values of PSNR signifies higher quality of pictures for MIN-SUM-MOM, higher values for SNR justifies that contrast info for amalgamate pictures were higher in MIN-SUM-MOM, higher values of SSIM just in case of MIN-SUM-MON justifies that the amalgamate pictures were almost like the initial input pictures {and higher|and higher} values of MI counsel that MIN-SUM-MOM offers better fusion results in comparison to RDWT. Therefore the amalgamate image obtained from MIN-SUM-MOM is a lot of informative and appropriate from the clinical perspective, for efficient retrieval purpose and therefore the amalgamate pictures also are obtained quickly thus it's better.

Yong Yang et al [3] "Medical Image Fusion via an EffectiveWavelet-Based Approach" In this author work the fusion of multimodal medical images plays an important role in many clinical applications for they can support a lot of correct info than any individual supply image. Author presents a completely unique wavelet-based approach for medical image fusion, that consists of 3 steps. Within the opening move, the medical pictures to be amalgamated area unit rotten into subimages by wavelet transform. within the second step, once considering the characteristics of HVS and therefore the physical which means of the wavelet coefficients, the coefficients of the low-frequency band and high-frequency bands area unit performed with completely different fusion strategies: the previous is chosen using a most visibility theme, and therefore the latter is chosen by a most native variance rule. so as to boost the standard of the resultant image, all the combined coefficients area unit then performed by a window primarily based consistency verification. Within the last step, the amalgamated image is built by the inverse wave rework with the composite coefficients. The performance of the planned technique is qualitatively and quantitatively compared with some existing fusion approaches. Experimental results show that the planned technique will preserve a lot of helpful info within the amalgamated image with higher spacial resolution and less difference to the source images.

Richa Singh et al [4] "Multimodal Medical Image Fusion using Redundant Discrete Wavelet Transform" In this author work a completely unique medical image fusion algorithmic rule is proposed that comes with properties of RDWT decomposition, normalized mutual info primarily based non-linear registration, and entropy primarily based info selection. The proposed algorithmic rule utilizes totally different options of Redundant

separate wavelet rework, mutual info primarily based non-linear registration and entropy info to improve performance. Experiments on the Brain net information show that the planned fusion algorithmic rule preserves each edge and element info, and provides improved performance compared to existing separate wavelet rework primarily based fusion algorithms. The algorithmic rule is evaluated on the Brain net information and experimental results showed that the proposed algorithmic rule conserves vital edge and spectral info while not a lot of of spatial distortion.

III. Method
Face Recognition Attendance System Based

Nowadays days, technology attempts to convey a large amount of knowledge-based technical advancements. Deep Learning is an intriguing subject that allows a machine to educate itself using data as inputs and then deliver an acceptable output throughout testing using various learning techniques. Nowadays, attendance is seen as a critical aspect for both students and teachers in educational institutions. With the progress of deep learning technology, the computer can now automatically recognise the kids' attending performance and keep records of it. In generally, a student's attendance management system can be kept in two different ways, namely,

- Manual Attendance System (MAS)

Ñ   Automated Attendance System (AAS).

Manual Student Attendance Management is a method in which a teacher in charge of a specific topic must manually called the students' names and record their attendance. Manually attention may be viewed as a time-consuming process, and it is possible that the instructor will miss someone, or that pupils will respond to the absences of their friends many times. As a result, the issue emerges when we consider the usual method of collecting class attendance. We use an Automated Attendance System to address all of these difficulties (AAS).

Nowadays days, technology attempts to convey a large amount of knowledge-based technical advancements. Deep Learning is an intriguing subject that allows a machine to educate itself using datasets as input and then deliver an acceptable output during testing using various learning techniques. Nowadays, attendance is seen as a critical aspect for both students and teachers in educational institutions. With the progress of artificial intelligence technology, the computer can now automatically recognise the kids' punctuality record and keep a record of it. In generally, a student's attendance management system can be kept in one of two ways: Manual Attendance System (MAS) or Automatic Attendance Management (AAS).
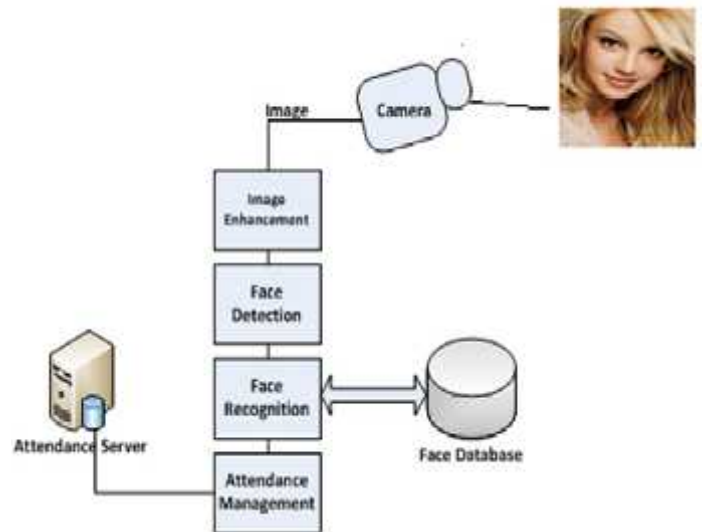

Fig.2 Face Recognition Attendance System Based

Input is passed through numerous "layer" of neural network models in deep learning models, each of which provides a reduced version of the data to the next layer.

The majority of algorithms perform effectively on datasets of just few thousand characteristics or columns. Unfortunately, an unorganized dataset, including one derived from a picture, has so many characteristics that this approach becomes inefficient or impossible. Machine learning algorithms can't handle 2.4 million parameters in a single 800-by-1000-pixel RGB colour picture.

Even as image passes thru every neural network layer, deep learning methods learn more about it. Early layers learn to recognise low-level elements like edges, while later layers integrate those features towards a more holistic picture. A intermediate layer, for example, may image is determined to detect sections of an item in a shot, including a leg or even a branch, but a deep layer would detect the whole thing, including a dog or even a tree.

Principal Component Analysis (PCA)- Principal Components, or PCA, is a dimensional space approach for reducing the dimension of big data sets by converting a large collection of factors into a small one that retains the majority of the data in the huge array.

Naturally, lowering the amount of factors in a data set reduces accurate; nevertheless, the answer to dimension reduction is to exchange some accuracy for simplicity. Since small sets of data are simpler to study and display, and also because machine learning techniques can analyse data more easily and quickly without having to deal with superfluous factors.

To summarise, PCA's goal is to decrease the number of variables in a data collection while keeping as much information as possible.

IV. Conclusion

In this research, we examine various author works using a facial recognition algorithm. These days, technologies attempts to convey a large amount of knowledge-based technical advancements. Deep Learning is an intriguing subject that allows a machine to educate itself using dataset as inputs and then deliver an acceptable outcome during testing using various learning techniques. Nowadays, attendance is seen as a critical aspect for both students and teachers in educational institutions.

References

[1] Vignesh S, Sriram A, Venkatesan G, Usha A "Face Mask Attendance System Based On Image Recognition" [2021].

[2] Shubham Kadam, Sagar Khedkar "Review Paper on Contactless Attendance System based on Face Recognition"[2021].

[3] Qiuyan Li "Research on the Application of English Course Online Examination System Based on Face Recognition Technology" [2021].

[4] Mohd Suhairi Md Suhaimin , Mohd Hanafi Ahmad Hijazi , Chung Seng Kheau , Chin Kim On "Real-time mask detection and face recognition using eigenfaces and local binary pattern histogram for attendance system" [2021].

[5] Hao Yang And Xiaofeng Han "Face Recognition Attendance System Based on Real-Time Video Processing" [2020].

[6] Lin Zhi-heng, Li Yong-zhen "Design and Implementation of Classroom Attendance System Based on Video Face Recognition" [2019].

[7] Edy Winarno, Imam Husni Al Amin, Herny Februariyanti "Attendance System Based on Face Recognition System Using CNN-PCA Method and Real-time Camera" [2019].

[8] Shreyak Sawhney, Karan Kacker ,Samyak Jain, Shailendra Narayan Singh , Rakesh Garg "Real-Time Smart Attendance System using Face Recognition Techniques" [2019].

[9] Mayank Kumar Rusia, Dushyant Kumar Singh, Mohd. Aquib Ansari "Human Face Identification using LBP and Haarlike Features for Real Time Attendance Monitoring" [2019].

[10] L. Deepshikha1 , Dr.Ch.Venkateswara Rao2 , G. Uday Kumar "Automated Attendance Management System Based on Face Recognition Algorithms" [2018].

[11] Shubhobrata Bhattacharya, Gowtham Sandeep Nainala, Prosenjit Das and Aurobinda Routray "Smart Attendance Monitoring System (SAMS): A Face Recognition based Attendance System for Classroom Environment" [2018].

[12] Yuslinda Wati Mohamad Yusof, Yuslinda Wati Mohamad Yusof, Muhammad Asyraf Mohd Nasir, Kama Azura Othman, Saiful Izwan Suliman, Shahrani Shahbudin, Roslina Mohamad" Real-Time Internet Based Attendance Using Face Recognition System" [2018].

[13] Sakshi Patel, Prateek Kumar , Shelesh Garg, Ravi Kumar "Face Recognition based smart attendance system using IOT" [2018].

[14] Smit Hapani, Nikhil Parakhiya,Nandana Prabhu, Mayur Paghdal "Automated Attendance System using Image Processing" [2018].

[15] Huda Mady, Shadi M. S. Hilles "Face recognition and detection using Random forest and combination of LBP and HOG features" [2018].

[16] Borra Surekha, Kanchan Jayant Nazare, S. Viswanadha Raju and Nilanjan Dey "Attendance Recording System Using Partial Face Recognition Algorithm" [2017].

[17] Akshara Jadhav, Akshay Jadhav Tushar Ladhe, Krishna Yeolekar "Automated Attendance System Using Face Recognition" [2017].

[18] Marko Arsenovic, Srdjan Sladojevic, Andras Anderla, Darko Stefanovic "FaceTime – Deep Learning Based Face Recognition Attendance System" [2017].

[19] Prof. Arun Katara, Mr. Sudesh V. Kolhe, Mr. Amar P. Zilpe, Mr. Nikhil D. Bhele , Mr. Chetan J. Bele "Attendance System Using Face Recognition and Class Monitoring System" [2017].