IMAGE PROCESSING BASED EMPLOYEE MONITORING SYSTEM

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Abstract—This DIP is a technique that has become inevitable in image-related research areas. Monitoring the work schedule, attendance, and health monitoring of employees in offices. So, the technology of image processing is useful to train the images to the system for recognition. And also, facilities provided to each employee play a major role in the health status of each employee is also monitored and coordination of employees and group work of employees of different domains plays a major role for the project completion in time without delay. Work-related stress causes serious psychological effects on employees. Thus, these evolutionary algorithms address real-time image-processing problems. As well as, to determine the characteristics of techniques. Eventually, we present different hopeful directions for research.

Keywords—component Face recognition, Attendance Project, Open CV, Face Detection System, Deep learning, Video Analysis

I. INTRODUCTION

In this world, the important is only time for developing our country. Every human can imagine a way to complete his work simply and uniquely. The olden procedure of marking attendance is waste of time and it will be difficult to take attendance when strength is high. From the biometrics attendance system developed, this technique generally has several processes like image acquisition, face detection, and recognition, database development, pre-processing feature extraction, and classification methods given by post-processing steps.

Automation of the Attendance system has the traditional method to save time and is also used for security purposes and fake free attendance, identification of early warning signs of disease or illness is possible through regular health checks. The primary main objective of face recognition is to recognize the faces of people and it uses mostly for security applications. Nowadays, in many applications face detection plays much interest as a crucial part in research and grasped more consciousness. It is a central segment of facial calibration and a basic path for many purposes.

The AI domain is in progress now, so there are some limitations. If distortion is found for this face detection process due to quality in the camera or noise in the environment or changes in hairstyles and makeup or may record facial expressions. For the above issue we will use the algorithm as a solution and for better recognition will store the many images of the same person is advance in the database. In biometrics, the security measures are affected by the face recognition process. AI is an uncompleted huge platform and is still in progress under research, companies are required to spend more money to continue the research and improve this platform. managing employees is becoming more crucial than ever in order to keep pace with the competing business world. Along with recording attendance for general measurement of individual working hours of the employees, it is the job of the administration of the companies to make sure that the employees are working while they are in their office campus. Traditionally, besides recording handwritten attendance, many of companies use fingerprint, facial and card-based attendance systems for automatically recording the office hours of the employees.

However, it is a practice very critical and time-consuming process for the administration to monitor every employee individually to ensure their presence in the workstations. In solution to this

problem, this paper presents a system that not only records employee attendance but also keeps track of the hours an individual employee spends in his workstation. Since a significant portion of the employees in every company generally performs desk jobs where everyone has a fixed workstation, this system can significantly improve the efficiency of the management by reducing the hassle of manually monitoring the presence of their employees monitored directly from the system using their preferred device (laptop or android device). The system performs human face detection and recognition.

The face recognition process has four steps:

1. Image acquisition is facial-scan technology that can be used to get a better quality and resolution using a 5mp camera acquise faces.

2. Image processing is a part of artificial intelligence for face detection and recognition that is a noise of the image and the cropped color in the image goes converted into black and white and then shown as a greyscale image.

3. Characteristic location matches the identical face dimensions that include the shape of the nose, eyes, cheeks of the face, and mouth are used to identify the registered person for mark attendance based on natural changes according to age like hairstyle, spectacles, facial treatments, etc.

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4. Template generating and comparing: By the facial structure of the registered person, we can create a resultant image between 100 bytes to 3k bytes. and matching performs detection and recognition within 10 to 20 trials with respect to 1 or 2 sec, as well as the figure showing the graph of face recognition. For face detection, there is an algorithm used for face detection named the "Viola jones" algorithm. this algorithm checks the shapes of the face, including our eyes, nose, mouth, etc, which helps to recognize the face properly. one of the advantages of face detection and recognition, when we use a powerful camera for this technology then it helps to aim the particular place where other people were present. This technology system can use anywhere like public places, airports, stadiums, etc.
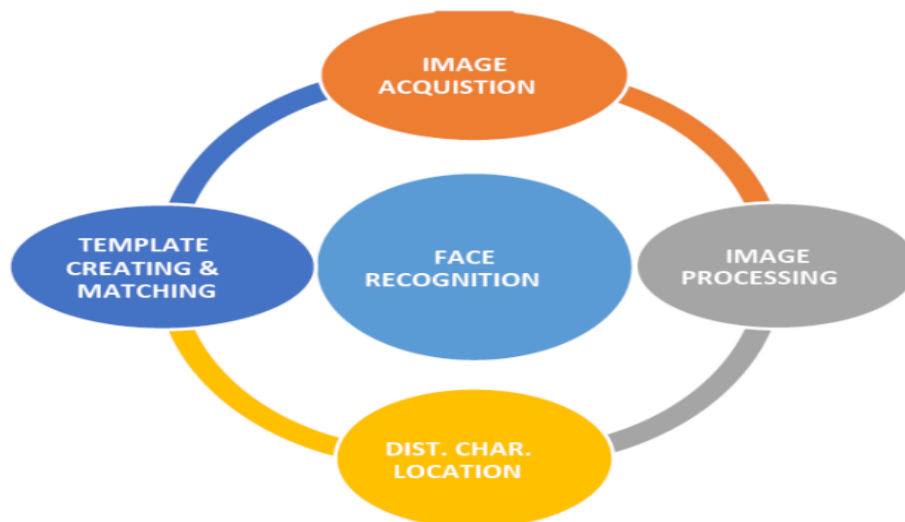
Computer vision is a field of artificial intelligence that involves the use of cameras and algorithms to analyze and understand images or videos. One application of computer vision is in the development of automatic attendance systems, where it can be used to automatically capture attendance data and store it in a central database.

By integrating computer vision with a real-time database, an automatic attendance system can be created that captures attendance data in real-time and makes it immediately available to authorized users for analysis and reporting. This can help schools, universities, and other organizations to efficiently manage attendance, identify trends, and address issues related to absenteeism or tardiness.

The process of creating a computer vision-based attendance system involves installing cameras to capture images of students, developing algorithms to analyze the images and identify students, integrating the attendance data with a real-time database, and providing authorized users with access to the attendance records.

Overall, a computer vision-based automatic attendance system that uses a real-time database can provide an accurate and efficient way to capture attendance data and manage attendance records, while also allowing for easy analysis and reporting of attendance trends.

II. PROPOSED METHODOLOGY

A. Computer vision

The proposed methodology for implementing a computer vision-based automatic attendance system using a real-time database can be broken down into the following steps:

Hardware setup: Install cameras at the entry points to the classroom or lecture hall to capture images of students as they enter. The cameras should be positioned and configured to capture high-quality images.

Image processing and recognition: Develop an algorithm using computer vision techniques to analyze the images captured by the cameras and identify students. This can be done using methods such as facial recognition, object detection, or image processing.

Integration with real-time database: Integrate the attendance data captured by the computer vision algorithm with a real-time database. This can be done using APIs or other integration tools.

Attendance tracking and storage: Once the integration is complete, the system can track attendance in real time and store it in the database. This allows authorized users to view attendance records and identify students who are absent or late.

Analysis and reporting: Authorized users can analyze and report on attendance data using tools such as dashboards or reports generated from the real-time database.

Monitoring and optimization: The system should be continuously monitored to ensure that it is capturing attendance data accurately and efficiently. Any issues should be identified and addressed promptly to optimize the system's performance.

By following this methodology, a computer vision-based automatic attendance system using a real-time database can be created that captures attendance data in real-time and makes it immediately available for analysis and reporting by subtracting in and out time from 24 hours. This can help schools and other organizations to efficiently manage attendance, identify trends, and address issues related to absenteeism or tardiness.

B. Haar Cascade

The fundamental method for Haar cascade classifier detection of an object is Haar features. Pixel density values using for comparison between adjacent rectangular pixel groups. Initially, examining the facial characteristics of a registered person, such as mouth, nose, and eyes require training by using the Haar Cascade classifier. Ada Boost and Haar Cascade classifier combination is used to training dividers. Intel Open CV is a library that is used in conjunction according to applications of HCI, robots, security purposes, and image processing. And also, in the visualization and implementation of the Haar classifier for training and acquising the system. This person's face will detect using the algorithm.

C. Health monitoring

An individual cannot take care of his/her health during working hours. Due to emotion detection, the illness of employees can be noticed through team-related health.

The main objective of this health monitoring is to observe and record the employee's health to support their family and avoid unnecessary medical leave. And also, notifies the hospital in case of an emergency. So, every individual doesn't fear for their health and completed their work properly and on time also, maintain health and a perfect lifestyle.

III BLOCK DIAGRAM
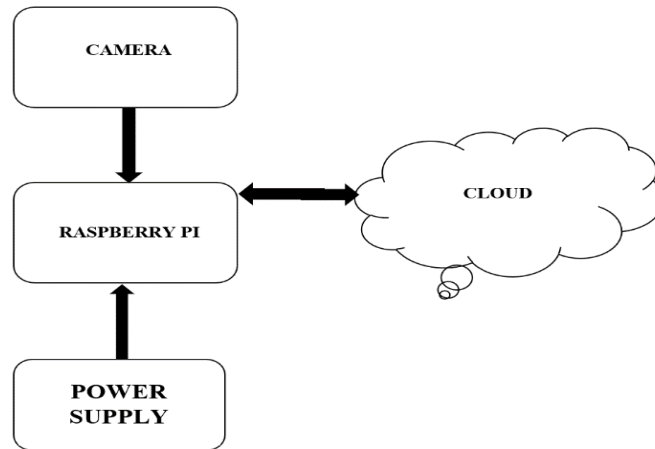
IV FLOW CHART
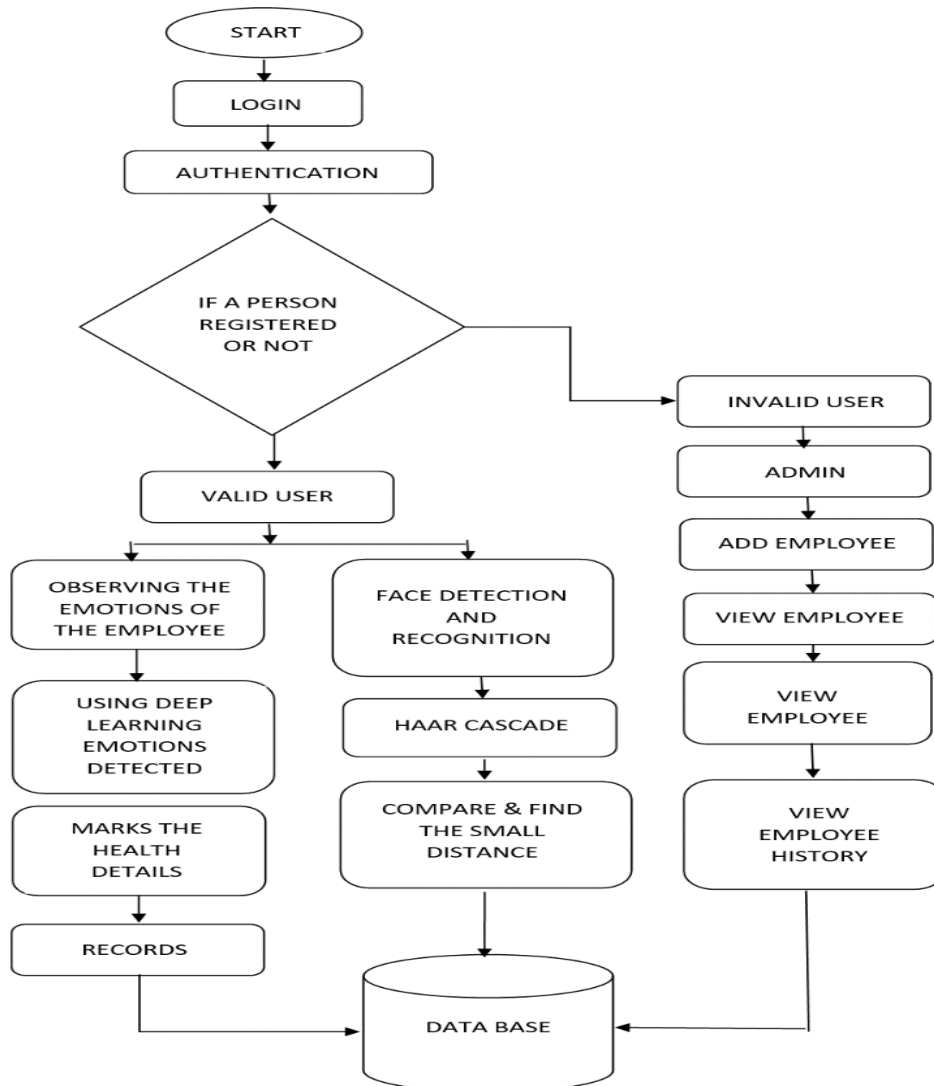
V LITERATURE SURVEY

[1]. (Shrestha Chin Alapati, M.V. Raghunath in the year 2013), the main objective is when the person gets into the classroom face recognition attendance will be provided. This methodology was LBP (1994), and SVN (1995). The advantages are time-saving and ease to monitor the students. Disadvantages are, it has less recognition rate and low performance. [2]. (Md. Jahangir Alum, Md. Rumen Bin Ashraf in the year 2014), the main objective is, it records the employee's attendance and keep track of the hours an individual employee spends at his workstation and monitor the presence of employees. This methodology was Haar transform (1909), Cascade classifier (2001), and Face recognition (1969). The advantages are easy to detect the students and easy to identify. Disadvantages are, it has high cost and is difficult to design. [3]. (S. Saleem Azad, Syed Sami Uddin in the year 2015), the main objective is, the identification of human beings is traced, Facial features of each and all students are also extracted. This methodology was PCA (1901) and SIFT (1999). The advantages are easy to recognize the person and easy to detect the authorized persons. The disadvantages -are, it is difficult to design and detect unauthorized persons. [4]. (Pooja G.R, Poornima M, Palak Shi in the year 2016), the main objective is, to record the status of the students whether he/she present in the class and attendance marking system. These methodologies are Cascade (2001) and Hoar (1909). The advantages are high accuracy and time-saving. Disadvantages are, it has high cost and is difficult to design. [5]. (Paul Viola, Michael J. Jones in the year 2017), the main objective is, to detect the student's face and the presence of the student in the class. This methodology was Face detection (1966), Boosting (1997), and Human sensing (2017). The advantages are easy to recognize and time-saving. Disadvantages are, it has low performance and a low recognition rate. [6]. (Dr. shrija Madhu, Ms. Anusha adapa in the year 2019), the main objective is an automated attendance management system, the predicament of recognition of faces in a biometric system. This methodology was LBPH (2017), HOG (2020), Face detection (1966), and Face recognition (1967). The advantage, easy to identify the person. Disadvantages are it has less recognition and low performance. [7]. (Dad peer. T, Chandrika, Neha A Biradar in the year 2019), The main objective is, to track the employee using an android mobile phone and also back the employee's current location by tracking. This methodology was Tracking (1980), and Visualization (1984). The advantages are involving less manpower to take attendance. Disadvantages are cost is high and low performance. [8]. (J. Geetha Ramani, Madhusudan. S in the year 2020), the main objective is, to monitor the health of every employee and measure the BP, heartbeat, pulse rate, and health parameters, etc… This methodology was Image processing (1960) and matching (1975). The advantages are easy to detect and monitoring is easy. The disadvantages are high cost. [9]. (Muhammad Farhan, Waqas Ahmad Siddique in the year 2020), the main objective is, to find the age and gender of every person. This methodology was Face detection (1966), Image processing (1960), Template creation (1979), and matching (1975). The advantages are easy to detect and easy to monitor. The disadvantages are, it is difficult to design and the cost is very high. [10]. (Akash Sharma, Anurag Kumar in the year 2022), the main objective is, to identify the presence of a person in the room (or) building currently, and exit time is also recorded. This methodology was Haar cascade (1909), LBPH (2017), Face recognition (1967), and HOG (2020). The advantages are easy to track the person and easy to identify the location of the person. Disadvantages are, it does not identify unauthorized persons and the cost is high.

VI RESULT

The CNN algorithm and Open CV is developed using image processing to monitor the employees and their attendance is monitored using CNN and recognize the emotion of employees and based on their emotions monitored the health of employees.by using the algorithms of CNN, Open CV in the application of image processing

VII CONCLUSION

The article concludes with a method of CNN based image processing that detects and recognize the result obtained with various DIP methods like CNN, Open CV. In this article ,we have discussed the importance of CNN, and the recognition of CNN based image processing and also recognize the emotion of employees based on emotion will recognize the health of employees. Finally we analyzed and implemented the attendance and health of employees who is present in offices .WE concluded and observed practically, that CNN and Open CV show better output for monitoring the employees

VII.REFERENCES

[1] [1] B. K. Mohamed and C. Raghu, "Fingerprint attendance system for classroom needs," in India Conference (INDICON), 2012Annual IEEE. IEEE, 2012, pp. 433–438.

[2] [2] T. Lim, S. Sim, and M. Mansor, "RFID based attendance system," in Industrial Electronics & Applications, 2009. ISIEA 2009.IEEE Symposium on, vol. 2. IEEE, 2009, pp. 778–782.

[3] [3] S. Kadry and K. Smaili, "A design and implementation of a wireless iris recognition attendance management system," Information Technology and control, vol. 36, no. 3, pp. 323–329, 2007.

[4] [4] T. A. P. K. K. L. P. M. L. M. P. A. W. G. D. P. J. G. RoshanTharanga, S. M. S. C. Samarakoon, "Smart attendance using Realtime face recognition," 2013.

[5] [5] P. Viola and M. J. Jones, "Robust real-time face detection, "International journal of computer vision, vol. 57, no. 2, pp. 137–154, 2004.

[6] [6] GANESH E. N, "Health Monitoring System using Raspberry Pi and IOT", Oriental Journal of Computer Science and Technology, ISSN: 0974-6471, Vol. 12, 2019.

[7] [7] Mohd Abdul, "IoT Based Patient Monitoring System Using Raspberry pi", IJRECE VOL.7 ISSUE (APRIL- JUNE 2019) ISSN: 2393-9028(PRINT) ISSN: 2348-2281 INTERNATIONAL Journal of Research In Electronics And Computer Engineering A UNIT OF I2OR 2976.

[8] [8] Madhusudan S, Nila.A. L, Pradeep. A, Manibharathi.S, Dr. J. Geetha Ramani (2019) "Employee Health Legacy", International Journal of Emerging Technology and Innovative

Research (JETIR), ISSN UGC Approved (Journal No: 63975) & 5.87 Impact Factor, Published in Volume 6 Issue 6, June 2019.

[9] [9] AleksandarKotevski, NatasaKoceska, and SasoKoceski, "E-health monitoring system", International Conference on Applied Internet and Information Technologies, 2016.

[10] [10] Xu, B., Xu, L.D., Cai, H., Xie, C., Hu, J., Bu, F.: Ubiquitous data accessing method in IoT-based information system for emergency medical services. IEEE Trans. Ind. Inf.10(2), 1578-1586 (2014).