ATTENDANCE MONITORING IN EDUCATIONAL INSTITUTIONS USING SMART CCTV

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Abstract: Smart CCTV Camera is basically implemented using Machine Learning in python. This project mainly focuses on how can we bring the changes in the traditional CCTV. Manual way of taking attendance is classroom is very difficult task. The main objective of this work is to reduce human task and make attendance system efficient and reduce time consumption. The proposed system is made by use of face detection and recognition algorithms. This system records attendance by using recognition technology. In this system, faces will be recognized and then attendance is marked and stored in the database which can also be exported. This will be very useful for security purpose and in can be implemented in all real-time security applications.

Index Terms **– Face Detection, recognition**

I. INTRODUCTION

Machine learning is a is the study which gives computers the ability to learn without being programmed explicitly. It is a type of AI, due to which applications become more accurate in predicting outcomes without being explicitly programmed. Algorithms in machine learning use some data as input and predict new values as output. Machine Learning is one of the best technologies that everyone have come across. As it is given in it's name, it gives the computer that makes it similar to humans: The ability to learn like humans. Machine learning is been actively being used everywhere, in many places. Machine learning is a subfield of computer science which was evolved from the study of pattern recognition and computational learning theory in artificial intelligence. Machine learning also describes the construction and algorithms that can learn from and make predictions on input data. It also saves detected images and recognizes too.

In modern countries, they are using Image processing-based security system to provide security in many areas. It has been a common research area of interest in electronic literature. Normally Significantly understudy appearance sheet which is given to the employees is utilized to take the understudy the participation, yet it might give the idea that miss somebody or a few understudies answer on different occasions. In other cases, the appearance sheet may be misplaced or lost. To reduce such problems a smart attendance management system be needed. In this paper we are discussing about live attendance and security purposes. security and crime detection are observed and conducted by the security guard.

So, using this system will reduce dependency on human, save money and provide an accurate result. The most difficult task in various schools/colleges is student attendance. Every schools/college/office are taking attendance manually by using an attendances sheet or with the help of biometric, but using system consume so more time. Traditional camera's having ordinary features like recording videos and live streaming for most of the security purposes. But in this project, we are improving the performance of camera's so that it can be used in schools and offices for attendance purpose and security purposes also. In live attendance monitoring Haar cascade using OpenCV Algorithm used for object detection. While entering the room detection of face is detected and recognized using CNN. Here Dataset of students is created before the recognition process. Dataset was created by using real time photo. For better accuracy minimum images of each student should be captured. Whenever we register student's details along with images in our system to create dataset and store in student facedata folder to recall that face in attendance process. This process applies to each image taken during attendance. At present facial recognition and image processing is a very interesting topic that has facial recognition is quickly surpassing other forms of biometrics as facial recognition systems use a set of features that are different to one person. Compared to existing system, this system reduces the workload of people. This will be very useful for security purpose and incan be implemented in all real-time security applications.

Figure 1: Training of data using CNN

II. LITERATURE SURVEY

[1] Akshay Bharadwaj K H author briefs about auto face identification from the observation cameras. Increasingly more CCTVs and observation cameras are being introduced each day. On the off chance that there is the data set of facial information present the assignment of acknowledgment reduces to examination of every single face identified from the video with each face saved in the data set. The framework needn't bother with a data set to begin with. It makes its own assortment of pictures and afterward tracks the element events of those pictures. Eigenface, fisher face, LBP histograms and SURF are various calculations utilized for this framework for face acknowledgment. SURF shows better outcome.

[2] Shiju Sathya Devan author examines Safety and security are significant worries in cutting edge period. Individuals utilize security instruments to defend their property be it's anything but an organization. Present security systems made use of different sensors for movement and cameras for video recording i.e., Perimeter Intrusion Detection Systems. This task targets giving one such plan to guarantee wellbeing and security of one's own property. In this paper we propose to furnish a Smart CCTV Surveillance framework with interruption discovery. Numerous USB cameras are introduced at various areas for live streaming and checking purposes. This framework performs face acknowledgment as a confirmation methodology and cautions the proprietor when an obscure face is identified by sending an email with the preview of obscure face and a SMS. Live feed from numerous cameras can be seen through cell phones. Face recognition innovation has progressed significantly over the most recent twenty years. Today, machines can consequently check character data for secure exchanges, for reconnaissance and security assignments, and for access control to structures. These applications as a rule work in controlled conditions and acknowledgment calculations that can exploit the natural requirements to get high acknowledgment precision. Escalated research is going on in the field of interruption identification. In our task we've figured out how to foster a strong, adaptable face acknowledgment framework with off the rack parts.

[3] Kehtarnavaz author presents a profound learning-based way to deal with identify and characterize people in video information caught from distances of a few miles by means of a powerful focal point camcorder. For identification, a bunch of computationally effective picture preparing steps are considered to distinguish moving regions that contain an individual. These regions are then gone to a convolutional neural organization classifier whose convolutional layers comprise of the Google Net exchange learning. Presently, with a purposeful public-private association, we can take it standard.

III. PROPOSED SYSTEM

The main objective of this work is to include features like Counting number of people in a room along with capturing them andstoring in a respective file

- Also, the live attendance monitoring system in smart CCTV
- To detect the face when someone enters the room and then save it in database for further actions,
- Able to see any specific days Attendance report.

Existing system contain Live streaming of videos, faces separately in different systems. In earlier, database was not used to store the images. Drawbacks are, less security and more time consuming. In this project proposed system and advantages are Detects faces and then store in database Smart CCTV Camera counts the number of people in room along with captured photos Captures the images and saves the timings including milliseconds and it will store them in a respective file. There will be more security than existing CCTV camera Can be used in colleges for attendance purpose.
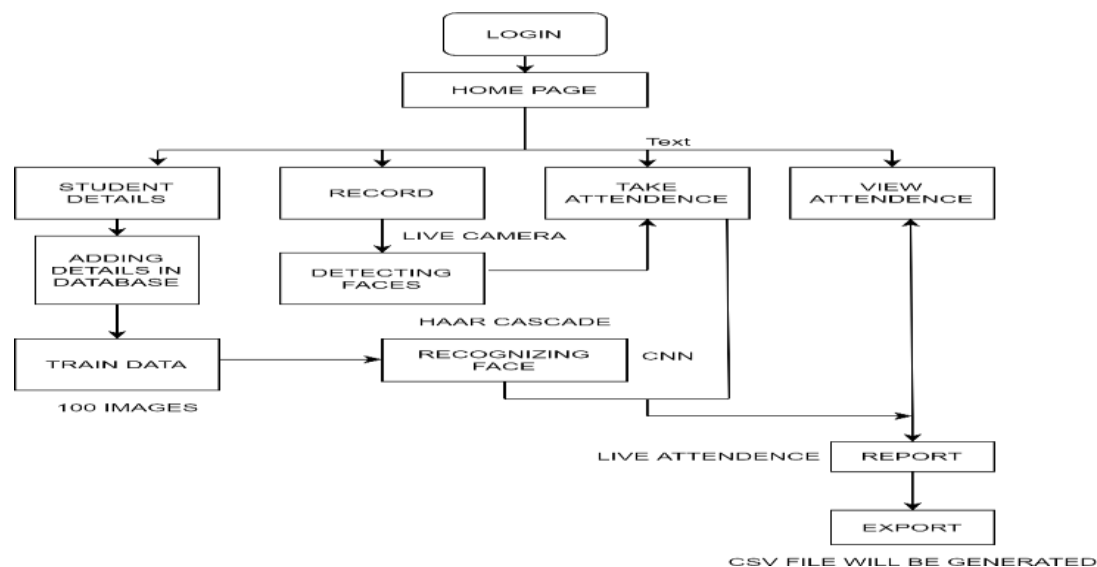
Figure 2: Block Diagram of Attendance using smart CCTV.

IV. SYSTEM REQUIREMENTS

Languages Used for Implementation
- Python
- SQL

4.1 Functional Requirement

4.1.1 Webcam

A webcam is a camcorder that feeds or transfers a picture or video continuously to or through a PC to a PC organization, like the Internet. Webcams are normally little cameras that sit on a work area, connect to a client's screen, or are incorporated into the equipment. Webcams can be utilized during a video talk meeting affecting at least two individuals, with discussions that incorporate live sound and video. In our venture webcam work is to simply catching the movement of shaded marker with camera. The greatest goal of a webcam is likewise lower than most handheld camcorders, as higher goals would be diminished during transmission.

4.2 Hardware Requirements

4.2.1 Laptop

A work station is a PC intended for normal use at a solitary area on or almost a work area or table because of its size and force necessities. The most well-known setup has a case that houses the force supply, motherboard , memory, transport, and other electronic parts, circle stockpiling normally at least one hard plate drives, strong state drives, optical plate drives, and in early models a floppy plate drive a console and mouse for input; and a PC screen, speakers, and, frequently, a printer for yield. The case might be arranged on a level plane or in an upward direction and set either under, additionally, or on top of a work area.

V. SYSTEM ANALYSIS

In "Smart CCTV" proposed framework we have started a strategy for recognizing faces when an individual goes into a room by utilizing face recognition which will identify face and catches the pictures and afterward matches it with the dataset. Assuming an individual's face matches with the dataset, it will show the name of the individual. Extra component of tallying number of individuals going into the room and leaving the room is added which is finished utilizing OpenCV. The framework assumes a significant part in security purposes. Acknowledgment of appearances will be done and afterward contrasted and the data set and afterward saves the individual caught photographs in organizers and just as in Databases. It can likewise check the quantity of individuals present in a room. This framework can fundamentally be utilized in universities and workplaces.

VI. METHODOLOGY

Smart CCTV System catches picture of an individual whenever distinguished, and afterward gives a Live Attendance. Live attendance is determined consequently and shown on the right side of the home page. The details of the students have to be stored in student details menu previously. If the face is recognized, live attendance will be displayed in the form of report. After the live attendance, number of individuals will be determined and displayed. All the information of student will be available in the Student information. Selecting any date from the Report and showing separate day's participation. We can also export attendance in a csv format.

- User Interface – We have assembled a decent User Interface for login and for a portion of the Home page menu's live andrecording which is clear and proficient
- Login page: where an administrator needs to enter a username and secret word.
- Home page: Page where there are numerous menus like recorded, student details, take attendance, view attendance
- Detection of Faces: We utilized Haar Cascade Algorithm for object identification utilizing datasets. It's anything but anobject Detection Algorithm used to recognize faces in a picture or a constant video.
- Live Camera displaying: Clicking Recorded menu in Home page will show live camera.
- After recognition of images, the details will be displayed in report.
- Report is present on the right side of the page.
- Exporting can be done, which results in generation of csv file

VII. ALGORITHM IMPLEMENTATION

Haar Cascade Algorithm is an Object Detection Algorithm used to distinguish faces in a picture or a constant video. Calculation is given with a great deal of positive images comprising counts, and a negative image not comprising of any face to prepare on them. The model made from this preparation is accessible at the OpenCV.

Haar Cascade classifiers are a viable way for object detection. Haar Cascade is an AI based methodology where a great deal of positive and negative pictures are utilized to prepare the classifier. Then, at that point we need to separate highlights from it. For this, Haar highlights displayed in the beneath picture are utilized. They are actually similar to our convolutional portion. Each component is a solitary worth acquired by taking away amount of pixels under the white square shape from amount of pixels under the dark square shape. Cascading classifiers have been trained with several "positive" and arbitrary "negative" sample views of a particular object and images of the same size. After the classifier is done with training, it can be applied to one of the region of an image and detect the object. The search window can be moved across the image and check every region for the classifier to search for the object in the entire frame.

VIII. SNAPSHOTS OF OUTPUT

Figure 3: Login Page

The login page in the figure 3 shows that the administrator with the substantial username and password can effectively login and once the login is successful it straightforwardly moves to the home page. Assuming the login is unsuccessful, it will not move to the home page
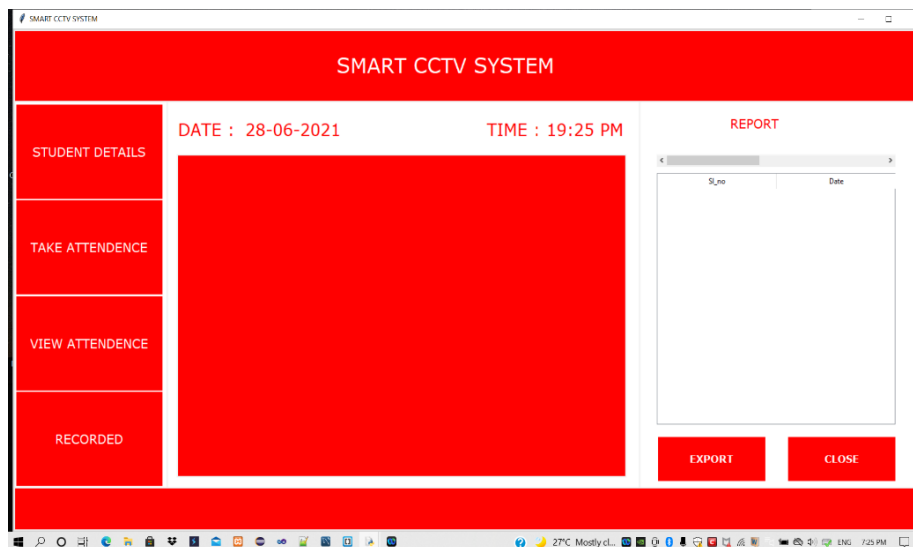
Figure 4: Home page

This is the Home page in figure 4 where we can have numerous menus like student details, view attendance, take attendanceand recorded choices. It is likewise going to have specific days date and time showing in the home page.
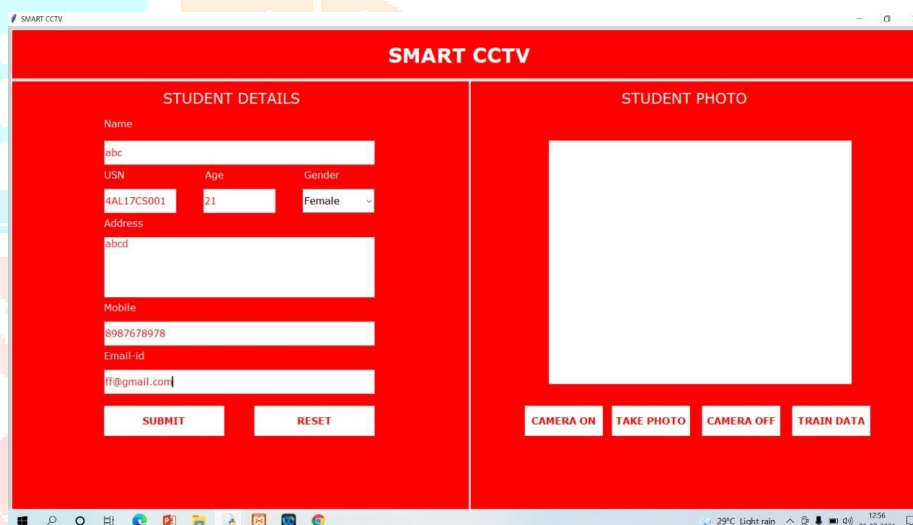

Figure 5: Entering student data

In this figure 5 all the necessary field of student data is entered. Every one of these data will be stored in the database.
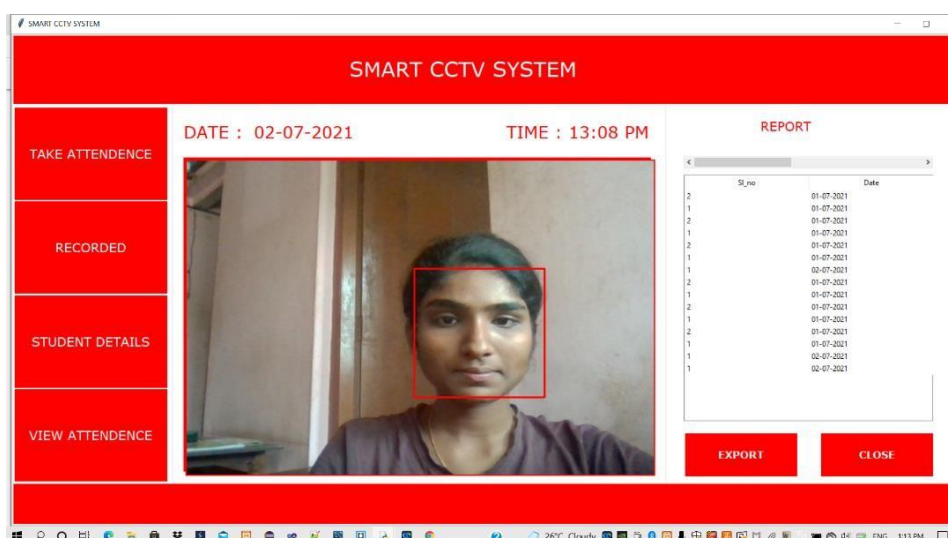

Figure 6: Face Detection

In this figure 6 the face will be recognized and detection will happen here. In the right half of the page we can see the report where all the data of the identified individual will be produced in this report. There is a choice called export in the event that we click on that alternative we can get a report in a CSV file.

Figure 7: Regular report

we will get that specific day's report. Attendance can be easily observed here. We can see any particular day's attendance.

IX. CONCLUSION

Monitoring student's attendance stays the crucial and imperative piece of any educational foundation. The attendance of students to classes can affect their scholarly exhibition. With the continuous expansion in the quantity of understudies, it turns into a test for foundations to deal with their attendance. The customary participation observing framework requires extensive measure of time because of manual account of names and dissemination of the paper- based attendance sheet for understudies to sign their names. The paper-based attendance recording technique and some current computerized frameworks like versatile applications, Radio Frequency Identification, Bluetooth, and unique mark attendance modelsare inclined to counterfeit outcomes and time squandering. Consequently, this paper proposes a attendance checking framework in education foundation utilizing smart cctv which will be useful for the organization where time will be saved and manual work will be extremely less. Here we will have a right outcome with the good precision rate.

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