STUDENTS SURVEILLANCE SYSTEM IN MASS GATHERING USING DEEP LEARNING

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Abstract - *ID cards of students in schools and colleges provide a quick visual way to determine if a student belongs to that particular college or not. Making sure the IDs are worn prominently will ensure people who don't belong are spotted quickly. Thus, it is important to ensure that all the students wear ID cards inside the campus. The project proposes a system to monitor the wearing of ID cards using computer vision with object detection. To facilitate object detection in a college environment, the proposed work identifies the presence of a student wearing an ID card or not, by comparing it with the database containing pre-stored images. Once the absence of an ID card is detected, the student's face will be recognized and compared with the faces that are stored in the database to find out the student who is not wearing an ID card. This is achieved using the face detection and face recognition concepts. Further, the image captured is mailed to the student and management through IMAP protocol.*

Key Words: **ID card, computer vision, object detection, face recognition, face detection, IMAP protocol**

1. INTRODUCTION

In recent years, there has been a significant increase in public awareness in the region regarding college security and safety. Campus violence has risen sharply at all levels of education. This violence is perpetrated not only by external powers, but also by internal forces. This rise is connected to students, parents, and even faculty, and more and more communities are recognising the need to act. To combat brutality and illegal entry to the college campus, some groups have chosen to step in one of two ways. An ID card system is a low-cost solution that can improve security without being challenging or time-consuming to implement. The introduction of low-cost wireless technologies has made access control hardware installation much simpler and more cost-effective. Also on older campuses where access and ID systems have been in place for years, newer systems are being introduced that are easier to use and more efficient in their service ID cards can be a big move in the right direction if your campus presently employs an electronic access and ID system or is looking to enhance its overall security measures by integrating one.

Students who are currently enrolled can be easily identified from those who are not, who are from another campus, or who have had certain access privileges revoked with ID cards. Active students have easy access to the buildings, locker rooms, libraries, cafeterias, auditorium, parking areas, and other facilities while non-enrolled students do not. Having an ID card that is worn at all times can also help security and resource staff identify individuals that are not currently permitted to be at the college so they can be addressed appropriately, effectively, and most of all quickly.

2. LITERATURE SURVEY

The literature survey is accomplished by reviewing several papers and connecting all in this paper.

An ideology of "Face Recognition-Based Mobile Automatic Classroom Attendance Management System" [1] explains the function of contributing factor to student participation and the final success that does not require any additional equipment. The method of "An Efficient Face Detection Method Using Adaboost and Facial Parts" [2] is to compare and contrast various face detection and recognition approaches, and to provide a complete solution for image-based face detection and recognition with higher accuracy. The paper "Colour Attributes for Object Detection" [3] explains about the colour knowledge which is expanded in two existing methods for object detection, the part-based detection system and the Efficient Sub window Search approach which describes the colour impulse for Object Detection. An article "Combined AdaBoost and gradient faces for face detection under illumination problems" [4] explains a face detection under illumination problems that makes use of local sparse structure in convolutional vision network that leads to optimum results. The proposed approach "Template Match Object Detection for Inertial Navigation Systems" [5] uses the image processing technique to enhance the INS's precision in detecting and tracking ground objects from flying vehicles. A method "Shape Matching and Object Recognition using Low Distortion Correspondences" [6] describes that the algorithm converts correspondence into

an integer quadratic programming problem and displays results for localizing frontal and profile faces that are comparable to special purpose approaches tailored to faces An article "A general review of human face detection including a study of neural networks and Haar feature-based cascade classifier in face detection" [7] explains the face detection algorithms are used to determine whether or not there are any faces in an image.

3. PROPOSED SYSTEM

The proposed system is featured with real-time for continuous monitoring. The monitoring process would include all of the students on campus. The light and the object's viewpoint are two of the most difficult problems that computer vision has to deal with. Regarding this, the concept of deep learning through the use of Neural Networks on detecting and recognising objects have shown a high degree of accuracy and precision on these tasks. In this system, the ID cards are detected and recognized using object detection algorithms.

3.1 Block Diagram

As shown in fig-1, the block diagram of the proposed system consists of two major blocks. The primary block is a part of recognition system that is used to recognize and detect faces. This is accomplished using the Open CV software library, which is confined to python programming. It uses You Only Look Once (YOLO) algorithm of Convolution Neural Networks stream. The secondary block is a part of a computer system in which a face- featured database is used as the back end functionalities to retrieve information about an identified face.
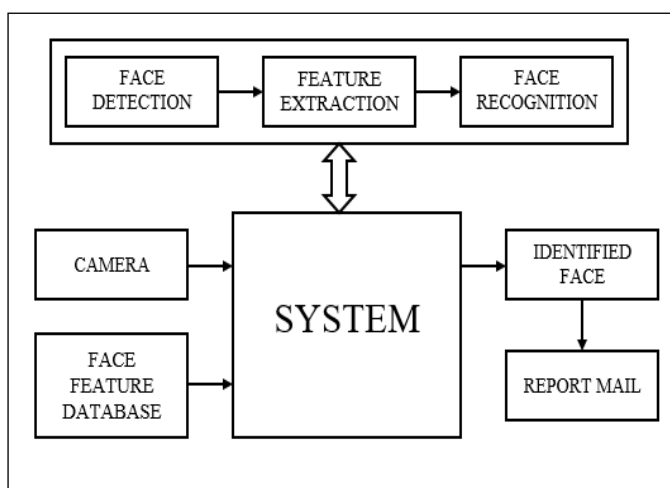

Fig -1: Block diagram of the Proposed System

4. WORKING PRINCIPLE

The working of the proposed system is shown in the flowchart. Fig -2 explains the overall working process of the system.
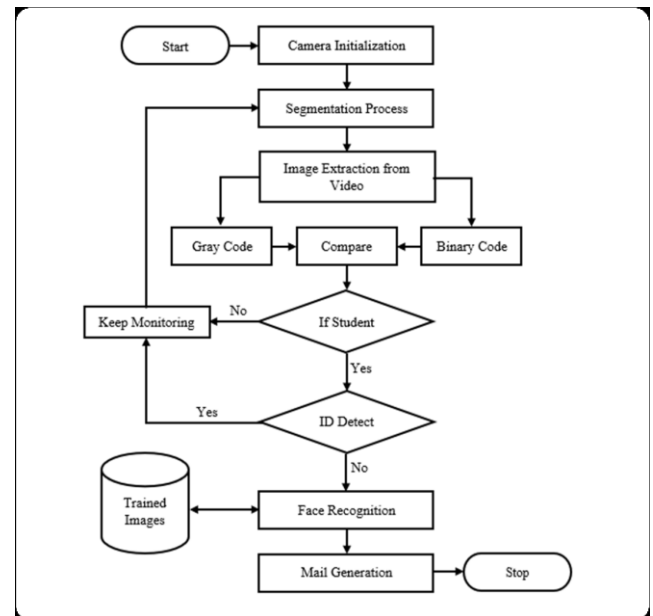

Fig -2: Flow Chart of the Proposed System

The flowchart represents the student surveillance system's sequential flow. The method of segmenting an image into several segments is known as image segmentation. Based on these segments the faces are differentiated and identified. The system first identifies the student who didn't worn the ID card. The comparison between grey and binary codes is the major part of this recognition. Gray code is a binary numeral system ordering in which two successive values differ by only one bit and compared with the with the binary codes which consists of pixels that can have one of exactly two colors either black or white extracted from the captured image. If it found the student indiscipline automatically flows to the process of detecting and recognizing the face of the concern student. The detected student's details will be fetched from the database. Then, the details of the student along with the image captured when the student didn't worn the ID card will send to the student and management through mail.

Initially the GUI window opens first in which the user must enter their login credentials in this GUI window. When a student is identified not wearing an ID card, the picture of the concerned student is taken and emailed to the appropriate staff via the IMAP Protocol.

Students who do not have an ID card will be identified using face recognition technology and will be paid a fine. The size of the fine will increase as the number of times the student

appears on campus without an ID card increases. It ensures a high degree of precision in detection across the campus. It immediately informs the authorities so that strict disciplinary measures can be implemented in college.

The two windows depicts the project main windows. These are the windows that are managed by the college's administration.
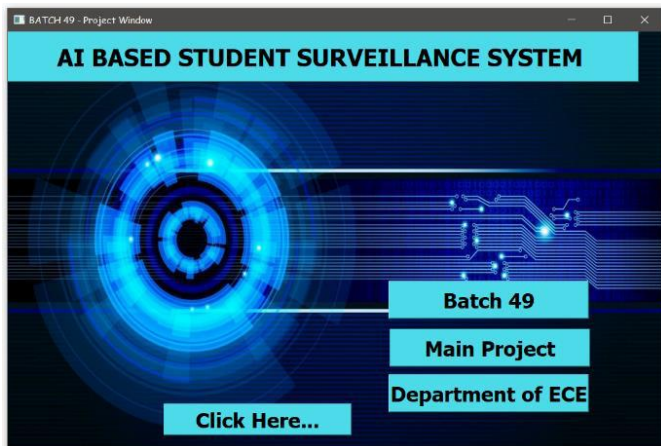

Fig -3: Main project GUI window

In the Fig -3 displays the main project GUI window, which appears when the surveillance system is turned on.

Fig -4: Staff login page

In fig -4 it portrays the staff login window, which is considered to be very confidential. The surveillance camera will be switched on after logging into the page to observe the students.

According to the system, now the campus is under the surveillance. The following two possible outputs will be generated:

1. Student with ID card

2. Student without ID card

4. RESULT AND DISCUSSION

A system that is used for student surveillance is developed and the experimental results of the systems are verified. Thus, effective monitoring of students in mass gathering is done with the system.

The below two figures depicts the output window of the developed system.

**Fig -5**: Output Window – Student Wearing ID card

The Fig –5 depicts the performance window in the event that a student is identified wearing an ID that has been captured by surveillance. Using object recognition, it first detects the student, then uses the trained image to identify the ID card. The student and ID card are then automatically bounded by green rectangular box individually.

Fig -6: Output Window – Student Not Wearing ID card

In the above Fig-6 the surveillance camera is recognizing the student and the ID card. Since the student has not worn his or her ID card, it begins to identify and detect the face of the

same student who has not worn his or her ID card, and based on the information stored in the database, it will be shown in the output window. With the name of the concerned student, the face has now been identified.
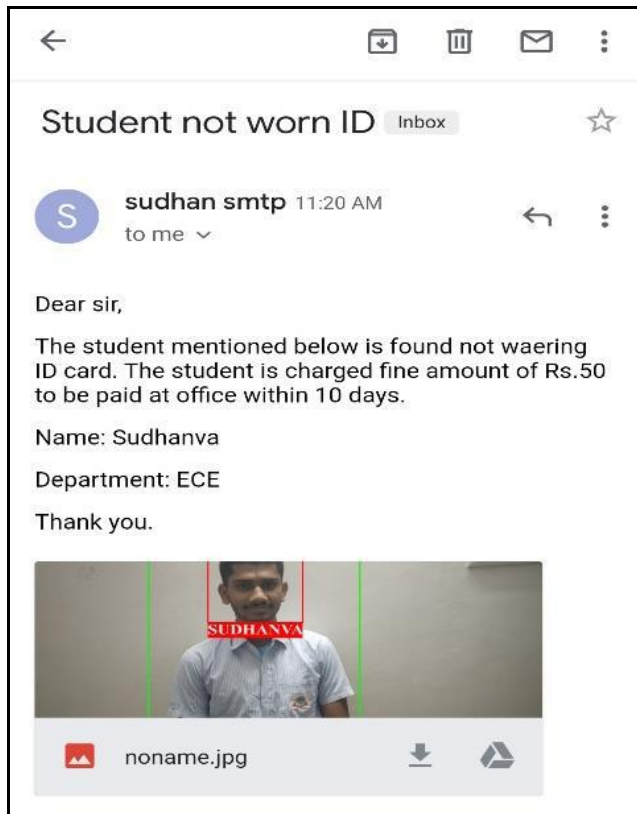
Fig -7: Mail generation

In the Fig-7 the image of the detected student will be captured, and the student's information, as well as the fine number, will be attached to a mail and sent to the management and the appropriate student.

5. CONCLUSIONS

We have proposed an artificial intelligence based college ID card detection using object detection algorithm. In our system will detect faces from the classroom and detect the ID wearing or not by feature extraction and matching by using machine learning techniques. We implemented facial landmark and object detection algorithm and evaluated the performance. Our results showed that the detection is accurately carried out of the faces of students wearing an ID card in the campus.

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