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AUTOMATIC ATTENDANCE SYSTEM THROUGH FACE RECOGNITION

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Abstract — In this paper, Now-a-days attendance is the major process that can be done in any educational institutions, and it is a time taking process for every educator in a piece of paper. In this project we take the attendance by recognizing the face of the students and mark the attendance in a excel sheet with the date and time and if the person absent for the class, then the message will be sent to parent telegram id, so that we can save the time and the records of student data and details of student will be stored in a particular location or in a particular file. This research is aimed to develop less intrusive, cost effective and most efficient as automatic attendance system through face recognition using Machine learning with Python.

INTRODUCTION

The human face is a unique representation of individual identity. Thus, face recognition is defined as a biometric method in which identification of an individual is performed by comparing real time capture image with stored images in the database of that person. Face recognition is crucial in daily life in order to identify family, friends or someone we are familiar with We might not perceive that several steps have actually taken in order to identify human faces Human intelligence allows us to receive information and interpret the information in the recognition process. We receive information through the image projected into our eyes, by specifically retina in the form of light. Light is a form of electromagnetic waves which are radiated from a source onto an object and projected to human vision. Robinson-Riegler, G., & Robinson Riegler, B. (2008) mentioned that after visual processing done by the human visual system, we actually classify shape, size, contour and the texture of the object in order to analyze the information. The analyzed information will be compared to other representations of objects or face that exist in our memory to recognize. In fact, it is a hard challenge to build an automated system to have the same capability as a human to recognize faces. However, we need large memory to recognize different faces, for example, in the

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Universities, there are a lot of students with different race and gender, it is impossible to remember every face of the individual without making mistakes. In order to overcome human limitations, computers with almost limitless memory, high processing speed and power are used in face recognition systems.

PROPOSED SYSTEM

In the existing system, the college has to manually maintain the information regarding the student attendance. This involves a lot of man-work be it either writing by hand or storing it in MS Excel file on a computer.

Maintenance of these attendance sheets is very difficult as they have to be arranged in a particular order be it by the register number of the student or by academic year. Retrieval and updating information are tedious tasks. Sometimes the files might get lost or damaged which leads to loss in data as there might be no back-ups. This burdens them as there is a lot of data to work on.

So, this system of student attendance management system is proposed for ease of the management staff and student.

LIMITATIONS

- Time consuming.
- Need more manpower.
- Difficult to handle.
- Difficult to update data.
- Difficult to search a specific student's record.

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PROPOSED SYSTEM & ITS ADVANTAGES

The methodology that used in this project is Haar Cascade classifier and LBPH algorithms: At first it resizes the image where the original image that we have considered is very large after classifying or resizing of images it loads the image and convert it into a gray-scale images the reason for this gray channel is easy to process and it is computationally less intensive as it contains only one channel of black-and-white. After converting RGB image to gray we further classifies or extract features of face using face classifier and using in built function to detect multiple faces.

The another algorithm used for this project is LBPH (Local binary pattern histogram): It actually done by 2 methods:

1) Face recognition: It recognizes the facial images which are already resized and converted to gray scale image.

2) Face detection: It is used to find the face

Verification: It basically compares the input facial image with the facial image related to the user which is requiring the authentication.

Identification: It basically compares the input facial image with all facial images from a dataset.

ADVANTAGES

- Consumes less time.
- Minimal manpower.
- Paper-less management.
- Hassle free.
- Easy to maintain.
- High Security.

LITERATURE SURVEY

1.Automatic Face Detection and Recognition for Attendance Management

- Proposed in 2020, By Jayadev Madhavan and his group
- This project is based on Deep Learning.
- For face detection they have used YOLO v3 and MTCNN models with denoise and quality check methods.

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- Noises encountered while processing an image are : pose, angle, facial expression, light conditions, size of faces in an image, occlusions.
- This gives better accuracy , but performance was reduced. Takes a huge amount of time to run.

2. Face Recognition Based Attendance Monitoring System

Proposed in 2019, By Omkar Balaji Biradar, Anurag Shashank Bhave In this project they have used Raspberry – pi and OpenCV.

The algorithm used is Haar Cascade.

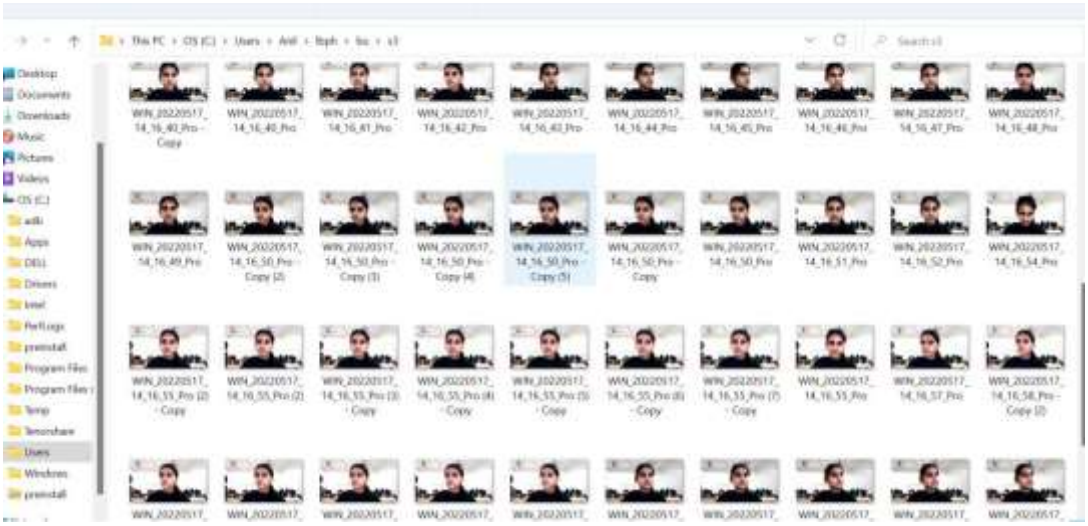
They have written a separate code for data generation and for face recognition, hence detected face will be taken, and the by applying Haar based cascade feature, a threshold value is calculated to check the similarity.

Disadvantages were, the Raspberry-pi used is high cost and we cannot guarantee its working, a high- resolution camera is needed, image quality is necessary for face detection.

3.Automatic Attendance Management System using Face Detection

- In this project they have used Eigen Faces algorithm for face Detection.
- Eyeball is detected using eyeball sensor which senses blinking of an eye and locates the iris, if iris is recognized attendance is marked.
- Software used - OpenCV, NumPy.
- Disadvantage was it takes lot of time for detecting eyeball.

RELATED WORK



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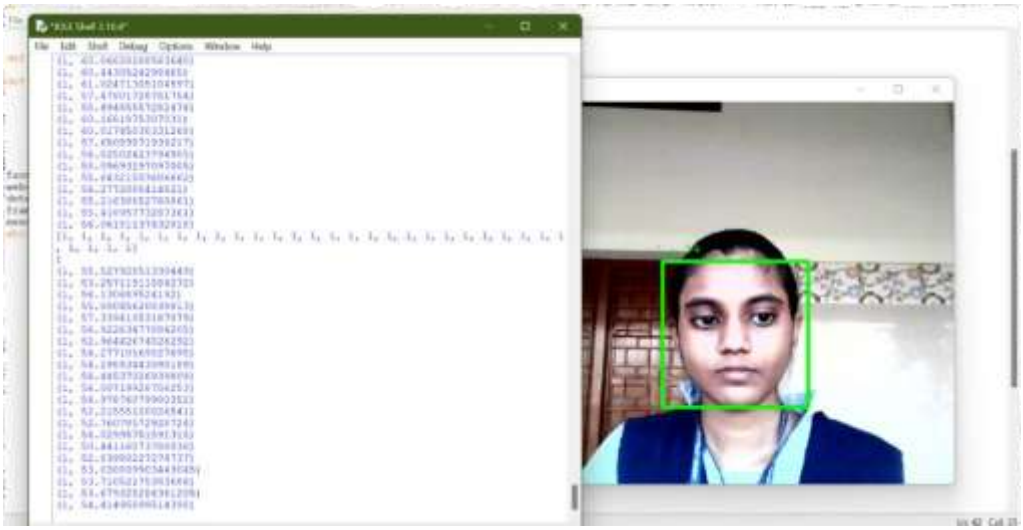

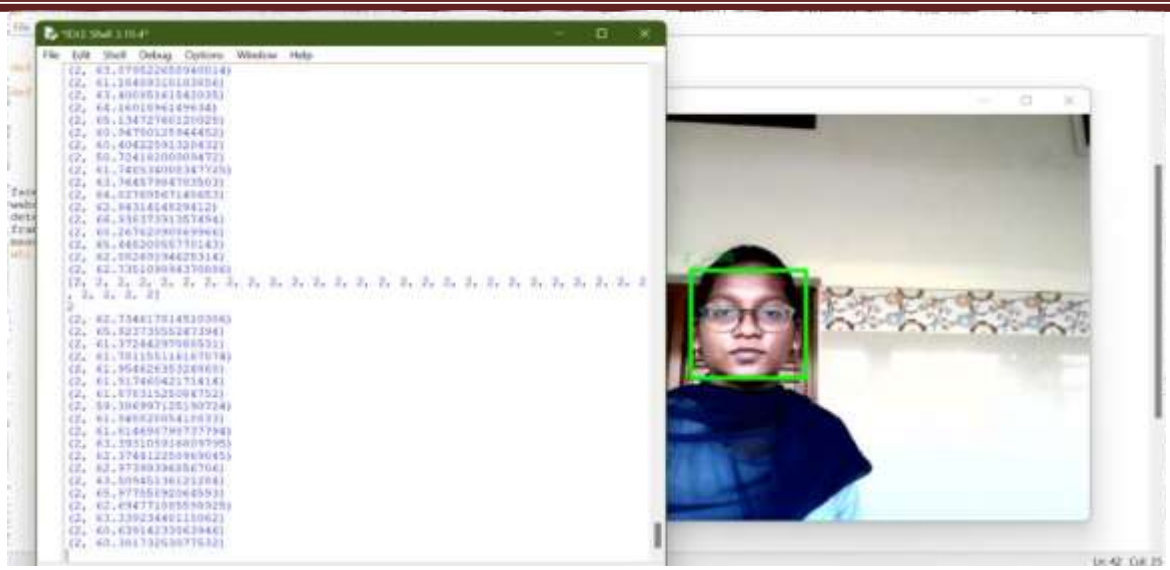

CONCLUSION

In this paper, Finally, in the student attendance management system, the outcome of all the hard work done for attendance management system is here. It is software that helps the user to work with the endance, fees update, course update, and messages, etc. This software reduces the amount of manual data entry and gives greater efficiency.

The User Interface of it is very friendly and can be easily used by anyone. It also decreases the amount of time taken to write details and other modules. All the details about students, teachers, and their other tasks can only be seen by the verified users. This Attendance Management System is a solution to all the problems related to the attendance, message, fee status, courses taken by the teachers and the students, etc.

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In the end, we can say that this software is performing all the tasks accurately and is doing the work for which it is made and this system can be implemented in N number of colleges and schools.

To conclude, Project Data Grid works like a component which can access all the databases and picks up different functions. It overcomes the many limitations incorporated in the attendance.

- Easy implementation Environment
- Generate report Flexibly

The Attendance Management System is developed using fully meets the objectives of the system which it has been developed. The system has reached a steady state where all bugs have been eliminated. The system is operated at a high level of efficiency and all the teachers and user associated with the system understands its advantage. The system solves the problem. It was intended to solve as requirement specification.

FUTURESCOPE

It can be easily implemented at any institute or organization.

A method could be proposed to illustrate robustness against the variations that is, in near future we could build a system which would be robust and would work in undesirable conditions too. Here it is proposed for an institute to take the attendance of the students but in future it can be used to do the same work at entry as well as exit points.

I am working to improve the face recognition effectiveness to build more efficient systems in near future. In further work, authors intend to improve face recognition effectiveness by using the interaction among our system, the users and the administrators. On the other hand, our system can be used in a completely new dimension of face recognition application, mobile based face recognition, which can be an aid for common people to know about any person being photographed by cell phone camera including proper authorization for accessing a centralized database.

- Camera Access by mobile Camera rather Web cam.
- Get an ID card with name, class, ID, Barcode and Photo on it.
- Student can access his/her attendance dates individually to his Email account.
- More Authority to the Admin like, add or remove Faculty, update student details etc.

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- More information can be stored of students like Email ID, Address, Phone No etc.
- Semester and Class wise access to Faculty.

More than one Faculty can Access the Application

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