**Abstract**:

The face is the most important part of the human body because it uniquely identifies a person. Face recognition systems can be implemented by using facial characteristics as biometrics. Attendance tracking is the most difficult task in any organisation. Teachers call out students in the traditional attendance system, and their presence or absence is recorded. Traditional techniques, on the other hand, are time-consuming and labor-intensive. The Open CV-based face recognition approach has been proposed in this project. This model combines a camera that captures an input image, an algorithm for detecting faces in input images, encoding and identifying the faces, marking the stem. Attendance in a spreadsheet, and converting it to a PDF file. The training database is built by instructing

INTRODUCTION

Educational institutions nowadays are

Concerned about the consistency of student attendance This is primarily due to the fact that a student’s overall academic performance is influenced by his or her attendance at the institute. Calling out the roll call or having students sign on paper are the two most common ways of recording attendance. They were both more time consuming and challenging. As a result, a computer-based student attendance management system is required to assist faculty in maintaining attendance records automatically.

In this paper, we used PYTHON to implement an automated attendance system. We have planned to put our ideas into action “Fully automated. Facial Recognition-Based Attendance System “, in which it imbibes a wide range of applications. The application includes face recognition, which saves time and eliminates the possibility of proxies.

Authorization. As a result, this system can be used in a field where attendance is critical. The system is built on the PYTHON platform. The proposed system employs the eigenface-based Principal Component Analysis (PCA) algorithm. This algorithm compares the test and training images to determine which students are present and which are not. The attendance record is kept in an excel sheet that is automatically updated.

Every school, college, and university keeps track of every student’s attendance. There is a significant correlation between students’ attendance and their academic performance, according to empirical evidence. There was also a claim that students with poor attendance records will generally have poor retention. As a result, faculty must maintain properFace recognition can be used to solve a wide range of problems, including image and film processing, human-computer interaction, criminal identification, and so on. This has inspired researchers to create computational models for identifying faces, which are relatively simple and easy to implement. The current system represents some face space with higher dimensionality, but it is also ineffective. The important point to remember is that, while these face images appear to have a high dimensionality, they actually span a very low dimensional space. SoIt is preferable to consider only a subspace with lower dimensionality to represent this face space rather than the entire face space with high dimensionality. The goal is to implement the system (model) for a specific face and distinguish it from a large number of stored faces while also incorporating some real-time variations. The Eigenface method recognises images using the Principal Component Analysis (PCA) algorithm. It provides an efficient method for locating lower-dimensional space.

LITERATURE REVIEW

“Eigenfaces for Recognition” (Mathew Turkand Alex Pentland) 111, they have developed a near-real time computer system that can locate and track a subject’s head, and then recognise the subject by comparing facial characteristics to those of known individuals. This system’s amputational approach is motivated by both physiology and information theory, as well as the practical requirements of near-real time performance and accuracy. This approach treats the face recognition problem as an intrinsically two-dimensional recognition problem rather than requiring the recovery of three-dimensional geometry, leveraging the fact that these faces are normally upright and can be described by a small set of two-dimensional characteristic views. Their experiments demonstrate that the eigentace technique can be made to work.may not be related to general facial features like eyes, nose, and lip For image recognition, the eigentace method employs PCA. The system works by projecting a pre-extracted face image onto a set of face spaces with significant differences between known face images. After imitating it with the current database, the face will be classified as known or unknown. Based on the results, it was determined that approximately 10% of the eigenlaces with the highest eigenvalues are sufficient for recognition. It is also clear that the recognition rate rises as the amber of training images increases.

PROPOSED SYSTEM

The current system of attendance marking, which involves the faculty manually calling out the roll call, has served the purpose admirably. With the introduction of new tachoologies in the classroom, such as virtual classrooms, the traditional method of taking attendance may no longer be viable. Even with the growing number of courses offered by universities, manually processing attendance can be time consuming. As a result, our project aims to develop a system for taking attendance in classrooms using facial recognition technology, as well as an efficient database to record them.Figure I shows a block diagram of the proposed system for a Face Recognition-based Classroom Attendance System. The system requires a camera installed in the classroom in a position where it can capture all of the students in the classroom and effectively care for their images.

Specifications & Requirements System Applicability

We are preparing to design a system made up of two modules. The first module (face detector) is an I mobde component that functions essentially as a camera.Face detection algorithms and face extraction techniques are used in this application to capture student faces and store them in a file using a computer vision face system. The second module is a desktop application that performs face recognition on the captured images in the file, registers the students, and then stores the results in a database for future analysis.

Objective of the System

The primary goal of this project is to provide a system that uses face recognition technology to simplify and automate the process of recording and tracking student attendance. It is biometric technology that is used to identify or verify a pension based on a digital image or surveillance video.

System Design

Design input The input design connects the information system and the user. It includes developing specifications and procedures for ilata preparation, as well as the steps required to convert transaction data into a usable format for processing. This can be accomplished by inspecting the computer to read data from a written or printed document, or by having people enter the data directly into the system. Input design is concerned with controlling the amount of input required. Controlling errors, avoiding delays, avoiding extra steps, and keeping the process simple are all important. The input is designed in such a way that it provides security and convenience while maintaining privacy. Input Design took into account

OBJECTIVES

1. Input Design is the process of converting a piece of data into a usable format.is achieved by creating user-friendly screens for the data entry to handle large volume of data. The goal of designing imput is to make data entry easier and to be free home erors. The data entry screen is designed in such a way that all the data manipulate can be performed. It also provides recond viewing facilities
2. When the data is entered it will check for its yalidity, Data can be entered with the help of Sens. Appropriate messages are provided whe needed so that the user will not be in mare of instant. Thus the objective of input design is to catur an input layout that is my to follow

User-friendly description of a user’s input into a

A computerised system. This is an important design.

As a result, avoid ernes in the data inqut process and demonstrate

DESIGN REQUIREMENTS

We used some tools to construct the HFR system; without these tools, it would not have been possible to complete the project. In this section, we will talk about the most important point.

Software implementation:

We made Open CV 3 dependency for python. Open CV is a library with many resources.There are a variety of image processing functions available. This is a very useful freedom in image processing. Even without writing a single line of code, one can achieve the desired result. The library is cross-platform and free for anyone to use under the BSD licence. Some examples of supported functions

Are as follows: Gradient Denvation Computing in Laglacian terms

Limitation of aurs

Hough transforms: detection of fines, segments, circles, and geometrical shapes Equalization, histogram computing, and

Back projection algorithm for object localization

Segmentumon Threshold holding, distance transform detection of foreground/hackground, and watershed segmentation Morphological operations on linear and son linear files Cascade detector for lice, cye.car

Plates Detection and matching of interest points Processing of video: optical flow, background

Image Processing Toolbox:

The Image Processing Toolhos are a set of functions that extend the capabilities of the PYTHON numerical computing environment. The image processing toolbos supports a wide range of image processing operations, including

own M-files, or by combining the toolbos with toolboxes such as the Signal Prog Toolbox and the Wavelet Toolbos. The Image Acquisition Block set is a Simulink interface included with the toulbos aso. This Simulink block set includes a block that allows you to incorporate live video data into a model.

The goal of testing is to discover new eos. Testing is the process of attempting to find every possible flaw or weakness in a work product. It allows you to test the functionality of components, subassemblies, assemblies, and finished products.

RESULTS AND ANALYSIS:

Using all of the functions available to us

increased: we have decided on output in both existing test images and in real time. The screenshots of the unitjun of various functions are provided in the following section. We put the system through its paces with the help of four volunteers. Using camera images to create the test database

Collect Training Dataset:

We create a database of the enrolled students using the Train Database function, which is saved in the folder.

Images of each candidate are stored on the database with the help of four volunteers, as shown in the figure. We can improve accuracy by increasing the number of training images, but this comes at the expense of calculation speed. However, for our application, calculation speed variation will not be an issue because a class period is typically at least one hour long, which is significantly longer than the computation time required by the algorithm.

algorithm. One thing to keep in mind during this process is that the photograph must be taken in ancient lighting, and the foomal face must be clearly visible.For best results, there should be a slight variation in the student's position or expression in each captured image.

Faces are captured efficiently in normal lighting conditions and based on the students' proper sitting posture. The classroom lighting must be kept in good working order. In the event of a blackout, appropriate backup plans must be put in place.

All of the detected faces, as shown in the figure, are cropped and saved to the Test Database folder. The image is read by the next algorithm from this location, and further processing is performed. The path to the folder must be specified precisely. In addition, the names of each of the faces are automatically assigned as numbers. This makes it easier to read the images from the folder.

Face Recognition:

We get the results after feeding cropped facial images into the face recognition algorithm. The image is subjected to the Eigen faces algorithm and compared to the database. Following this process, we get the result shown in the figure.If a person's image is not found in the database, it is simply ignored. However, proper lighting must be maintained to avoid any false detection.

Output in MS Excel:

As a result, we get the output shown below. Following that, we can generate the results in an appropriate format by utilising various functions in the spreadsheet, as shown in Figure 7 4. Using this format as output, we can obtain the following parameters, as shown in the figure. PYTHON's Spreadsheet Link Ex toolbox is used to perform this function.

If a person is present, a l' is assigned to the student's specific field.

The date and tiame are also passed on.

thesheet.

Using this system, we can include any number of students' data, as long as we use a higher quality image apturing device. We discussed how to integrate all of these functions using the Graphical User Interface in this section (GUI). Users benefit from an easy-to-use interface as a result of this.

CONCLUSION:

In this paper, we presented an attendance system for a lecture, section, or laboratory, which allows the lecturer or teaching assistant to track students' attendance. It saves time and effort, especially if the lecture is attended by a large number of students. The Automated Attendance System was designed to address the shortcomings of the traditional (manual) system. This attendance system exemplifies the application of image processing techniques in the classroom. This system can not only help with attendance, but it can also improve an institution's reputation.

REFERENCES:

[1] M. T. a. A. Pentland, "Eigenfaces For

Recognition." Journal of Cognitive Neuroscience, vol. 3, no. 1, 1991. [2] A. V. a. R. Tokas, "Fast Face Recognition Using Eigen Faces," IJRITCC, vol. 2, no. 11, pp. 3615-3618, November 2014.

[3] Paul Viola and Michael J. Jones, "Robust Real-Time Face Detection," International Journal

Computer Vision, vol. 57, no.2, pp. 137-154, May 2004. [4] N. J. M. M. K. a. H. A. Mayank Agarwal, "Face Recognition Using Eigenface aproach," IRCSE, vol. 2, no. 4, pp. 1793- 8201, August 2010.

[5] Vinay Hermath, Ashwini Mayakar, "Face

Recognition Using Eigen Faces and," IACSIT, vol. 2, no.

4, pp. 1793-8201, August 2010.

[6] V. Shehu and A. Dika, "Using Real Time Computer Algorithms in Automatic Attendance Management Systems." IEEE, pp. 397-402, Jun.2010. [7] A.L. Rekha and H. K. Chethan, "Automated Attendance System using face Recognition through Video Surveillance," Int. J. Technol. Res. Eng., vol. 1, no. 11, pp. 1327-1330,2014.

[8] Savitra Paharekari, Chaitali Jadhav, Surabhi Ni langekar, Jitesh Padwal "Automated Attendance System in College Using Face Recognition and NFC "International Journal of Computer Science and Mobile Computing A Monthly Journal of Computer Science and Information Technology ISSN 2320-088X IMPACT FACTOR: 6.017 IJCSMC, Vol.6. Issue.6. June 2017.

[9] Rekha.E, Dr. Ramaprasad.P "An Efficient Auto- mated Attendance Management System based on Eigen Face Recognition "Department of Electrical Engineer- ing, Amity University, Dubai UAE.