RESEARCH ARTICLE OPEN ACCESS

Automated Smart Attendance SystemUsing Face Recognition

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ABSTRACT

The face is the most important part of the human body for recognizing each individual because it contains many important features. There are several widely used techniques for recording someone's presence, including the labor-intensive biometric approach of taking attendance. In order to track student attendance, this study constructs a model to categories each character's face from a taken image using a set of rules, or LBP algorithm. LBP (Local Binary Pattern) is a method that is widely used for picture representation and classification. It was selected because of its resilience to posture and light shifts. The image will be taken by the suggested ASAS (Automated Smart Attendance System) and compared to the image kept in the database. When a student enrolls, the database is updated automatically, adding the student's name and roll number. If the taken image and the image in the database are identical, then ASAS records a person's attendance. The suggested method reduces effort, records daily management activities for each student, and also streamlines the presence marking process.

OBJECTIVE OF THE PROPOSED SYSTEM:

Among a variety of biometric identification techniques, such as fingerprint, DNA, palm print, hand geometry, iris recognition, and retina, face recognition can be regarded as one of the most effective. Face recognition is a form of biometric identification that makes use of the individuality of faces for security. The lengthy process and lack of precision associated with facial recognition utilizing biometric identification are issues. This essay makes suggestions for ways to speed up facial recognition while maintaining accuracy. The proposed machine learning-based facial recognition method was carried out. Multiple faces might be accurately identified using our improved face recognition method.

INTRODUCTION

An image can be enhanced or be given relevant information by using a technique called image processing. It is a type of signal

processing where an image serves as the

The features or characteristics of the picture serve as the output. One of the technologies that is now advancing the fastest and can be incorporated into any cutting-edge applications is image processing [5]. One of the current methods that require time is biometrics, or fingerprint scanning, because the learner must directly input their impressions onto the device [4]. However, compared to other techniques like biometrics, it specifically takes significantly less time to recognize a face [8].[10]. Face Recognition is knowledgeable and competent to categorize or validate a creature.

Face Recognition can identify a creature from a digital image and can classify or validate it.

The many face detection techniques include:

1) Feature Based
2) Knowledge Based
3) Appearance Based
4) Template Matching.

Nothing more than a two-dimensional signal, a picture is. The mathematical function f(x, y), where x and y are the two horizontal and vertical coordinates, defines it. The pixel value of an image at any position is determined by the value of the function f(x, y).

SYSTEM ANALYSIS:

EXISTING SYSTEM:

A new face identification strategy employing colour basis segmentation and input and either an image or morphological operations is given. The existing system is a single face recognition system.

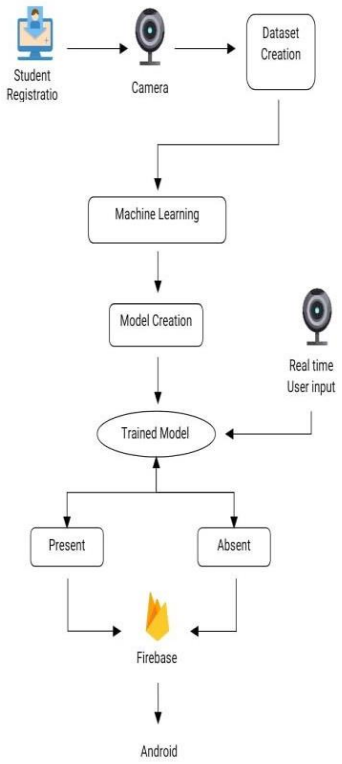
The technique employs morphological operations (such erosion and dilation), background subtraction, thresholding, color plane extraction, and filtering (to prevent false detection). Then, only the face region of the image is detected using particle analysis, leaving out the rest of the body. The performance and accuracy of this approach are subpar. So, we'll relocate the suggested system.

PROPOSED SYSTEM

The suggested method consists of four steps: real-time image training; multiple face detection; comparison of real-time image training with surveillance camera image comparison; and result based on comparison. The video captured by the camera will be transformed into frames in our suggested approach. When a face is found in a frame, it is preprocessed to remove redundant information and minimize noise.

The real-time processed image is compared to the processed images that have previously been saved in the database. If he or she was recognized via the camera, we received a notification from Android via Firebase.

ARCHITECTURE DIAGRAM:



MODULES

- Dataset Collection
- Algorithm
- Detection

MODULE DESCRIPTION:

Dataset Collection:

We use open-CV to get real-time data for our proposed solution. We manually gather data and store it as a dataset. The data will be taught to produce results or identifications with a high degree of accuracy.

Algorithm:

The machine learning algorithm will receive the data after receiving the trained dataset. Data is analysed using a machine learning system. To identify the people, the data will be examined frame by frame in this case. Real-time video is compared to a training dataset.

Detection:

Live video from the open-CV will be used in the detecting procedure. The analysis then begins with the first frame. It begins continuously comparing the presently playing video frame to the training data set. If a student from the register is located, the name, ID, and marked label are displayed on the screen. The detected value is then transmitted to the Android user via Firebase.

HARDWARE AND SOFTWARE SPECIFICATION

HARDWARE REQUIREMENTS

- Hard Disk : 500GB and Above
- RAM : 4GB and Above
- Processor : I3 and Above
- Webcam - 1

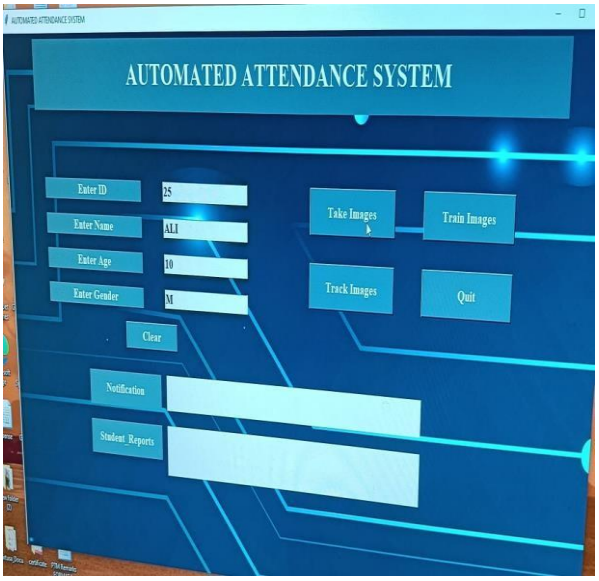
SOFTWARE REQUIREMENTS

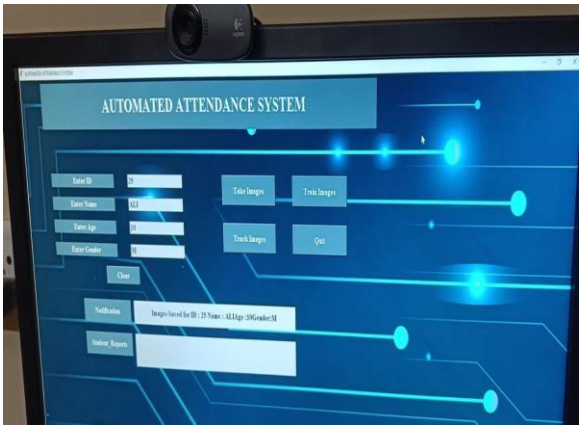
- ✓ Operating System :Windows 10 (64 bit)
- ✓ Software : Python
- ✓ Tools :Anaconda

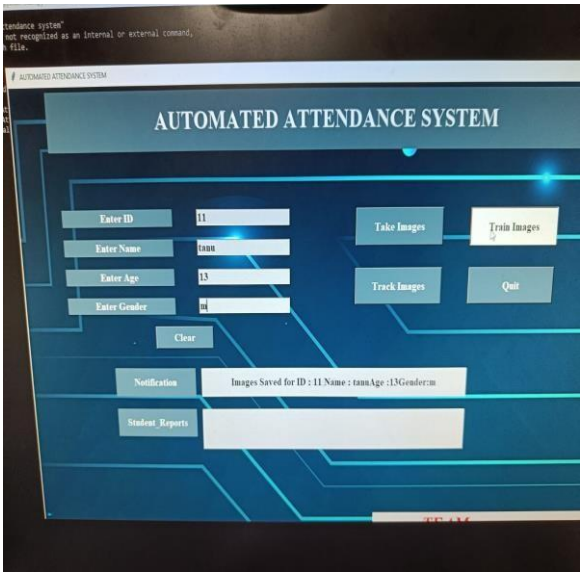
TECHNOLOGIES USED

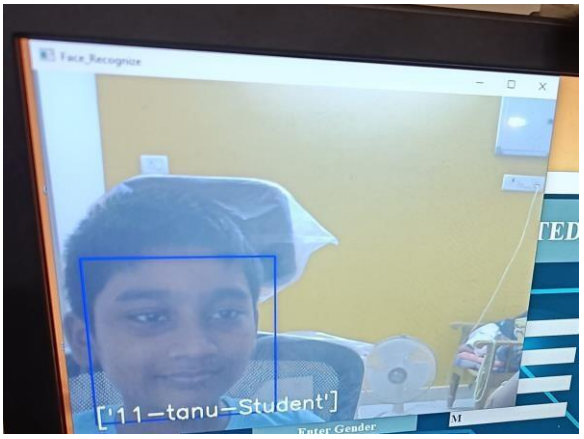
- Python
- Machine Learning

SCREENSHOT









CONCLUSION

We can identify student faces using our model and automatically record their attendance in real time without interference from humans. Therefore, the suggested method makes it possible to identify and recognise faces in a controlled context. For facial identification and detection in a particular area of the surveillance camera, use the LBPH (Local Binary Pattern Histogram). After achieving positive findings from numerous experimental trials of this technique, they also have credible results for pose variance and illumination.This technique processes the entire image in significantly less time.

This project's Future Scope can be expanded to include updating attendance for many individuals.

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