

# USER IDENTITY RECOGNITION SYSTEM USING IMAGE PROCESSING

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## Abstract:

In the era of cloud computing, face recognition, one of the most useful applications of image processing, is essential. Human face recognition is a key issue for verification, especially when it comes to tracking student attendance. The objective of this work is to implement an image processing-based automated system for monitoring attendance to both capture the photos and store the dataset. This classroom camera system recognises faces and logs the information in an excel spreadsheet.

*Keywords: Face recognition, Image Processing, Face Detection, Attendance, Dataset, Excel .*

## I. INTRODUCTION

In all institutions, attendance is the most crucial criterion. Although many universities have their own system for taking attendance, it is a laborious task. The processes are tedious and time-consuming. Although many institutions have their own attendance tracking method, it is a time-consuming operation. Even if they employ automated methods such as biometrics, they must wait for a long time. Other biometrics do not have features that face recognition has.

No extra action is necessary for verification when using facial photographs that can be taken from a distance. To recognize the face, data previously stored in memory is used. It consists of high level

python programming with cv2, csv, face-recognition modules are used in this.

The mounted camera uses databases to identify the individual by their attributes. For the software component of the system, we typically have the Python language. Faces are used as biometric verification in identity verification since they are extremely difficult and variable items[1]. The first segment mostly focused on enhancing the face recognition algorithm, while the second section primarily concentrated on the attendance system based on the identified human faces. The Face-Recognition method LBPH (Local Binary Pattern Histogram) is used to identify a person's face.

## II. LITERATURE REVIEW

A few of the earlier publications include face detection and identification. Face recognition is a

method of using a person's facial to confirm their identity Face recognition algorithms can distinguish people in real time, on camera, or in photographs.

Recognizing faces is the primary goal of face recognition. The few cons are the eigen face technique of recognition creates a feature space that lowers the original data space's dimensionality. The recognition process uses this smaller data area. But the well-known frequent issues with the PCA approach include weak classification performance within the class and extensive computation. This restriction Linear discriminant Analysis overcomes(LDA)[5].

The previous discussions describe the development stages and related technologies of face recognition. For dimensionality reduction and multi-dimensional data visualization, an algorithm is typically utilized[6].

## III. METHODOLOGY

### A. OpenCV:

In most cases, open cv receives data from a webcam or other camera module, processes it, and then passes it to a face recognition module. To handle computer vision issues, OpenCV has a number of tools. It has sophisticated face identification, feature matching, and tracking algorithms. Some of the main image processing techniques are[7]:

1. Image filtering: It is an approach of improving or changing a picture.
2. Image transformation: Simple arithmetic operations are used to the picture data in basic image transformations.

3. Object tracking: The practice of identifying an object (or several objects) throughout a series of photos is called object tracking.
4. Feature Detection: Finding certain visual characteristics, such as lines, edges, or angles, is a technique known as feature detection.

B. **Face recognition:** In the fields of object identification, digital image processing, and pattern recognition, face recognition has proven a tough challenge. A technique called face recognition identifies a specific image from legitimate recorded image or live stream[8].

Face detection is the first step in the suggested procedure. Haar-cascade classifier is one of the most effective face detectors in regards to speed and dependability. To create new Haar-cascades, the training is necessary[8]. The classifier decides how to categorise a picture using an xml file[7].

### c. CSV:

A CSV file, sometimes known as a plain text file, is a format for organising tabular data according to a certain structure. It can only store text data (readable ASCII) as it is a simple text file.

Important data, such customer, is often imported and exported to and from your data using CSV files. A more real-world illustration of this would be an online store that purchases consumer information from a social media platform. This is mostly utilized to manage CSV files and assists with updating, generating, etc.

|   | A       | B  | C             |
|---|---------|----|---------------|
| 1 | name    | id | favorite food |
| 2 | quincy  |    | 1 hot dogs    |
| 3 | beau    |    | 2 cereal      |
| 4 | abbey   |    | 3 pizza       |
| 5 | mrugesh |    | 4 ice cream   |

Figure 2: Dataset

**d. OS module:**

The Python OS module allows the user to interact with the interface. The OS module provides numerous helpful functions that make it possible to obtain a lot of information. There are variety of paths and ways in the OS module.

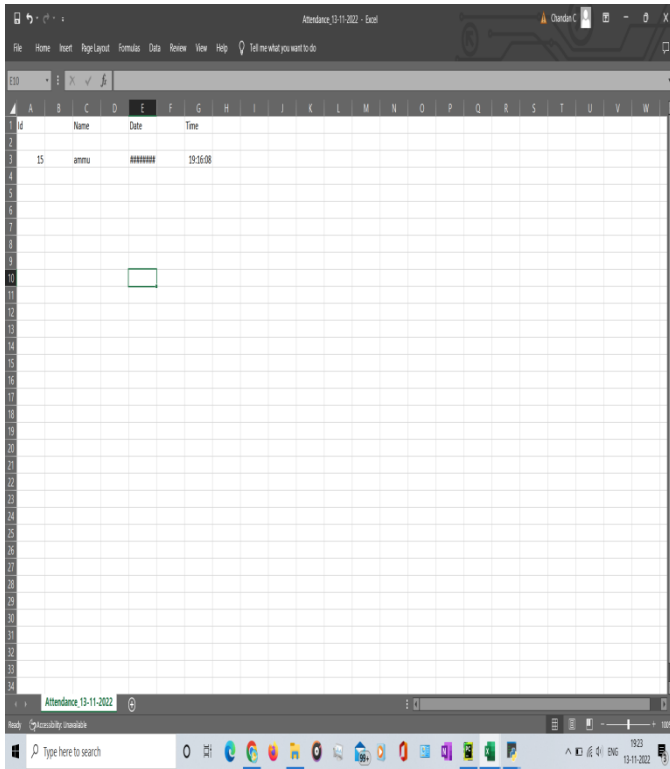


Figure 3: Database

**IV. IMPLEMENTATION**

When it sensors detect the face by utilizing the webcam using cv2, it processes and transmits to the face recognition.

```
Video_capture = cv2.VideoCapture(0)
```

#It takes input from the external camera module.

Then it moves on to face recognition, where it analyses and detects faces previously recorded in databases. The CSV module then updates attendance and allows access to the files. We aim to

apply our facial recognition system to a collection of data of institute students' faces, for whom the attendance system will be created [9].

In this example, faces are identified using OpenCV and the Haar-Cascade Classifier. The Haar-Cascade algorithm has to be trained to identify human faces before it can be used for face detection. Feature extraction is the term for this.

The face system utilizes the face by examining each component of the picture. Many machine learning and pattern recognition-based face identification approaches have been presented [8].

**V. RESULTS**

We must nurture ourselves in accordance with technology as it develops. In the end, we will be able to more precisely track attendance while also saving time and labour. Instead of keeping a register for each part and each lecturer to record attendance, we can save a tonne of paper by employing this gadget. This technology also saves time on taking attendance (for each day in school and each period in college).

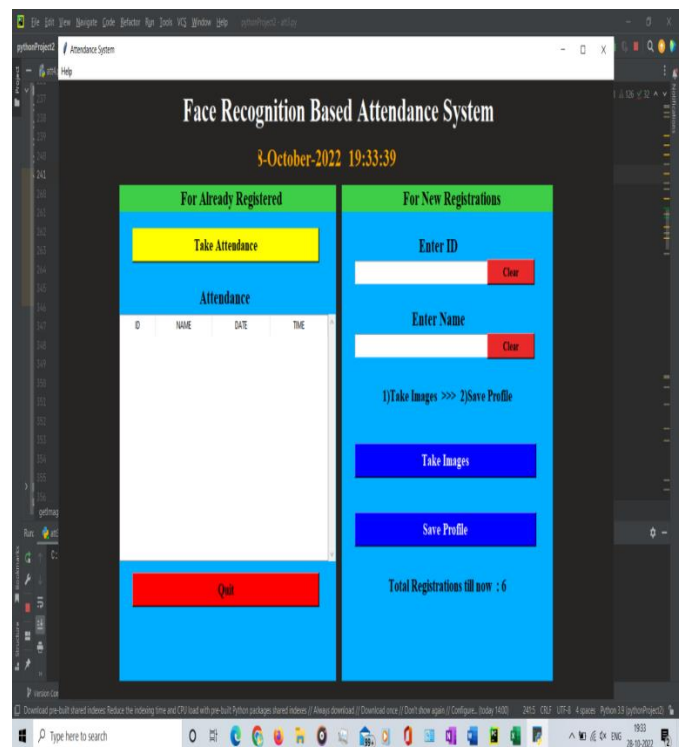


Figure 1: Dashboard of System



Figure4: Face recognition using Keras

Speaking of the main benefit, this gadget greatly benefits from adopting the most recent technology to lessen the work involved in collecting attendance. As technology advances, we must also teach

ourselves how to utilise it so that we may benefit from its features and benefits and lessen all the negative effects that result from not using it.

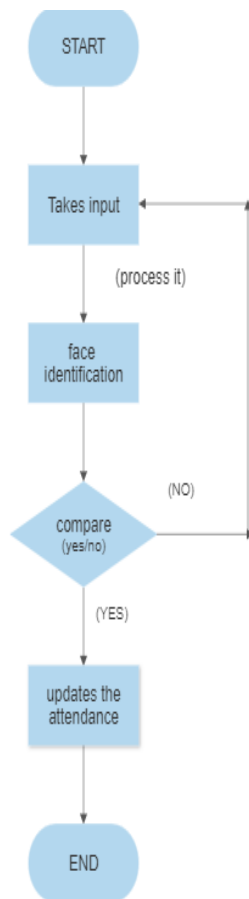


Figure: Process for face identification

## 5. CONCLUSION

The project has vast scope in future as well as the present days too . This keeps the track of a person's daily attendance, working hours, breaks, login and logout times. It prevents the person's time theft. The project can be expanded flexibly in future based on the market requirements. Such implementations are becoming the major step of Development for Digital Revolution as well as Technical Revolution.

Movies have instilled in us a future vision of a time when technology would be able to distinguish people based on their faces. A moment when our faces will serve as our identification cards. That day is here, thanks to the advancement of face recognition technology[11]. Though it was formerly employed primarily for security concerns, as technology advances, it has entered the endeavour technology where it maintains track of the students.

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