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AI BASED FACIAL RECOGNITION ATTENDANCE SYSTEM

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Abstract: Currently, there are a lot of face recognition ways and algorithms plant and developed around the world. Facial recognition becomes an intriguing exploration content. It's proven by multitudinous number of published papers related with facial recognition including facial point birth, facial algorithm advancements, and facial recognition executions. In this design we will try to descry and identify a mortal face and compare it with stored data of known individualities. Our approach recognizes an individuality within a bit of alternate which fully ignores any background effect. It also shows fresh information about that existent. We've enforced our design work using a Python. And this approach utilizes the different libraris lines like OpenCV and numpy. MySQL database operation system is used as the backbone of it's memory.

Index Terms – OprnCV, NumPy, MySQL, Visual Studio, Facial Recognition.

1. INTRODUCTION

Traditional method of attendance marking is a tedious task in many schools and colleges. It is also an extra burden to the faculties who should mark attendance by manually calling the names of students which might take about 5 minutes of entire session. This is time consuming. There are some chances of proxy attendance. Therefore, many institutes started deploying many other techniques for recording attendance like use of Radio Frequency Identification (RFID) , iris recognition, fingerprint recognition, and so on. However, these systems are queue based which might consume more time and are intrusive innature.

Face recognition has set an important biometric feature, which can be easily acquirable and is non-intrusive. Face recognition based systems are relatively oblivious to various facial expression. Face recognition system consists of two categories: verification and face identification. Face verification is an 1:1 matching process, it compares face image against the template face images and whereas is an 1:N problems that compares a query face images . The purpose of this system is to build a attendance system which is based on face recognition techniques. Here face of an individual will be considered for marking attendance. Nowadays, face recognition is gaining more popularity and has been widelyused.

2. LITERATURE REVIEW

2.1 Survey of existing system

- Study1

A Counterpart Approach to Attendance and Feedback System using Machine Learning Techniques-

In this paper, the idea of two technologies namely Student Attendance and Feedback system has been implemented with a machine learning approach. This system automatically detects the student performance and maintains the student's records like attendance and their feedback.

- Study2

Automated Attendance System Using Using Face Recognition -

Automated Attendance System using Face Recognition proposes that the system is based on face detection and recognition algorithms, which is used to automatically detects the student face when he/she enters the class and the system is capable to marks the attendance by recognizing him.

Viola-Jones Algorithm has been used for face detection which detect human face using cascade classifier and PCA algorithm for feature selection and SVM for classification.

- Study3

Implementation of Face Recognition Algorithm for Biometrics Based Time Attendance System –

This research are to get the best facial recognition algorithm (Eigen face and Fisher face) provided by the Open CV2.4.8 by comparing the ROC (Receiver Operating Characteristics) curve and implement it in the attendance system.

2.2 Limitation on existingsystem

- Storage requirements problems
- Vulnerable detection
- While detecting the face , accuracy or time consuming problem.

3. PROBLEM STATEMENT

Taking and tracking students' attendance manually, losing attendance sheets, dishonesty, wasted time and high error scales are problems facing the lecturers use the existing attendance system. It is a hard process, take time and cause a lot of paper-based work. As a result, in order to solve these problems and avoid errors we suggest to computerize this process by providing a system that store and manage students' attendance automatically.

4. PROJECT OBJECTIVES

Our Primary goal is to help the lecturers, improve and organize the process of track and manage student attendance and absenteeism. Additionally, we seek to:

- Reduce manual process errors by provide automated and a reliable attendance system uses face recognition technology.
- Increase privacy and security which student cannot presenting himself or his friend while they are not.
- Flexibility, Lectures capability of editing attendance records.

3. PROPOSED SYSTEM

3.1 Algorithm

This section describes the software algorithm for the system. The algorithm consists of the following steps

- Image acquisition
- Noise removal
- Skin classification
- Face detection
- Face recognition
- Attendance

In the first step image is captured from the camera. There are illumination effects in the captured image because of different lighting conditions and some noise which is to be removed before going to the next steps.

Histogram normalization is used for contrast enhancement in the spatial domain. Median filter is used for removal of noise in the image. There are other techniques like FFT and low pass filter for noise removal and smoothing of the images but median filter gives good results.

Flow and Processing of Algorithm :-

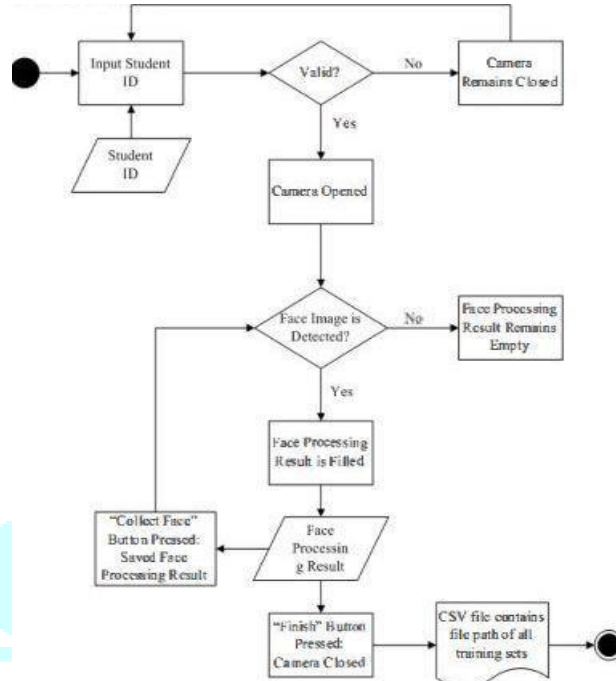


Fig. 1 "Collect Face Data" flowchart

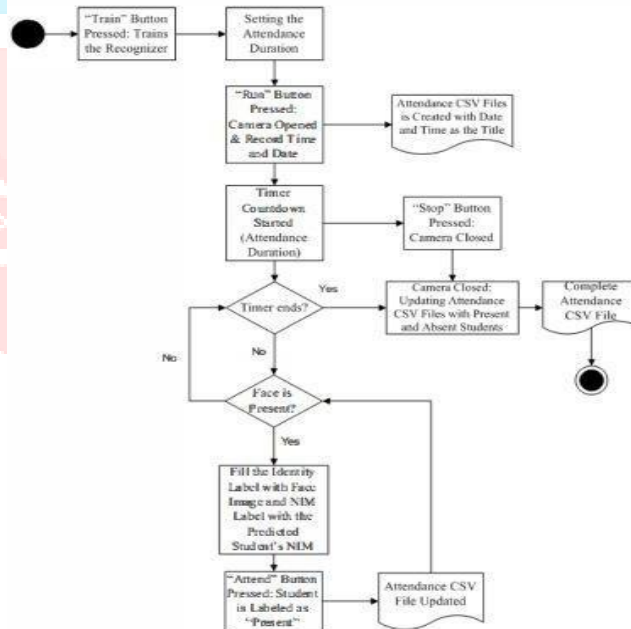


Fig. 2 "Attendance Recognition" flowchart

Software Requirements:

- Webcam
- Python File
- Visual Studio Code
- MySql workbench.

3.2 DesignDetails

We have implementing our project work using a Python . Open source libraries of python like OpenCV and NumPY are used to process the image recognition algorithm and also tkinter is used for Graphics User Interface level with the help of Visual Studio Code application. MySQL database is used to storedata.

The whole working process of the system can be best explained with three segments. These are:

DATA SET –

This segment of the python code is mainly dedicated person's identification data. Basically, it instructs the camera to take 100 sample pictures. And users need to provide information about their Name, age, gender, department etc. This information is stored in MySQL database along with the 100 sample pictures. MySQL database management system

TRAINER CLASSIFIER SEGMENT–

This segment mainly trains the system to be able to identify specific persons. The sample pictures of a person are converted into the grayscale format. This system does not need the color explicitly. Besides, information regarding the color of an image sometimes makes it difficult to identify important edges.

DETECTION-

NumPy is a open source library of python which makes it easier to process the multidimensional matrix . First, the part containing the face is extracted from the full image to reduce the effect of background in image processing and stored in a matrix. Then the matrix is manipulated and compared with the sample photos for identifying any match.

3.3 Methodology

The system is totally built with the help of Python.

1. The open source library we used is OpenCV which mainly aim to processreal-time computervision.
2. NumPy which is a python library for processing multidimensional array is usedto process the still imagefaster.
3. The system has a storage management system which is MySQLdatabase management system is used for data managementpurpose.

4. REVIEW CONCLUSION

In short, we can say that ,the system is totally built with the help of Python. The open source librariy we used is OpenCV which mainly aim to process real-time computer vision.NumPy which is a python library for processing multidimensional array is used to process the still image faster.The system has a storage management system which is MySQL database management system is used for data management purpose.

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