A

Synopsis

on

Face Recognition Attendance System

Submitted by

Yash Raj Singh
(2100290140154)
Sharad Gupta
(2100290140122)

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Under the Supervision of

Dr. Akash Rajak
(Professor)
KIET Group of Institutions

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KIET Group of Institutions,
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ABSTRACT

In colleges, universities, organizations, schools, and offices, taking attendance is one of themost important tasks that must be done on a daily basis. The majority of the time, it is donemanually, such as by calling by name or by roll number. The main goal of this project is tocreate a Face Recognition-based attendance system that will turn this manual process intoan automated one.

This project meets the requirements for bringing modernization to the way attendance is handled, as well as the criteria for time management. This device is installed in the classroom, where and student's information, such as name, roll number, class, sec, and photographs, is trained. The images are extracted using Open CV.

Before the start of the corresponding class, the student can approach the machine, which will begin taking pictures and comparing them to the qualified dataset. Logitech C270 web camera and NVIDIA Jetson Nano Developer kit were used in this project as the camera and processing board. The image is processed as follows: first, faces are identified using a Haarcascade classifier, then faces are recognized using the LBPH (Local Binary Pattern Histogram) Algorithm, histogram data is checked against an established dataset, and the device automatically labels attendance. An Excel sheet is developed, and it is updated every hour with the information from the respective class instructor.

Keywords: Face Detection, Face Recognition, HaarCascade classifier

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INTRODUCTION

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 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.

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.

Nowadays, face recognition system is prevalent due to its simplicity and awesome performance. For instance, airport protection systems and FBI use face recognition for criminal investigations by tracking suspects, missing children and drug activities. Apart from that, Facebook which is a popular social networking website implement face recognition to allow the users to tag their friends in the photo for entertainment purposes.

Furthermore, Intel Company allows the users to use face recognition to get access to their online account. Apple allows the users to unlock their mobile phone, iPhone X by using face

recognition.The work on face recognition began in 1960. Woody Bledsoe, Helen Chan Wolf and Charles Bisson had introduced a system which required the administrator to locate eyes, ears, nose and mouth from images. The distance and ratios between the located features and the common reference points are then calculated and compared. The studies are further enhanced by Goldstein, Harmon, and Lesk in 1970 by using other features such as hair colour and lip thickness to automate the recognition. In 1988, Kirby and Sirovich first suggested principle component analysis (PCA) to solve face recognition problem. Many studies on face recognition were then conducted continuously until today.

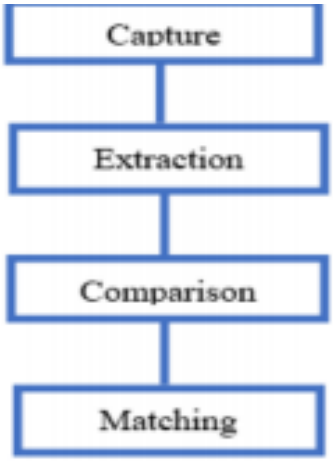

Fig 1. General face recognition process

PROJECT OBJECTIVE

Attendance is prime important for both the teacher and student of an educational organization. So it is very important to keep record of the attendance.The problem arises when we think about the traditional process of takingattendance in class room.

Calling name or roll number of the student for attendance is not only a problem of time consumption but also it needs energy. So an automatic attendance system can solve all above problems.

There are some automatic attendances making system which are currently used by much institution. One of such system is biometric technique and RFID system. Although it is automatic and a step ahead of traditional methodit fails to meet the time constraint. The student has to wait in queue for giving attendance, which is time taking.

This project introduces an involuntary attendance marking system, devoid of any kind of interference with the normal teaching procedure. The system can be also implemented during exam sessions or in other teaching activities where attendance is highly essential. This system eliminates classical student identification such as calling name of the student, or checking respective identification cards of the student, which can not only interfere with the ongoing teaching process, but also can be stressful for students during examination sessions. In addition, the students have to register in the database to be recognized. The enrolment can be done on the spot through the user- friendly interface.

The objective of this project is to develop face recognition attendance system.

TECHNOLOGIES / SOFTWARE REQUIREMENTS

- **Operating System :** Windows 7 and Above
- **IDE :** Visual Studio Code
- **Programming Language:** Python (3.8.5) 64-bit
- **Back-End:** MySQL Database (8.0.32)

HARDWARE REQUIREMENTS / HARDWARE USED

- **Processor:** Intel Core i3 (6^{th} Gen) i3-6006U Dual-core (2 Core) 2.0 GHz
- **RAM:** 4 GB (DDR3L-1600)
- **Hard Disk:** 500 GB HDD
- **Webcam**

MODULES DESCRIPTION

Admin Panel

- **Secure Login and Logout**
- **Dashboard**
    - Display the summary of lists.
- **Attendance List Management**
    - Add New Student
    - List All Students
    - View Student Details
    - Update Student Details
    - Delete Student Details
    - Import Student Data
    - List Student's Update History Details
    - Upload Student Attendance Details
    - Export Student Data
- **Manage User List (CRUD)**
- **Register**
- **Student**
- **Data Train**
- **Face Recognition**
- **Attendance**
- **Database Test**
- **Developer**
- **Help & Support**
- **Exit**

PROJECT OUTCOME

Face recognition systems are part of facial image processing applications and their significance as a research area are increasing recently. Implementations of system are crime prevention, video surveillance, person verification, and similar security activities. The face recognition system implementation can be part of Universities. Face Recognition Based Attendance System has been envisioned for the purpose of reducing the errors that occur in the traditional (manual) attendance taking system. The aim is to automate and make a system that is useful to the organization such as an institute. The efficient and accurate method of attendance in the office environment that can replace the old manual methods. This method is secure enough, reliable and available for use. Proposed algorithm is capable of detect multiple faces, and performance of system has acceptable results.

PROPOSED TIME DURATION

	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8	WEEK 9	WEEK 10	WEEK 11	WEEK 12
Requirement analysis and feasibility check												
Designing												
Coding												
Testing and maintenance												

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