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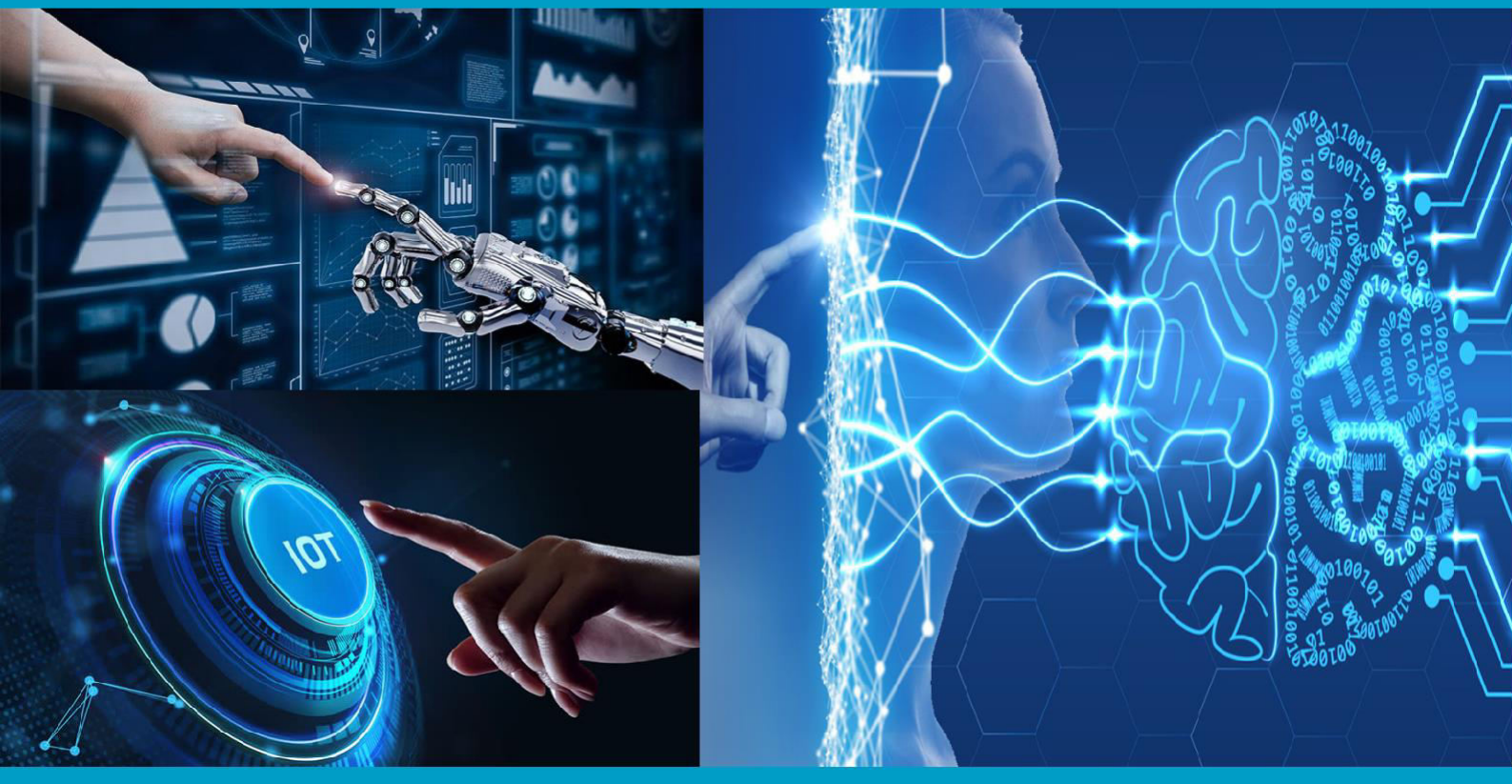

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Face Recognition System Using Open CV for Smart Attendance

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ABSTRACT: The main purpose of this project is to build a face recognition-based attendance monitoring system for institutions to enhance and upgrade the current attendance system in to more efficient and effective as compared to before. The existing system has a lot of ambiguity that causes and inefficient of attendance taking process. The problem arise when the authorities are unable to enforce the regulation that exist in the old system. Thus,by means of technology ,this project will resolve the flaws existed in the current system while bringing attend ance taking to a whole new level by automating most of the tasks.The technology working behind will be the face recognition system. The human face is one of the natural traits that can uniquely identifyan individual. Therefore, it is used to trace identity as the possibilities for a face to deviate orbeing duplicated is low. In this project, face databases will be created to pump data into therecognizer algorithm. Then, during the attendance taking session, faces will be comparedagainst the database to seek for identity. When an individual is identified, its attendance willbe taken down automatically saving necessary information into a database system. At the endof the day, the attendance information regarding an individual can be accessed from a webserver hosted by the raspberry pi. In short, this upgraded version of attendance monitoring system not only saved many resources, but also provide huge convenience to the authority as many processes are automated.

KEYWORDS*:* Face identification, GSM, LCD, Raspberrypi, Pi camera**.**

I. INTRODUCTION

In the 21st century, everything around us has become depends upon technology to make our life much easier.Daily tasks are continuously becoming computerized. Now adays more people prefer to do their work electronically.Many institutions are becoming more concerned with the constancy of attendance. In education institutes this is mostly important due to the fact that student's overall academic performance is impacted by their attendance at the institution. When it comes to documenting attendance, the two most frequent methods are calling out the roll call and having pupils sign a piece of paper. They were both more time-consuming and more difficult to complete. It is thus necessary to implement a computer-based attendance management system to assist organization in maintaining attendance records on a consistent basis. Over the last several years, video-based face recognition has received a great deal of attention, and it has emerged as one of the most important research questions in the area of image processing for people's identification.[1] N.Gupta,P.Sharma,V.DeepandV.Shukla, "AutomatedAttendanceSystemUsingOpenCV",2020 8th International Conference on Reliability, Infocom Technologies and Optimization(Trendsand Future Directions)(ICRITO),2020Despite the fact that there are many more accurate methods of identification than face recognition, it is making gradual but steady progress in biometrics owing to its noninvasive nature and the fact that it is the most used method of identifying individuals. When employed in the educational business, it may be used to regulate student attendance. [2]S. Kakarla, P. Gangula, M. Rahul, C. Singh and T. Sarma, "Smart Attendance ManagementSystem Based onFace Recognition UsingCNN", 2020 IEEE-HYDCON,2020.Various organizations, such as schools and businesses, require that students and employees report to work. There is an ancient technique of documenting attendance in a register that is both time-consuming and exhausting, as well as easily manipulated, destroyed, or lost. [3]E. Winarno, I. Husni Al Amin, H. Februariyanti, P. W. Adi, W. Hadikurniawatiand M. T. Anwar,Attendance System Based on Face Recognition System UsingCNN-

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PCA Method and Real-time Camera," 2019 International Seminar on Re-search of Information Technology and Intelligent Systems.[4]W. Zeng, Q. Meng and R. Li, Design of Intelligent Classroom AttendanceSystem Based on Face Recognition," 2019 IEEE.We are all acquainted with this system. [5] S. Bhattacharya, G. S. Nainala, P. Das and A. Routray, "Smart Attendance Monitoring System (SAMS): A Face Recognition Based Attendance System for Classroom Environmen," in 2018 IEEE 18th International Conference on Advanced Learning Technologies (ICALT), 2018Many biometric solutions, including as fingerprints, iris recognition, smart cards, and others, have been developed to address this problem, and are currently being used successfully in businesses of all sizes to prevent it from occurring.[6]F. P. Filippidou and G. A. Papakostas, "Single Sample Face Recognition Using Convolutional Neural Networks for Automated Attendance Systems," in 2020 Fourth International Conference On Intelligent Computing in Data Sciences (ICDS), 2020Due to the fact that it may be used for a range of applications like video surveillance, attendance monitoring in different firms, and other security objectives face recognition is the primary focus of researchers in this field.[7] A.Arjun Raj ,M.ShohebK. Arvind and K.Chethan, Face Recognition Based Smart Attendance System",2020 It shows how face recognition technology may be used in the field of many organizations to construct a reliable attendance system that automatically records an enrolled individual's presence inside a particular place without the need for human intervention.[8]S. Bhattacharya, G. Nainala, P. Das and A. Routray, "Smart Attendance Monitoring System(SAMS): A Face Recognition Based Attendance System for Classroom Environment", 2018 IEEE 18th International Conference on Advanced Learning Technologies(ICALT),2018.While the technique for using a face recognition system is divided into multiple steps, the most important of these are the face detection and recognition steps.[9] Elias, S.J.,Hatim, S.M.,Hassan, N.A.,Abd Latif, L.M.,Ahmad, R.B.,Darus, M.Y.,Shahuddin, A.Z.: Face recognition attendance system using local binary pattern (LBP). Bull.Electr.Eng. Inf. 8(1),239–245 (2019 In the automatic attendance system based on face recognition camera is installed at the entrance. This system uses camera to capture the images of the employee to do face detection and recognition. The captured image is compared one by one with the face database to search for the worker's face where attendance will be marked when a result is found in the face database. When the captured face matches with the images saved in the memory then LCD displays the number of the student and also GSM sends the messages to the authorized person.

II. EXISTING SYSTEM

Using a survey of the literature on video and image-based face recognition, we learn about the many face recognition algorithms available, and we also recognize that face recognition is generally a two-step process that involves both face detection and face recognition. It is impossible to over estimate the significance of detection in getting a high recognition rate for a given set of data. Face detection and identification algorithms have been developed in recent years by academics. .Additionally, there are many uncertainties towards the sources of this attendance records which in fact, most of the attendance records are not retrieved from the actual situation. The old method that uses paper sheets for taking attendance can no longer beused. To reduce the errors occurred in the previous system ID card reader system came intouse that uses ID card to take the attendance. But it has some disadvantages like forget or missing the ID card, materials like metal and liquid can impact signal and sometimes not as accurate or reliable as barcode scanners.

III. PROPOSED SYSTEM

In the automatic attendance system based on face recognition camera was installed at the entrance.This system uses a camera to capture the images of the employee to do face detection and recognition.The captured image is compared one by one with the face database to search for the worker's face where attendance will be marked when a result is found in the face database. The main advantage of this system is where attendance is marked on the server which is the highly secure where no one can mark the attendance of other. When the captured face matches with the images saved in the memory then LCD displays the number of the persons and also GSM sends themes sages to the authorized person. This helps to reduce the human errors and also overcome the problems faced by the student ID card reader attendance system. The proposed system is intended to reduce the shortcomings of the current manual system by automating the attendance of various organisations. A camera application that uses computer vision face detection algorithms and face extraction techniques to record pupil faces and store them in a file has evolved with the attendance system.Each pupil in the organization must register by providing the necessary information before their images are taken and added to the dataset. Faces will be recognised from live streaming during the event. The identified faces will be compared to the dataset's image data. If a match is made, the attendance of the relevant pupil will be recorded. A list of absentees will be mailed to the staff member in charge of the session at the conclusion of

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each session.The second module is a desktop programme that registers the students, performs facial recognition on the images (faces) in the file, and then saves the findings in a database for later analysis.

3.1 METHODOLOGY

A. Block Diagram

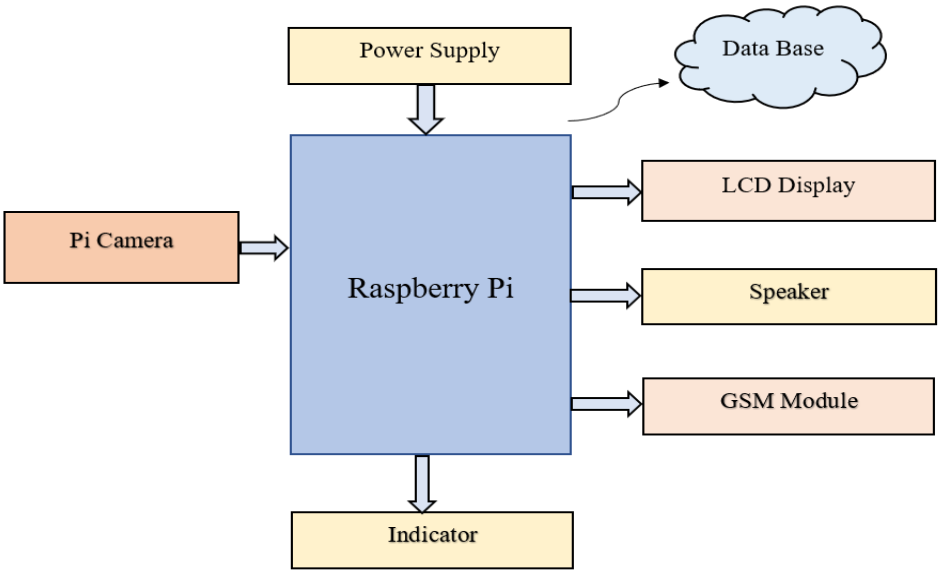
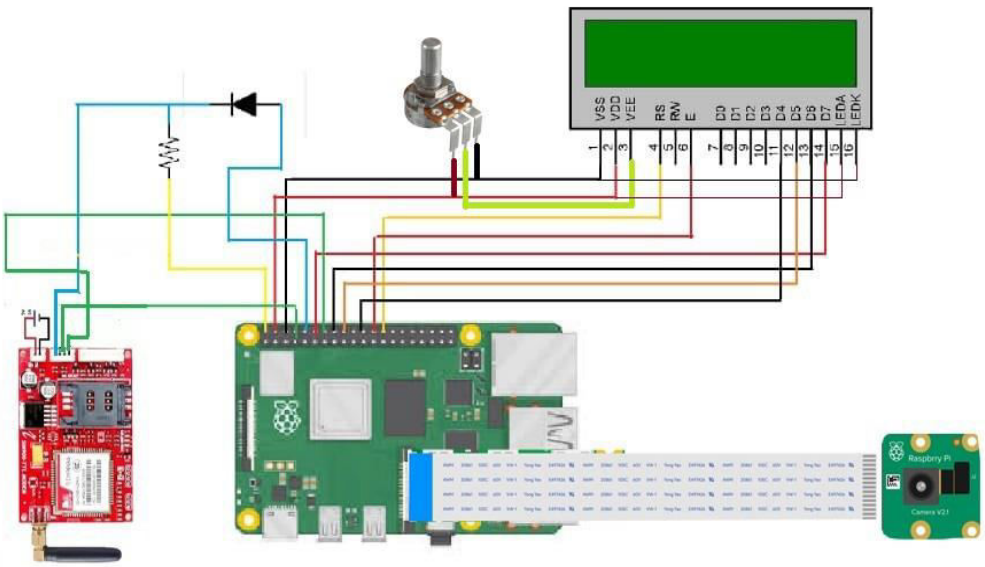


Fig1: BlockDiagram

3.2 SCHEMATIC DIAGRAM

The raspberry pi 3 consists of 40 GPIO pins. The GPIO7 , GPIO8 , GPIO25, GPIO24, GPIO23, GPIO18 are connected to the RS, E, D4, D5, D, D7, LED+, LED- pins of LCD display. Potentiometer output pin is connected to the VEE pin of LCD to increase the brightness of the LCD. Pi camera is inserted into the raspberry pi camera slot. GSM pins Rx, Tx, GND are connected to raspberry pi Tx, Rx, GND respectively.



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IV. HARDWARE COMPONENTS

4.1 RASPBERRYPI3:

Raspberry pi is a series of small single-board computers (SBC is a complete computer built on a single circuit board,with microprocessors,memory,input/output and other features required of a functional computer) developed by the Raspberry Pi foundation as shown in Figure3.1.All models feature a broad com system on chip (SoC) with an integrated ARM compatible CPU and on-chip graphics processing unit(GPU). It promotes Python programming languages.

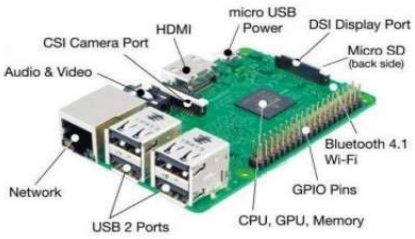

Fig2: RaspberryPi 3

4.2 LCD:

A liquid-crystal display (LCD) is a flat panel display, video display that uses the light modulating properties of liquid crystals. liquid-crystal display accepts two types of signals,such as data and control. These signals are recognized by the LCD module from status of the RS pin as shown in Figure3.2 .Now the data can be read from the LCD display, by pulling the R/W pin as high. LCD display reads data at the falling edge of the pulse and executes it,When the pin E is pulsed.

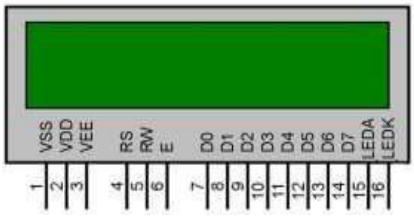

Fig 3:LCD

4.3 PiCAMERA:

The pi camera module is a portable light weight camera that supports raspberry pi.It communicates with pi using the MI PI camera serial inter face protocol.5MP Camera exclusively made for Raspberry Pi. It can take 1080p High-Definition Videos. Small in size and can be connected directly to the Raspberry Pi.1080p,780p and also still pictures.

Fig4: PiCamera

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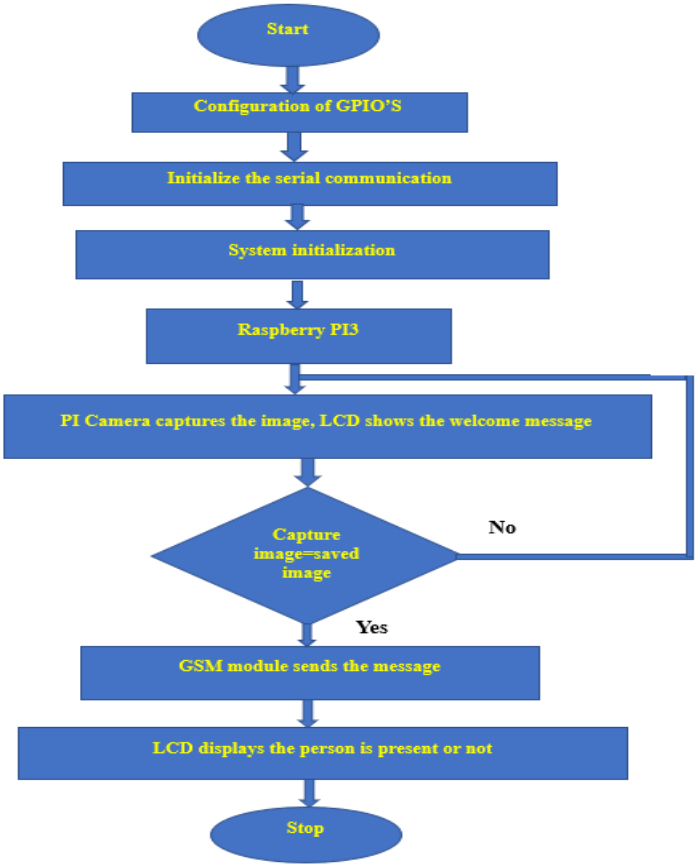
V. WORKING

The images of persons are taken and stored in the memory card. Camera which was installed at the entrance of the room will continuously captures the images of the persons and the captured image will be compared with the images stored in the memory card and LCDdisplays the person is present or not and sends the messages to the authorized person. The person data will be stored in the database.

VI. FLOWCHART



VII. RESULT

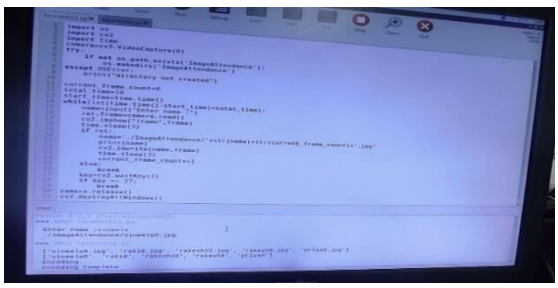


Fig5: Registration of the person

Fig6: Capturing the Person Face

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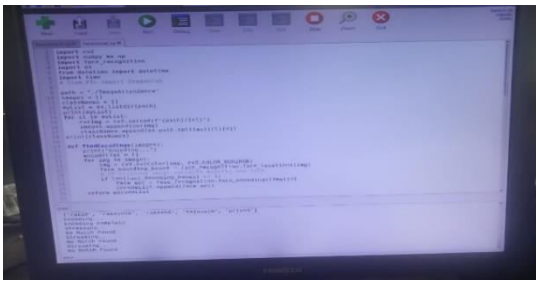

Fig7: Match Found for Registered person

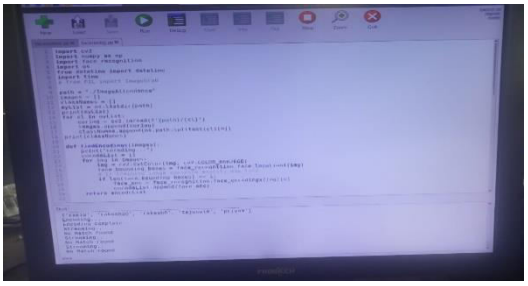

Fig8: Match Not Found

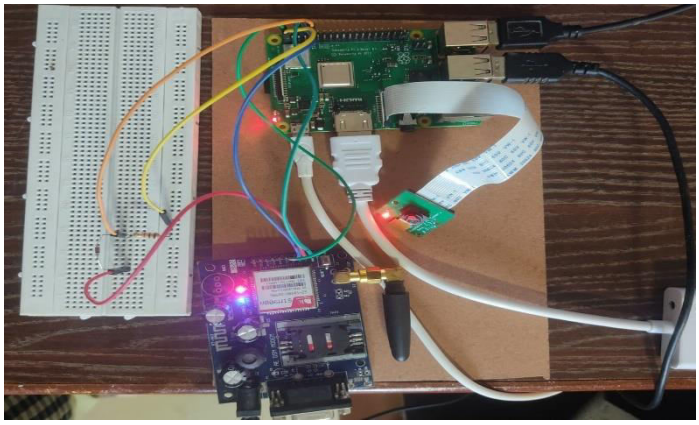

Fig9: proposed output

VIII. CONCLUSION

Finally, the project was concluded by proposing an idea of automatic attendance system based on face recognition. It captures the images of a person and saves the date and time of the person while capturing the image. It sends the messages to the authorized person and displays the person is present or absent in the LCD.

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