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Human Image Classification and Identification

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Abstract: ***Face Recognition is in recent times used as a chunk of various applications. It is used as a piece of the makes use of images processing applications. The Raspberry Pi 4 is embedded system. It is low cost, a single-board computer used to lessen the complexity of systems in actual time applications. This project is especially based on python. Raspberry pi carries Camera slot Interface (CSI) to interface the raspberry pi camera. Here, Images captured by using the Raspberry Pi camera module are improved so that it will identify the specific region of image. This is used in the real time application of 'Smart Attendance System'. We have proposed to implement a "Smart attendance system using Face Recognition". This system makes use of Face recognition package which saves a number of time than conventional method. This system requires Raspberry Pi 4, Open CV, Python etc. The system uses Face Recognition Package. This system compares the image of the test and the training image and decide who is present and absent. If student is absent a message will be sent to their parent's phone number. Student will be greeted with the voice when he/she come in front of camera by using text to speech mechanism. The system wishes "Happy Birthday" if student's birthday is there by checking the birth date and current date.***
Keywords: Open CV, Face Recognition, Raspberry Pi, Face recognition package.

I. INTRODUCTION

In schools and colleges, it is not easy to keep track of whether all students are arrived on time or not especially in a classroom of nearly 100 students. All this handwritten collected data of attendance is tough to analyze manually. As a way to this trouble people brought digital attendance system where each student's Id is scanned to mark the attendance. Further sensors have developed to scan the fingerprint of student. Each of those has its own pros and cons. Biometric system can motive threat of highly important biometric data together with fingerprints.

Hence Face Recognition is the satisfactory solution. This system will mark attendance automatically by spotting and recognizing the face of each student. There are so many steps in this process however face detection and face recognition are the important. First of all, we want database of every student's face in order to compare test image. The camera is used to capture the image of student which is further served as an input to the system. If the image is not matched with existing database, then system will say "Face Not Found". The database consists roll number, name, phone number, parent's phone number. We have decided to use Face Recognition Package and HOG.

II. LITERATURE SURVEY

The exploration has carried out by the following people and their published paper has motivated us for this project design. Both physiology and information proposition and the practical requirements of fast-real-time performance and accuracy motivate the computerized approach taken in this system. This technique treats the face recognition problem in place of requiring a improving of three-dimensional geometry, via means of taking the advantage of the reality that, faces which can be typically upright and consequently a brief set of two-dimensional distinctiveness can be identified. This technique is a two-dimensional recognition problem. This research suggest that the automated approach is pretty accurate, despite the fact that the rejection rate is drastically unknown' and therefore potentially suitable for the ones applications.

1) "Face Recognition Based Smart Attendance System"2020 International Conference on Intelligent Engineering and Management (ICIEM). This project proposed to implement a smart attendance system where camera capture pictures all students and it transformed into gray scale for recognition.

2) "IOT based Automated Attendance with Face Recognition System". International Journal of Innovative Technology 2019. In this paper they have proposed system that captures the picture of classroom and recognizes the faces by cropping images.

3) "Face detection and recognition using Raspberry Pi 2016 IEEE International WIE Conference on Electrical and Computer Engineering (WIECON-ECE)". This paper aims at taking face recognition to a level in which the system can replace the use of passwords and RF I-Cards for access to high security systems and buildings with the help of PCA face recognition techniques.

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4) Implementation of IOT based Attendance management system on Raspberry Pi. International conference on Intelligent Sustainable Systems 2019". By V. Ruhita, V.N. Raj, G. Geetha. In this paper they have presented Attendance monitoring system with 96% accuracy. This system uses haar classifier.

5) "Face recognition with liveness detection using eye and mouth movement (2016)". In this paper they have implemented system that first tests for liveness of the user, and then performs face recognition.

III. PROPOSED METHODOLOGY

Our proposed smart attendance system is a very simple and easy to understand. We need Raspberry Pi4. The Raspberry Pi 4 Model B is the latest version of the low-cost Raspberry Pi computer. The Pi isn't like your typical device; in its cheapest form it doesn't have a case, and is simply a credit-card sized electronic board -- of the type you might find inside a PC or laptop, but much smaller.USB webcam is a camera which connects to a computer, usually through plugging it in to a USB port on the machine. The video is fed to the computer where a software application lets you view the pictures and also transfer them to the Internet.

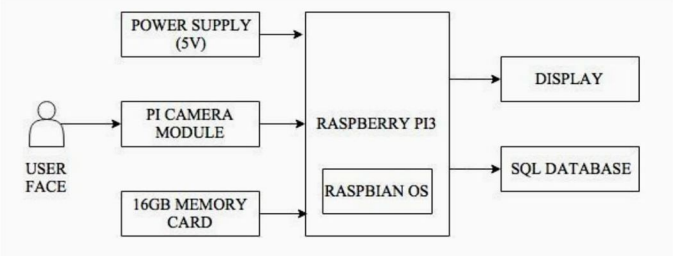
A. Software Requirements

1) Operating system: Raspberry Pi OS is a Debian-based operating system for Raspberry Pi. Since 2015, it has been formally provided by the Raspberry Pi Foundation .

2) Programming language: Python is an interpreted high-level general-purpose programming language.

3) Open CV, Face Recognition package, IDE, Input/Output

B. Hardware Components Required



IV. METHODOLGY

1) *Face Detection:* Face detection is a computer technology used in a many applications that identifies human faces in digital images.

2) *Face Recognition:* Face recognition is a method of identifying or verifying the identity of an individual using their face.

3) *Comparision:* It compares the test image with the images in database for identification.

4) *Face Recognition Package:* It is a package that's used to apprehend faces in a picture or folder complete of photographs. In this project we have used HOG (Histogram of Oriented Gradients) descriptor to carry out face recognition.

V. PROJECT SCOPE

Image classification applications are used in lots of regions like Attendance Monitoring system, Object identification in satellite image control systems, Traffic control systems, Brake light detection, Machine vision medical imaging.

A. Advatages And Disadvantages

1) *Advantages:* 1. Growing and trending technology 2. Vital roles in the safety of industry. 3. The main features of the image are separated, so that image recognition can be moderately implemented in diverse industries and fields.

2) *Disadvantages:* 1. Long installation and will need extra components when first starting (HDML cable, monitor, etc.)2. Might want to install programs to get simple actions going.3. Can be greater expensive.

VI. CONCLUSION

We propose to use Raspberry pi as price powerful however green answer for human image identification and classification. Accompanied by a numerous hardware and software program. We will be using Open CV and Face Recognition package.

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VII. FUTURE WORK

The future work is to improve the recognition rate of our system when the faces of the students are half covered or when they are partially visible.

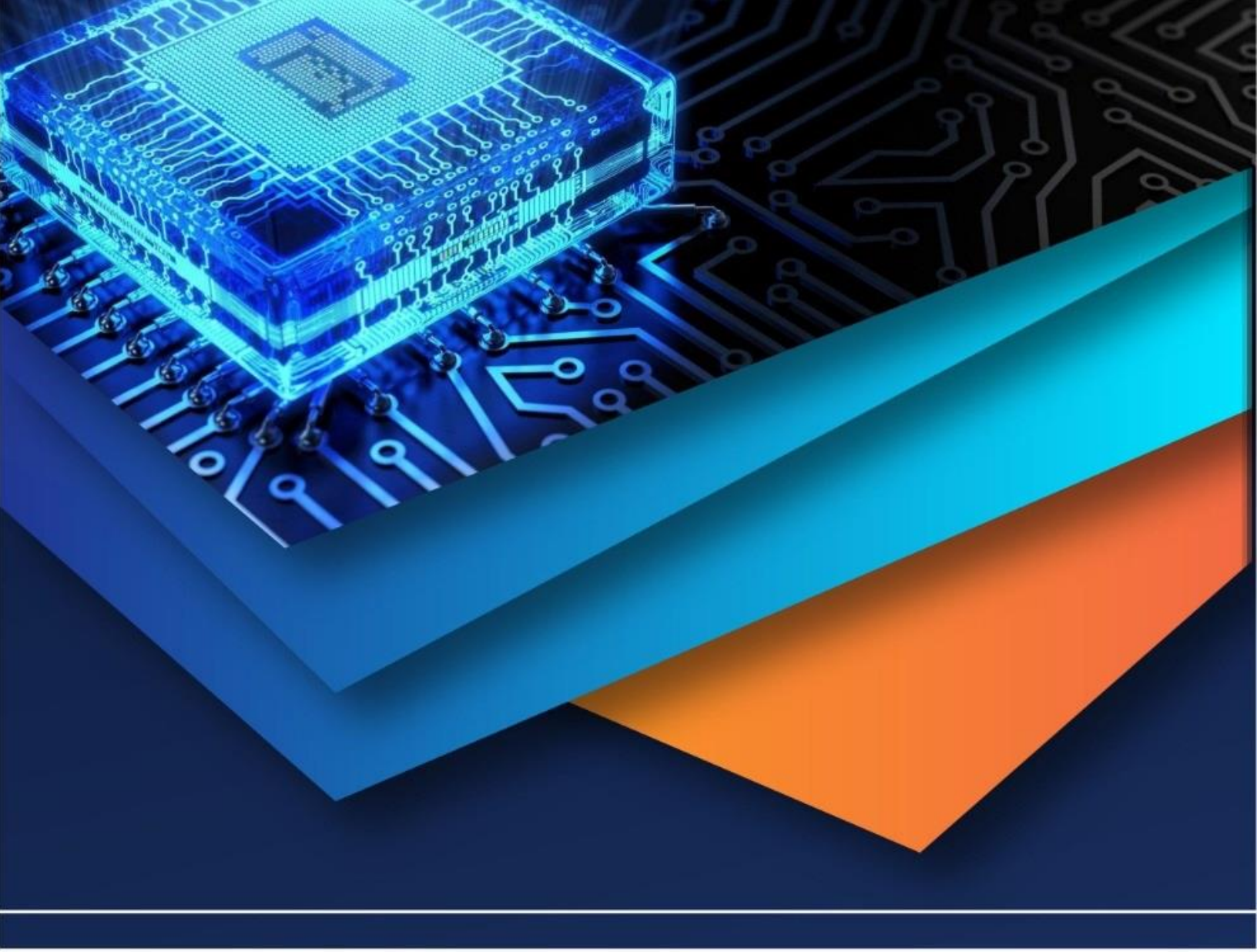
VIII. ACKNOWLEDGEMENT

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