

Drishti (An eye on Cap)

Khushboo Goswami¹, Shuchita Saxena², Mukul Chaudhary³, Rajat Agarwal³

¹Bachelor of Technology, Electronics and Communication Engineering Department, Moradabad Institute of Technology

²Assistant Professor, Electronics and Communication Engineering Department, Moradabad Institute of Technology

³Bachelor of Technology, Electronics and Communication Engineering Department, Moradabad Institute of Technology

Abstract -Our motive to provide this research paper is to build a system that will act as a powerful tool that can help the blind at various fields. It basically provides facial recognition and detection by pi camera. It includes a speech conversion for the person standing. In case of emergency an alert will be sent to the concerned guardian using GSM. This will also give the functionality to read book. This will be a real time monitoring system to assist the blind person. All this will be performed using Raspberry Pi B3+.

Key Words: facial recognition, face detection, GSM, Raspberry Pi B3+, pi camera., real time monitoring.

1. INTRODUCTION

On an average, in this world, around 36 million people have total vision loss. They cannot see shapes or single sources of light. Majority of them, blindness comes from reduce-able problems such as cataracts, they simply could not reach appropriate health care. Thus, by this a solution will be provided in the form of a wearable device. This will directly tell the person about the identity of the person standing in front of him. All work will be done with the camera and if the person belongs to the known member of his family or friend then the audio format will

be played tell him the person is known. If the user of system finds himself in any panic situation then an alert will also be sent to the family member telling that the user is in emergency.

2. LITERATURE SURVEY

2.1. Smart Facial Detection System

In this fast-paced world, we meet with a lot of people and all have a character to play in our life. Some are for a short span of time some are for a large. The System will work in such a way that if anything comes in the range between the 1 meter it will check for the presence of face,

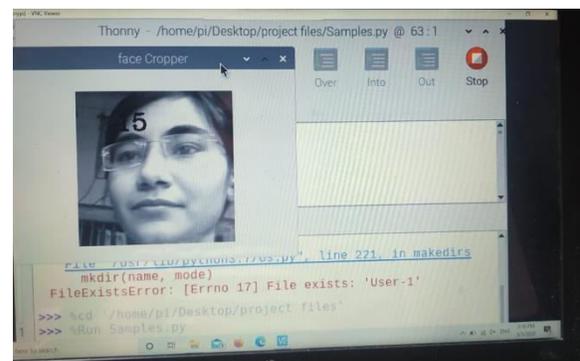


Fig -1: Smart Facial Detection System

If it is any person then it will tell the user that the face is present, there. The image given shows how the face will appear to camera in grayscale. This will further be transferred to recognition mechanism.

2.2. Smart Facial Recognition System

The camera acts as another eye that looks for us. Similarly, it will act as an eye to blind. The first step after detection of face will be recognizing its identity. This will be done by checking the records present in previous data present in data base. If the user is familiar with the identity of that face, it will generate the signal that face has been recognized.



Fig -2: Smart Facial Recognition System

2.3. Text to speech conversion

The objective of this project is to make an ease in the life of blind as they are unable to write or read by their own, this feature will enable them to read the text from the file. On an enlarged advantage one can read any book present in the records.

2.4. Emergency Alert System

This is basically designed to provide an ease for blind. Sense of security plays a vital role for everyone. There are some circumstances where the life is on stake. At this very moment everyone needs an assistant. This feature will enable the facility to give a message alert through a button. This complete procedure will be done by assigning some contacts numbers. Whenever the person feels that something is required, he will be capable to ask for help through this device.

3. BASIC BLOCK DIAGRAM

The basic block diagram of the system is shown in the figure below. The paper aims at designing an aid for the visually deprived people. It will be a compact system that can be used for helping them to identify the known people around them. This will also help then in rescuing by misleading someone. The whole system will work by guiding in voice which will only need internet connectivity.

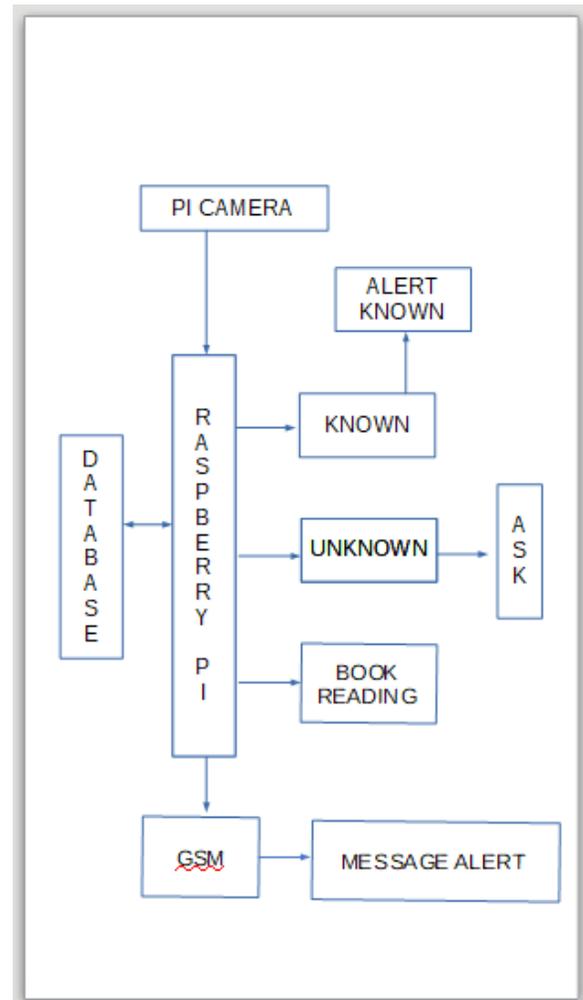


Fig -3:Block Diagram

4. HOW THIS DEVICE WORKS?

- The camera will be acting as the major tool to get all the data centered to

raspberry pi. Whenever the camera detects anything, first it will search for the presence of face. The face is detected by using some algorithms of open computer vision generally known as Open CV.

- Say if the user needs providing some known persons photographs, this will be done by another button, that on pressing it will start clicking pictures of the respective person.

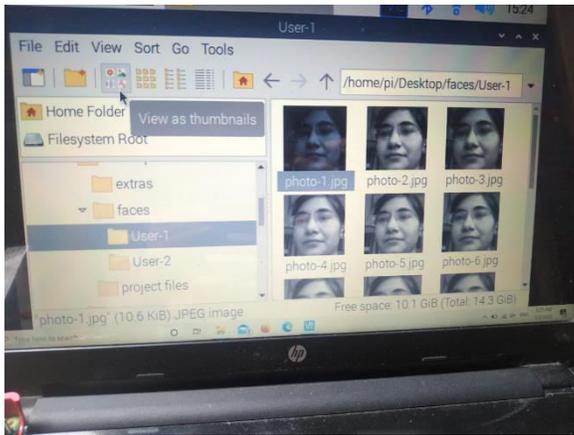


Fig -4:Dataset

- Now as the face is being detected by the camera, it will search for the presence of face in that, if the face is present then it will provide an alert by playing a sound that, “We know each other, please tell you name”.
- It will help in reading the book. Some books can be stored in data so that the user can read them. This will also be done by the text to speech functionality added in it. A button will be provided for this too.
- In case of emergency there will be a button for sending emergency alerts. For doing this we will be using a GSM service for sending alerts.

5. DEVELOPMENT OF SENSING DEVICE

The designing of the sensing device plays a major role to build a compact and sustainable product. it should be a Real Time Monitoring

System. For Usage, first concern is the compact size of the device, and secondly about how and where to install.

5.1. Size of the Device

To fix the size of the device, many formats has been defined. The size of monitoring system which is installed should be compact with respect of this we are developing this device which is portable and easy to carry anywhere to monitor the person as well as user interaction. For references, the device weight is approximately 100-150 gm, and its size is very small and compact.

5.2. How to use this Device?

To place on an appropriate position on the user, we should concern that it is place near the person’s approach. There are several designs of this Device such as cap, belts etc. Then the device should be positioned in the areas where all the faces can be detected.

6. COMPONENTS USED

The main components used in the project are as follows.

- Raspberry Pi
- Pi Camera
- Open CV
- GSM
- GPS
- Earphones (for audible output)
- push buttons

7. THINGS TO CONSIDER IN DRISHTI

It is helpful to understand what features are most vital and play important role in monitoring the faces encounters blind.

7.1. Ease of Use

It is important to make sure that the device is comfortable and easy for your use.

7.2. Battery Life

The best-case scenario is a monitoring device with few days' battery backup. The higher maintenance a unit is (requiring daily charging), the more likely you are to attach this device at any place, it is showing the best results.

7.3. Sensors

Camera will be acting as a major part for sensing the ongoing scenes. It will mainly search for the faces. Identifies that if these are known or unknown. Important features for a Wearable device are as follows:

7.4. Range

Whether you simply want to monitor the faces in your nearby surrounding or detect the person you need a sensor that will work for the detection of proper range which you require. Keep in mind this device is for the real time analysis and keep tracking the regular status of the approaching faces.

7.5. Alerts and Alarm

In this device we are using an audible output which works after the known face is reached. In the worst condition as person is in danger it will send the information for help to peers. Consider how often you want updates and how much flexibility you need for different circumstances.

7.6. Reset Button

If your device is not detecting all the gases or shows random data then press reset button to immediately let you keep the device in normal form.

7.7. Real-Time Analysis

When you need to know whether the quality of air in your surrounding is good or not then check it on this device. If monitoring your nearby area air in real time is healthy or not, make sure you put your device in an open area.

7.8. Book Reading

Whenever the person wants to read any book, there will be a functionality that can enable that person to read book and that will be an audible format.

8. CONCLUSION

In this paper we have reviewed the Drishti, a device that can be used by the blind which will help them to firstly recognize the faces and then to find out the known and unknown. Firstly, we have defined the various systems and devices available. Raspberry Pi or any other micro controller having camera compatible hardware could be used with it, reset button and the Sensors to keep the track. There are some important things to be considered like the limited range of device and sensor, Battery life and the most important is the size

9. FUTURE ASPECTS

The device can be updated with additional sensors that can sense data from the existence of other features like voice-based calling. These will provide the condition of the audible voice supported assistant and person can take into further decisions accordingly. The sensors that we have been worked with can also be reset according to most recent time update. In future time, our device can be kept testing for checking whether the sensors still run properly and give real time data.

10. REFERENCES

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