

Facial Recognition Smart Glasses For Visually Challenged Person

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Abstract— People who are visually impaired typically struggle to manage a variety of issues in their daily lives, including travel. Wooden Sticks are typically used to detect boundaries and impediments nearby. Because they are unable to accurately predict the difficulties they will encounter, visually impaired people are forced to rely only on lead sticks and training in order to navigate securely and correctly. This study focuses on the creation of a guiding system that makes use of wearing smart glasses and a sensor to continuously collect photos from the surroundings. The user would have a lot more thorough understanding of the procedure thanks to the smart glass's processor, which is equipped to process the photos that are collected and recognise objects to educate the user about the outcomes of the image.

Keyword—Raspberry pi 4, ultrasonic sensor, mini Camera, earphones, battery 5v,wires, glasses, USB cables.

I. INTRODUCTION

The human visual system is crucial for recognising information about the environment. Visual signals are more effective than auditory signals when information is seen by a human being because they include more data than auditory signals. However, the absence of visual information prevents blind persons from recognising information. A subject's ability to communicate is necessary for a blind person to recognise them. Additionally, as blind individuals primarily rely on their aural sense to recognise information, it might be challenging for the blind to recognise the subject even when they speak, such as in busy situations. As a result, blind people have

sensitive auditory senses and do not desire to experience listening disruption. We suggest a facial recognition system integrated with a smart cane for blind persons to address this issue and its limitations. This technology finds and recognises human faces, and after that, it gives blind people information about the person who is standing in front of them. Blind individuals can read personal information from a cane that produces vibration patterns in accordance with each educated individual. In our technologically advanced In this globe, there are millions of disabled persons who are constantly in need of assistance. Mobility independence lessens reliance on carers. Due to their physical limitations or inability to walk normally, disabled persons always find it difficult to go out on their own. People who are visually impaired confront numerous difficulties in their daily lives because many modern assistive gadgets fall short of consumer expectations in terms of cost and amount of aid. Here, we suggest a brand-new style of smart spectacles with assistance for people who are blind. The project of Blind aid aims to advance a broad issue in computer vision, such as the everyday practise of the blind in recognising people in their environment. A blind individual wears the camera on their glasses. To apply the necessary recognition, a collection of people drawn from commonplace scenarios is created. To find somebody, the camera is employed. The suggested approach for the blind strives to increase opportunities for those who have lost their eyesight to realise their full potential. Designing and implementing real-time object recognition utilising blind glass is the project's major goal.

II. METHODOLOGY

Nowadays, face detection systems are increasingly common since they can be far more secure than fingerprint and written passwords. You may be familiar with the face unlock feature on your smartphone, which is incredibly convenient. Face detection is also utilised for surveillance in various locations, including airports, train stations, and roadways. Due to the portability of the Raspberry Pi as a surveillance system, we will develop a face recognition system using the OpenCV library. I've tested this system, and it will undoubtedly function properly. It comes with two Python scripts, one of which is a training programme that will examine the collection of images of a specific person and produce a dataset from it, much like every other Face Recognition system. The second programme in this group is called Recognizer, and it looks for faces before using this h5 file to identify them and state their names. These programmes have been specially designed for Raspberry Pi (Linux).

What is OpenCV and How to Use it for Face Recognition?

OpenCV is a free and open-source library for image processing, computer vision, and machine learning. It now has a significant impact on real-time functioning, which is crucial for modern systems. Anyone may process photos and videos to recognise objects, faces, and even handwriting by utilising this package. When combined with other libraries, such as NumPy and Python, the OpenCV array structure can be processed for analysis. It recognises the properties of visual patterns that will be utilised to conduct mathematical operations in vector space. You can read this article to learn more about OpenCV. This will need to be done in order to install OpenCV and prepare it for face detection.

Working Process :

A webcam's video feed is nothing more than a continuous stream of updated images, each of which is just a collection of pixels with different values arranged in a certain position. Since we are using the OpenCV library, which is incredibly simple to use, face Recognition can be understood without going deeper into the concepts. There are numerous algorithms behind detecting a face from these pixels and further recognising the person in it, but trying to explain them is beyond the scope of this tutorial. The packages needed for facial detection must be installed.

Hardware Implementation :

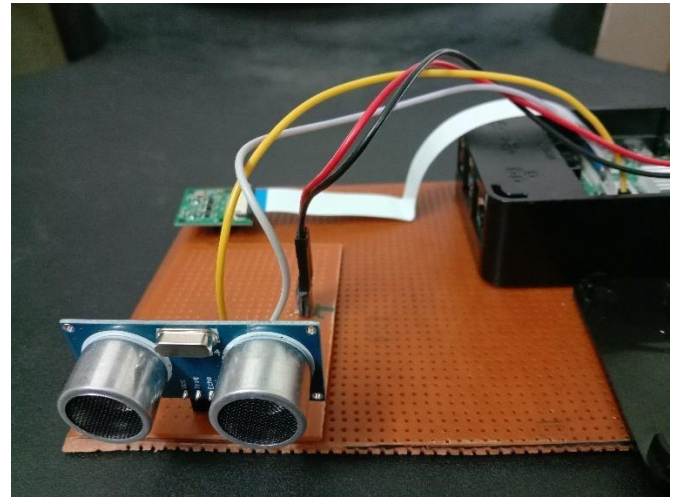


Fig 1. Sideview Of Hardware

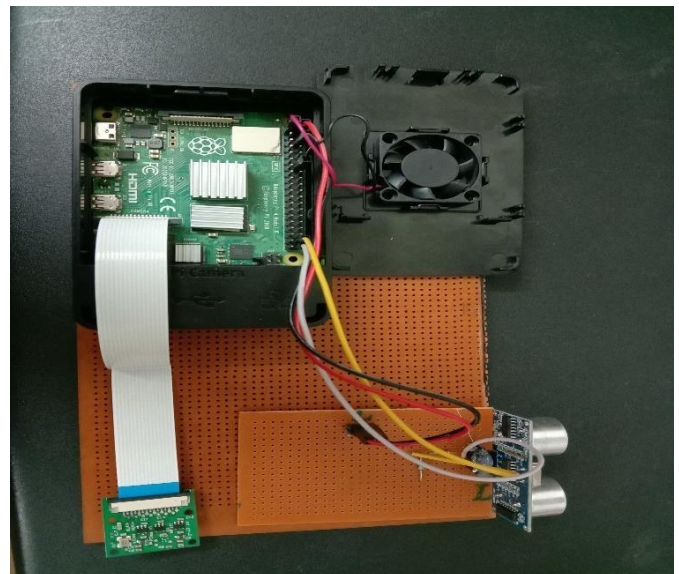


Fig 2. Connection of Hardware

Proposed Block Diagram:

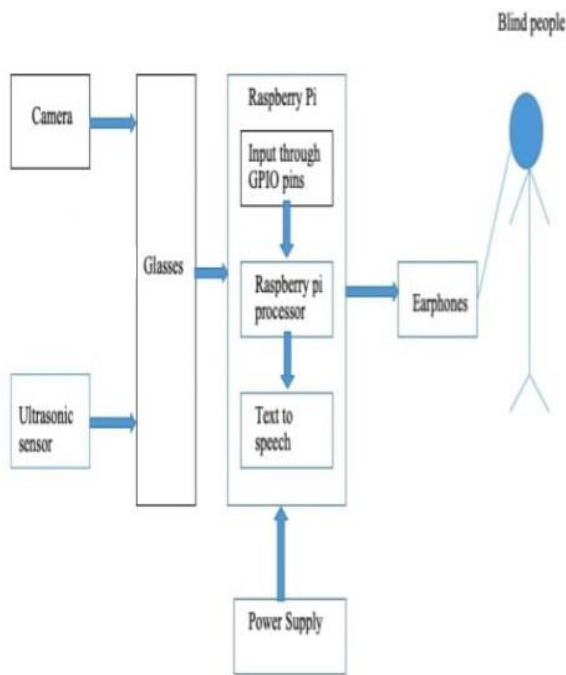


Fig 3. Block Diagram

Designs Steps:

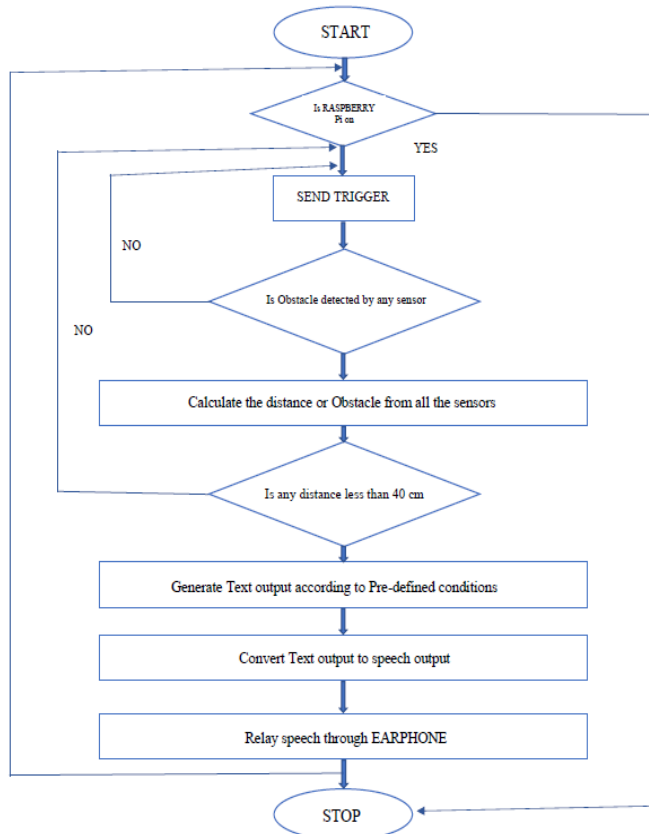


Fig 4. Flowchart

III. ADVANTAGE

A vision impaired individual can use this suggested technique to recognize the person in front of him and learn about potential difficulties. Face recognition and distance detection features will make this possible. The facial recognition technique in this system uses the Raspberry Pi and Pi camera. It assists the blind person. It gives voice-based messaging system alerts. It helps in employing an ultrasonic distance finder sensor to detect obstacle. It is an effective, affordable design. It has low power requirements.

IV. CONCLUSION

The internet of things, sometimes known as IoT, is a cutting edge concept that allows us to operate electronic devices over the Internet. This Internet of things (IoT) based technology is specifically made to help blind people by employing a unique Mini camera. The most recent technology accessible now is Raspberry Pi. The Raspberry Pi, however, is unique since it has its own operating system, which minimizes the impact on the human body. This technology is cost-effective, highly efficient, and environmentally friendly.

V. REFERENCES

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