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AI GUIDANCE FOR BLIND PEOPLE

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Abstract – Visually challenged people (VCP) struggle in their everyday life and have major difficulties in participating in cultural, tourist, family, and other types of outdoor activities especially those which are in unfamiliar surroundings. In modern days, synthetic intelligence is imparting a wide variety of answers for any hassle. This paper represents an guidance machine for blind . It is a wearable device which guides people efficiently and safely. This device is speedy and accurate for object detection by means of the digital camera and sensor for obstacle detection.An impaired person can wear this system and command this system for finding the things using voice command. This system recognizes these commands and gives a desirable output in voice. Also while travelling, it detects objects and obstacles and notifies about it to the user using voice output.

Key Words: *Obstacle detection, Text recognition, wearable device.*

1.INTRODUCTION

In the modern era of information and communication technology, the lifestyle and independent movement of blind and visually impaired people is among the most significant issues in society that need to be addressed. According to the World Health Organization, at least 2.2 billion people worldwide suffer from vision impairment or blindness .The focus of the project is to develop a device that guides the blind in an efficient and safe manner. This is a wearable device which is wore by the blind people .This system can help to detect staircases, text from anywhere, person, digs, vehicles, doors, obstacles, and currency which will help blind people to be independent. This is a wearable device which is wore by the blind people.

2. Literature Survey

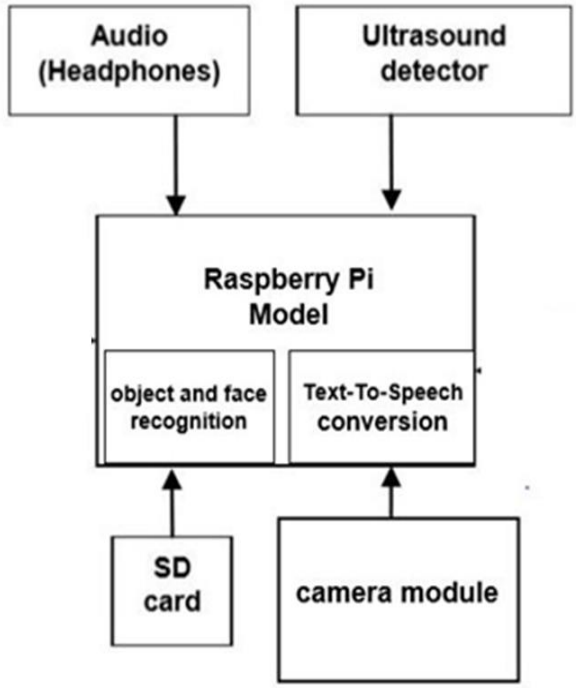
[1]: IoT based Intelligent and Multi-functional Shoe for the Visually Impaired.
This research paper proposes the design and development of an intelligent and multi-functional device for the visually impaired peoples.

[2]: Smart Cane: A low fee assistive tool for the visually impaired.
This paper is to introduce an lower priced clever cane for every visually impaired character.
[3]: IOT-Based Third Eye Glove for Smart Monitoring.
The third eye glove will assist the blind individual in achieving their goal.
[4]: Design and implementation of guidance machine for visually impaired human beings.
The proposed system, a wearable vest is used to help blind people avoid obstacles or any risk walking.
[5]: Smart Glasses for Visually Disabled Person.
Developing a smart eyewear that the blind person can use to assist him with his everyday activities.
[6]: Blind People Guidance System using Stereo Camera.
A stereo camera based assistive-system which can detect objects and or obstacles around the blind people.
[7]: BlindShoe.
An electronic guidance system to aid the visually impaired people in navigation by detecting obstacles in the front and the backside of the individuals. An digital guidance gadget for the visually impaired humans. An electronic machine to resource the visually impaired human beings in navigation by way of detecting limitations within the the front and the back of the individuals.
[8]: Object Detection System using Arduino and Android Application for Visually Impaired People.
A proposed system which is android based and it detects the object in front of the blind person.

3. Proposed System

Gas level detection and automatic booking are designed with various features that are implemented using Arduino and this device will be a single system with multiple applications for LPG consumers. The device monitors the load if the gas level and displays it within the alphanumeric display incessantly. It also detects the gas leakage by gas senor. Then it sends an alert to the registered mobile number by an SMS with the help of the GSM module.

4. System Architecture



5. DESCRPTION OF COMPONENTS

- **RaspberryPi**

The RaspberryPi is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 may be used as pwm outputs), 6 analog inputs, a 16 mhz ceramic resonator, a usb connection, a power jack, an icsp header, and a reset button. It contains everything had to support the microcontroller; absolutely join it to a laptop with a usb cable or electricity it with a ac-to-dc adapter or battery to get commenced.

- **ULTRASONIC SENSOR:**

An ultrasonic sensor utilizes sound waves to detect objects by emitting ultrasonic pulses and measuring the time it takes for the echoes to return, providing distance information for object detection. It is commonly employed in applications like proximity sensing, obstacle avoidance, and robotics.

- **BUZZER**

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric are common applications for beepers and buzzers.

- **Camera module:**

The camera module used in the system for blind individuals with Raspberry Pi is a compact imaging device designed to capture images for obstacle

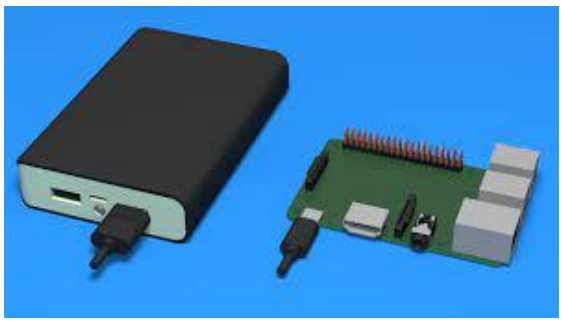
detection, object recognition, and text-to-speech functionalities. Integrated with the Raspberry Pi board, it employs image processing algorithms to analyze captured scenes, enabling the system to identify obstacles, recognize objects, and extract text.

- **Headphones:**

  Headphones are audio devices worn over or in the ears, typically consisting of two speakers (earcups) connected by a band that rests over the head. They come in various types, including over-ear, and wired .

- **Portable power bank:**

  A portable power bank for Raspberry Pi is a compact and rechargeable external battery designed to provide a mobile power source for Raspberry Pi single-board computers. Equipped with USB ports or other compatible connectors, these power banks allow users to power their Raspberry Pi devices in situations where a traditional power source may be unavailable or impractical.



6. Working

Functionality 1: Obstacle Detection

1. Initialization:See electricity at the system is on.
2. Capture Front Image:The camera module captures an image of the front.
3. Obstacle Detection:Process the captured image using image processing algorithms to detect obstacles.
4. Buzzer Alert:If an obstacle is detected, trigger a buzzer sound as an alert.
5. User Response:The blind person clicks the button once to confirm the detection and provide feedback.
6. Direction Adjustment:After we will click the button, the system activates and adjusts the camera module's direction towards the detected obstacle.
7. Object Recognition:Capture a new image and process it to identify the object.
8. Audio Output:Provide audio output through a Bluetooth-connected device, announcing the name of the detected object.

Functionality 2: Text Recognition

1. Initialization:Ensure the system is powered on.
2. Capture Front Image:The camera module captures an image of the front.
3. User Request for Text:The blind person clicks the button twice to indicate a request for text recognition.

4. Text Capture:Activate the camera module and adjust its direction based on the user's guidance.
5. Text Recognition:Process the captured image to recognize and extract any text present.
6. Audio Output:Provide audio output through a Bluetooth-connected device, reading aloud the text that was recognized.

7. Conclusion

In conclusion, the proposed eyering system for blind individuals, featuring a Raspberry Pi, camera module, push button switch, Bluetooth, and a power bank, stands as a cost-effective and innovative solution. By integrating obstacle detection, object recognition, and text-to-speech capabilities, the system addresses crucial challenges in navigation and information access for the visually impaired. Its affordability is attributed to the use of widely available and reasonably priced components, making it accessible to a broader user base. The device's intuitive button-based interaction adds to its simplicity, ensuring a user-friendly experience. This cost-effective yet comprehensive eyering not only empowers blind individuals in their daily lives but also underscores the significance of affordability and accessibility in assistive technology solutions.

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