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Smart Blind Stick For Blind Person With SOS Providing System

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1. ABSTRACT

The stick's transmitter and receiver now have an ultrasonic sensor. The blind person will be informed via a buzzer or speech module if there is an obstruction in their way. The blind person's pulse rate and oxygen level are monitored by the pulse and spo2 sensor. The Global location System (GPS) is a radio navigation system that continuously provides civilian users with accurate location, navigation, and timing services around the globe. The system will deliver location and time information for an infinite number of people in all weather conditions, day or night, and anywhere in the world, to anyone having a GPS receiver. GPS-powered blind man apparatus It uses user input interface (remote controlled based) to intelligently determine its current location and, if it is the blind man's destination, to inform him. The device's core is the Node MCU. It maintains the current location data it receives from the GPS system so it can compare it with the user's target location. This allows it to calculate the distance to the destination and generate an alarm to notify the user ahead of time. The blind man can now directly instead of hearing an alert sound

2. INTRODUCTION

The electromagnetic radiation from natural energy sources that is reflected, emitted, or transmitted can be detected by it. When an active sensor is used, it sends out a signal and gets back a distorted version of the signal that was reflected. It recognizes Reflected responses from artificially Manufactured energy source-irradiated objects. Active sensors of this type are able to sense and identify both near and far obstacles. Furthermore, it can accurately calculate the distance between the obstruction and the blind. In the field of obstacle detection, there are four types of active sensors that can be utilized: radar, ultrasonic, laser, and infrared sensors. By sending out waves and receiving reflected waves, Bat K Sonar, Smart Cane, Smart Vision, and Guide Cane employ laser or ultrasonic sensors to detect obstacles in front of the blind. When an obstacle is recognized, it alerts the user by vibrating or producing an audio to warn of impending obstacles. Single or stereo video cameras installed on a wearable device are used to capture images by systems such as VOICE, Sound View, SVETA, and CASBLIP. These taken pictures are resized, given further processing, and then transformed into audio, voice, vibrations, or sounds. In these systems, there exists a correlation between the orientation of pixels and the warning sound signal frequency. A few sophisticated systems integrate the Global Positioning System (GPS) into the primary system. That's Notably, a GPS receiver can be used to determine a subject's current location as well as the proximity of adjacent landmarks. Certain systems, including

UltraCanne, Isonic, Telecat, etc., are already on the market. Feedback information typically manifests as sound or vibration cues. As a result, these Systems use vibrations or sound to convey their recommendations to the user. To enable the user to comprehend the signals and respond to them in real time, training is therefore required. Nevertheless, in certain cases, the cost of this training exceeds that of the actual product. Users can't afford it most of the time as a result. In the event that not, the data is sent as a blind individual would find it embarrassing to make such a sound in public. In our study, we attempted to address a few drawbacks: We created a stick that can identify barriers and emit a loud buzzing sound based on whether it's a fire, puddle, stair, or other type of obstacle. Our project's training won't cost as much as bringing in more goods. The blind receive instruction via an ultrasonic sensor. To make the Stick more user-friendly, a buzzer that serves as a warning tone is linked to it. With a computed time of 40 ms and an average distance of 20 cm before contacting the barriers, an extremely quick response is attained.

2.1 LITERATURE SURVEY

Examining previous studies, publications, and initiatives about emergency alarm systems and assistive technology for the blind would be part of a literature review for a "Smart Blind Stick" with an SOS (Save Our Souls) system. This is an organized method for carrying out this kind of literature evaluation. Look for studies, articles, and patents that address smart gadgets for the blind or visually handicapped, especially those that combine sensor and IOT (Internet of Things) technologies. Find studies that concentrate on the integration of SOS features into assistive equipment or wearable technology. Take note of the approaches, tools, and conclusions presented in these investigations. Examine articles that cover the development and application of smart blind sticks equipped with SOS features. Analyse the software and hardware designs that these research have suggested. Evaluate the From the viewpoint of visually challenged users, the developed systems' usability and accessibility are examined. Examine studies that look into the needs and requirements of people with visual impairments for emergency assistance and mobility aids. Recognize the difficulties blind people encounter in emergency situations and how technology might help them..An ultrasonic sensor is a device that uses ultrasonic sound waves to calculate an object's distance from it. An ultrasonic sensor relays information about an object's vicinity by sending and receiving ultrasonic pulses through a transducer.

3. METHODOLOGY

1. *Block Diagram*
2. *Flowchart*

1. Block Diagram :

1. Ultrasonic Sensor:
An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic Sound waves. An ultrasonic sensor uses a transducer to send and receive ultrasonic pulses that Relay back information about an object's proximity.

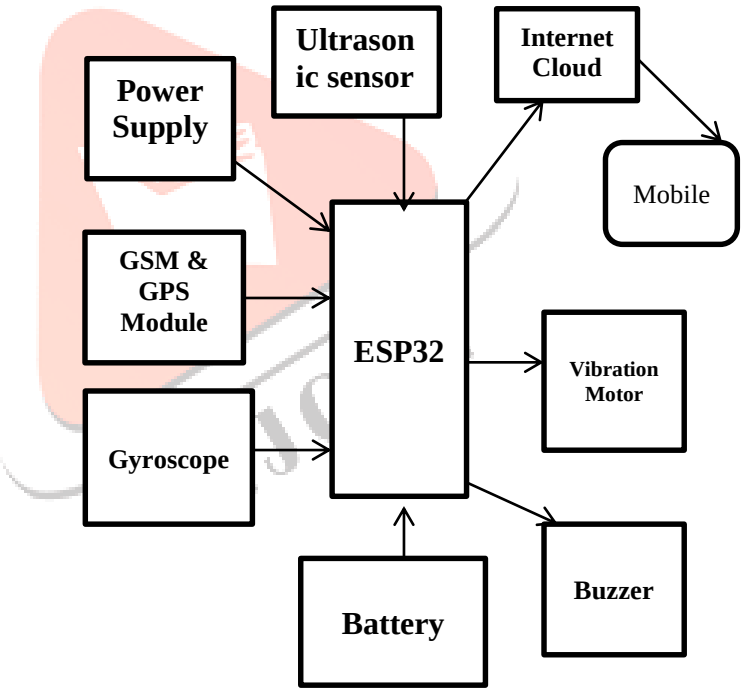


Fig.1 Block Diagram of Smart Blind Stick

2. ESP32:
The primary application processor's communication stack overhead can be decreased with ESP32. Through its SPI/SDIO or I2C/UART interfaces, the ESP32 may communicate with other systems to offer Bluetooth and Wi-Fi capabilities.

3.GPS Module:
Location: figuring out where something is. Moving from one place to another is known as navigation. Monitoring observing the movement

of an object or someone. Making maps of the world is called mapping.

4. GSM Module:

In order for devices and the GSM Network to communicate with one another, the GSM module is essential. It is in charge of creating and preserving the connection for communication between the device and the network. Additionally, the module manages data encryption and decryption, guaranteeing the communication's security.

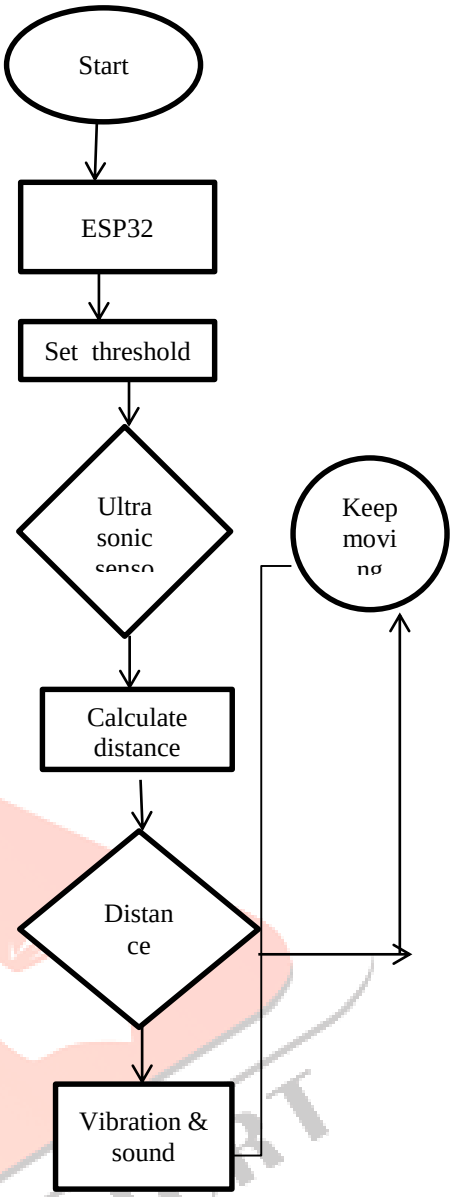
5. Gyroscope:

Gyroscopes are motion detectors that gauge an object's angular motion. They gauge how quickly an object rotates around one of the three available axes: the 1-, 2-, and 3-axis.An instrument used to measure and maintain an object's orientation and angular velocity is called a gyroscope sensor.

6. Vibration Motor:

Vibration motors are technological instruments that use energy to produce and transfer mechanical vibrations. A vibration motor is a small, silent, coreless DC motor that vibrates to alert users to the presence of a signal.

1. Flowchart



4. CONCLUSION

The danger of accidents and injuries for visually impaired people walking in public can be decreased with the use of a modern blind stick. The technology of the smart blind stick, which is equipped with sensors and is controlled by sophisticated algorithms to reduce the amount of human interaction, will advance and provide the groundwork for the next generation of assistive devices that will allow the blind to safely navigate. Other aspects of this system could be enhanced by extending the ultrasonic sensor's range and implementing a method for estimating the speed of approaching obstacles.

At this point, it should be mentioned that a great deal of work has gone into designing and implementing an articulate walking bolt for the blind. In the upcoming phase of more helpful apps, the Smart Stick serves as a dynamic interface for visually impaired persons to easily

and comfortably move both inside and outside of their environment. It's inexpensive and safe. As a result, obstacles are effectively detected up to three meters in the user's direction.

It provides economical, dependable, light-weight, low-power, and effective navigation with lightning-fast reaction times. The computer is lightweight, hardwired, and equipped with sensors and other features. The inclusion of wireless connectivity between the device's components will improve its extra functions, extend the reach of its ultrasonic sensors, and add technologies to gauge the proximity and strength of impending impediments. Using this strategy, we specifically targeted blind and visually challenged individuals in all developing nations. According to this investigation, the machine is limited to sensing humidity and obstructions.

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