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Smart Voice Alert System for Deaf and Blind Passengers

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Abstract— The deaf and blind people are commonly facing many inconveniences while traveling by public transportation. This project facilitates the main problem faced by the deaf and blind passengers who use the public without much difficulty. The main objective of the project is to provide the transport schedules alert and to guide the deaf and blind people to know the proper and full details of the public transport schedule. To intimate the vehicle arrived at the bus stop through the alert notification for the deaf and blind people. Here is the input which transfers from the notice device. Receiver systems will be kept with deaf and blind passengers. This system also includes a seismic wave generator. After the passenger reached the destination, the notice system transfers the alert data to the passenger.

Keywords: Seismic waves, Seismic wave generator, alert notification system.

I. INTRODUCTION

Public transportation plays an important role in productivity, people participation, and freedom for people who are visually impaired or blind since their visual deficiency does not allow them the comfort of making. The people who are blind and visually impaired use automobiles, trains, taxis, and services to travel freely to work, school, health care facilities, shopping, and many other places in their society. It can be difficult for a blind or visually impaired individual to use the public transport system. Zones are taken into consideration which includes preparing a route, locating the correct bus, locating the proper bus stop, and getting off the bus at the proper place. And this proposed project helps deaf and blind people to know the proper details of public vehicle schedules. This system is a real-time alarm in the form of seismic waves by regularly alerts deaf and blind passengers.

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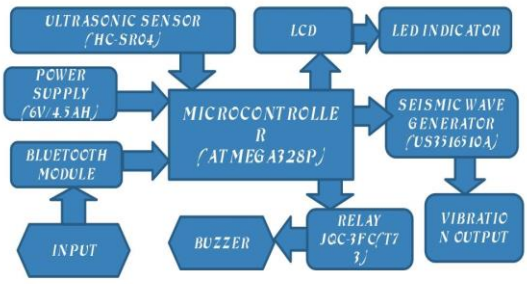
II. EXISTING WORK:

The main reason for the discomfort of blind and deaf passengers is unpredictable bus schedules have made it virtually impossible to estimate the time of arrival at the required destination and also they are unable to know the transportation schedules alert. The existing system is an alarm in a passenger mobile. When that particular passenger destination is been reached with help of an android facilitated with GSM and GPS for location identification.

III. PROPOSED SYSTEM:

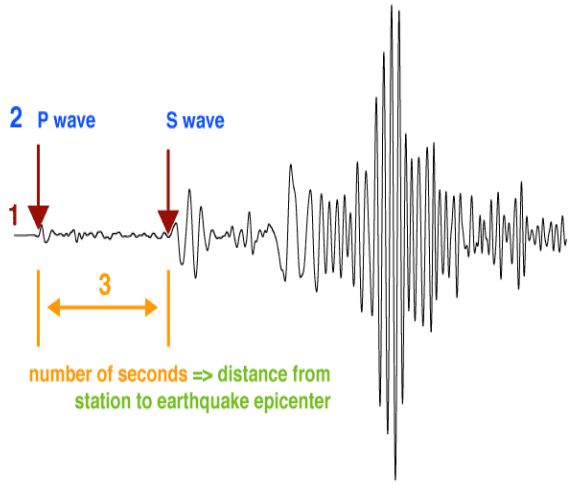
In the proposed system it consists of the transceiver. The transportation schedules are transmitted from the transportation office via a mobile app which is received by the receiver. The receiver circuit will be available with the deaf and blind passengers the received data is converted into voice through the speech synthesis method and later it is generated into seismic waves. Along with that, there will be an ultrasonic sensor for object detection and fall detection. There will be a voice alert part for the blind person which will send the voice alert. The buzzer sensor also makes the blind person identify the obstacles. There will be a vibration part for the deaf people in which the motor vibrated when approached by obstacles.



IV. BLOCK DIAGRAM:

A. SEISMIC WAVES:

Seismic waves are waves of energy that travel through the earth's layers and are a result of earthquakes, volcanic eruptions, magma movement, large landslides, and huge man-made blasts that give out low-frequency acoustic energy.



Seismic waves

B. ATMEGA328P:

ATMEGA328P is 8 bit, 32KB flash, microcontroller part of the mega AVR MCUs series, developed by Atmel. First, we need to install the Arduino boot loader into the chip. This IC with boot loader can be placed on an Arduino board and burn the program into it. Once the Arduino program is burnt into the IC, it can be removed and used in place of the Arduino board which is required for the project.

C. RELAY:

It acts as a switch and is used to isolate low voltage circuits from high voltage circuits. It is also used as an automatic change over. This project requires JQC-3FC (T73) which helps us to control the multiple circuits.

D. ULTRASONIC SENSOR:

The ultrasonic sensor is used for detecting the object and also measures the distance to a wide range of objects regardless of shapes, colors, or surface textures. In our project ultrasonic sensor (HC-SR04) send out sound waves through a high voltage electrical pulse and receive back an echo.

E. BLUETOOTH / Wi-Fi MODULE:

Here it is used for sending the text data through the MIT app (free cloud-based service) wirelessly. The received word is converted to a voice signal by text to speech module. Bluetooth function is used for short-range 2.4GHZ band wireless communication module.

F. VIBRATION OUTPUT:

The main purpose of this motor is to alert the user from receiving the call without sound/vibrating.

Frequency: f vibration = (motor RPM)/60

Force: F vibration = m*r* ω2

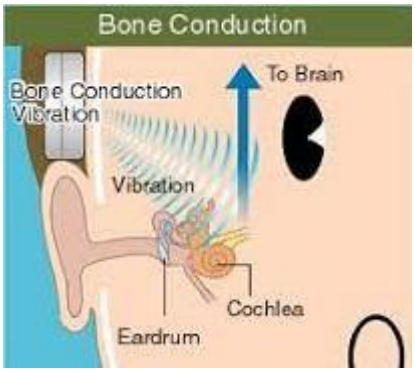
M = electric weight mass

R = offset distance of mass

ω2= 2 π f

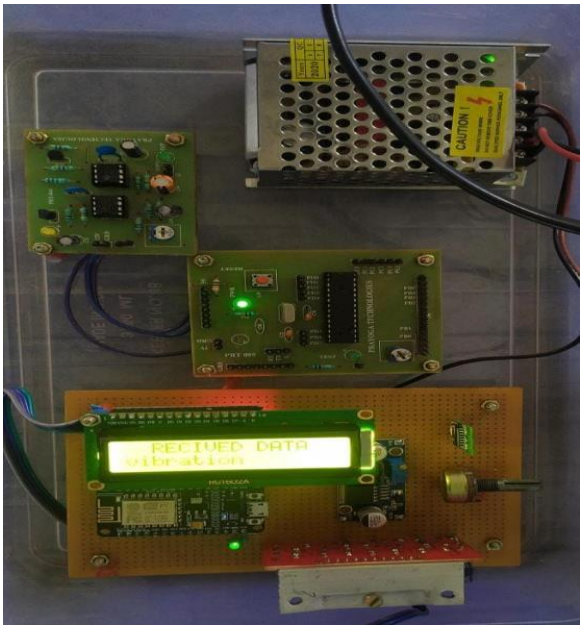
V.METHODOLOGY:

Sound waves travel through several structures in the ear, before being translated and transmitted through nervous systems to our brain. First, the waves enter the outer ear, which is the big floppy piece of cartilage that helps to focus the sound. From there, the sound waves go into the air-filled middle ear, which includes the auditory canal and the eardrum, a flap of skin that vibrates when exposed to the energy from sound waves. On the other side of the eardrum, there are three small bones, the ossicles, which are attached to it. They communicate the vibration to the cochlea, a liquid-filled structure that takes those vibrations and converts them to electrical driving forces that are sent along the hear-able nerve to the mind. Yet, that is by all accounts not the only way our body can handle sound. Sound waves can likewise be communicated through the bones in your mind. Whenever the bones vibrate, the sound arrives at the cochlea, similarly as it would be going through the center ear and eardrum, and results in similar kinds of nerve motivations being communicated to your mind. This strategy for sound transmission is known as the seismic bone conduction technique.



VI. WORKING AND RESULTS:

230v power supply will be converted into 5v. Input word text is given in the mobile app through MIT (free cloud-based services). The given input will be synthesized using the speech synthesis method. The input will be given in the mobile app. MIT app data is transmitted to the control kit via Bluetooth module. The received word is converted to a voice signal by text to speech module. When the input is given in the mobile app the receiver circuit will be ready to receive the data from the transmitter. This TTS technology reads aloud digital text – the words on computers, smartphones, and tablets. The input will be displayed in the LCD module. The boost converter helps to dump the frequency and the frequency has been controlled by a knob. The knob helps to increase or decreases the frequency level. And the given input voice is converted to a vibration signal by a seismic generator module.



Finally, this vibration signal is applied to the vibration motor, and the communication is done by the bone conduction method.

VII. CONCLUSION:

For many years, the seismic refraction method has been used in a variety of applications, such as geotechnical, environmental, groundwater, and archeological studies, as well as for the computation of static corrections in the reflection data processing. Now seismic waves can be used as a communication medium for deaf and blind people and developed a smart deaf and blind passenger voice alert system using seismic waves. With this system, deaf and blind people can easily transport themselves. They can understand the public transport schedules as normal passengers. It is an intelligent real-time alarm using seismic wave vibration.

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