

SMART SHOE FOR BLIND

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Abstract:

Eyes play important role in our day to day lives and are perhaps the most valuable gift we have. This world is visible to us because we are blessed with eyesight. However there are some individuals that lag this ability of visualizing these things. The increasing number of visually impaired people requires the development of assistive devices around the world. The problem can be solved by using a device that would serve as a smart guide to them. This device for visually impaired people would help them to travel and be self-dependent. This is to ensure that impaired humans with disabilities have the tools necessary to fully access and participate in the curriculum, with the greatest possible level of independence. Smart shoes is wearable system design to give directional info to visually impaired folks. To supply good and smart navigation steering to visually impaired folks, The device contains ultrasonic sensors at the front and at the sole of the shoe that will detect obstacles and elevations/sink in the ground respectively. The piezo-electric battery charging system will make sure that the device is constantly charged when the subject is on the move as well as used for providing power to various components. A GSM and GPS module will also be installed for easy tracking.

Keywords— Arduino Uno, Ultrasonic sensor, GPS,GSMmodule.

I. INTRODUCTION

There are about 40 million people in our country Blind people including 1.6 million children. Blind People need to rely on others for many aspects of their lives life. The main problem is when they walk down the street.

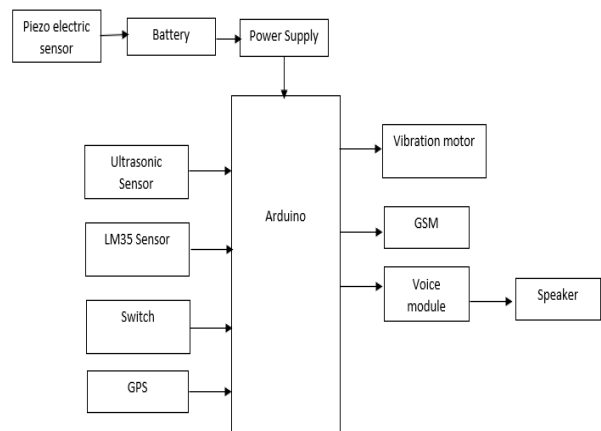
With In their hands they can't see all the obstacles Get in the way of them. So we will be designing a shoes which can help blind people to easily move in the surrounding. Shoes are the basic common thing which the man uses and to provide wearable technology inbuilt with it makes it easier to track their tasks.

The developed shoe will detect the objects or obstacles up to certain distance and send an alert message to the receiver in audio or vibrator form.

This helps the blind people to identify the object present on their way through an alarm and avoid many discomforts.

METHODOLOGY

Block diagram



II LITERATURE SURVEY

[1] Thanuja C S , Sahana M H , Sindhu G , Shruti B P. (2022). Design of Smart Shoe for the Blind with Cordless Load.

IOT based smart shoe system for the blind people is designed using ultrasonic sensors paired to a Raspberry Pi board. We are provided assistance to the visually impaired included specific hardware devices such as , obstacle detector, GPS tracking. The proposed system helps us in prediction of accidents for blind people, promotes confidence among visually impaired person and It helps to detect obstacles for visually impaired during walking.

[2] Kinnari Tavde , Prof. Vishakha Khambhati. (2021). Smart shoes for blind person.

This paper presents smart shoes for blind person. This smart shoe is easy to use and it creates user-friendly environment for blind person. It is wearable system and it is not expensive. In this, ultrasonic sensor, battery, Arduino Uno and jumper wires are used.

[3] Pradeepa R, Dr. R. Porkodi. (2021). smart shoes for blind using internet of things.

This paper presents various smart shoes for blind technology using Internet Of Things. This paper introduces a thought regarding managing the issues looked by blind people through smart shoes. Smart shoes will help a blind person to mover on independently with help of ultrasonic sensor to detect obstacles.

[4] Asmita Sitaram Kakade, Dr. G. U. Kharat (2020). Smart shoes with navigation system.

Smart shoes is wearable system design to give directional info to visually impaired folks. Throughout the operation, the user is meant to wear the shoes. Once sensors can

discover any obstacle, user are educated through android system getting used by the user. The smart Shoes together with the application on the android system shall facilitate the user in traveling severally.

[5] Hema, Kamala L, Mohan Gowda V, Rajesh S M . (2020). energy efficient smart guidance system for visually challenged persons.

The objective is likely to make a self direction framework which helps outwardly tested (or daze) individuals to walk autonomously. The idea is more about the smart shoes that warn visually disabled people in their ways to challenge which may allow them to move with less collision. The target is to tackle a reliable solution that involves a shoe interacts with users through audio alert. Our key contribution is towards energy efficient self guidancesystem

INTRODUCTION

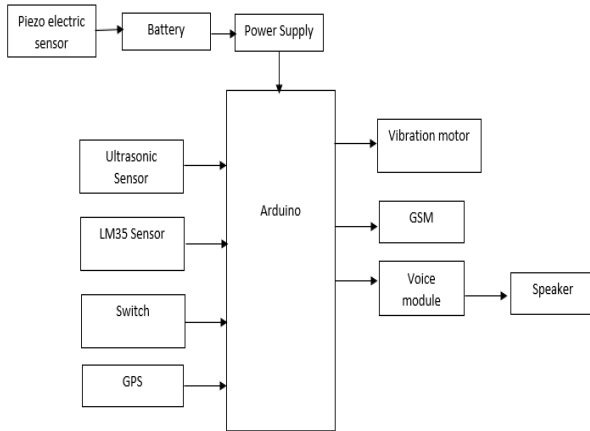
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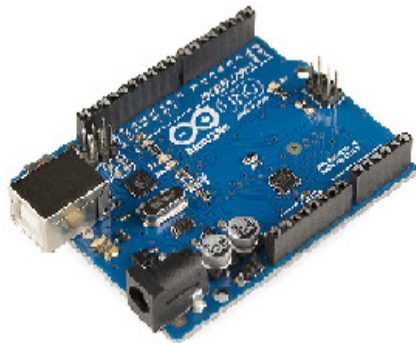
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IV COMPONENTS

ArduinoMega:

The Arduino Uno is an open-source microcontroller board based on the Microchip ATmega328P microcontroller and developed by Arduino.cc. The Arduino Nano has 14 input and output pins, of which 6 are designated as pwm outputs and 6 as analogue inputs. It features every requirement for a microcontroller, as well as a charging port to supply power.

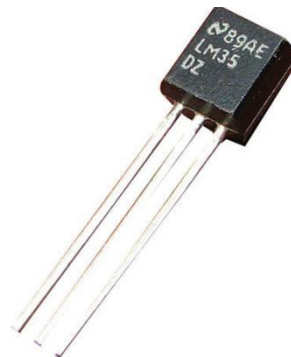


LM35 SENSOR:

LM35 is a temperature sensor that outputs an analog signal which is proportional to the instantaneous temperature. The output voltage can easily be interpreted to obtain a temperature reading in Celsius. The advantage of LM35 over thermistor is it does not require any external calibration. The coating also protects it from self-heating. Many low-end products take advantage of low cost, greater accuracy and used LM35 in their products

ULTRA SONIC SENSOR:

The obstacle distance is measured using an ultrasonic sensor. It is achieved by creating sound waves, which helps to find surrounding obstructions. Following a notation of the wave's return time, the distance is determined. The distance between the sonar sensor and the object can be calculated. (up to a 30 cm distance as of today).



GPS:

Global Positioning System (GPS) is a satellite-based system that uses satellites and ground stations to measure and compute its position on Earth. GPS is also known as Navigation System with Time and Ranging (NAVSTAR) GPS.

GPS receiver needs to receive data from at least 4 satellites for not transmit information the satellites.



SPEAKER:

A Speakers are one of the most common output devices used with computer systems. Some speakers are designed to work specifically with computers, while others can be hooked up to any type of sound system. Regardless of their design, the purpose of speakers is to produce audio output that can be heard by the listener.



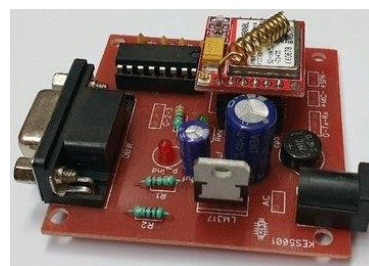
SWITCH:

A Push Button switch is a type of switch which consists of a simple electric mechanism or air switch mechanism to turn something on or off.



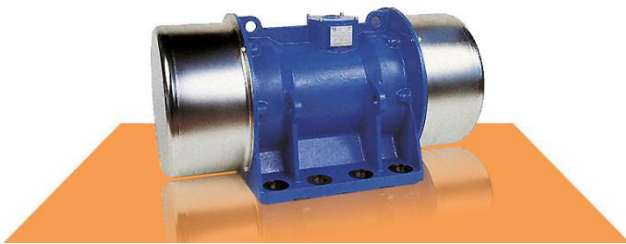
GSMMODULE :

GSM modules are one of the normally utilized correspondence modules in implanted gadgets. A GSM module is utilized to speak with the GSM/GPRS arrange by a microcontroller (or coordinated circuits). A GSM MODEM consolidates a GSM module similarly as various fragments, for instance, correspondence interface, (for instance, Serial Communication-RS-232), control supply and a couple of pointers. A GSM/GPRS module is an IC or chip that utilizes a SIM (Subscriber Identity Module) and Radio Waves to interface with the GSM arrange. Basic radio frequencies are 850MHz, 900MHz, 1800MHz and 1900MHz in which a run of the mill GSM module works.



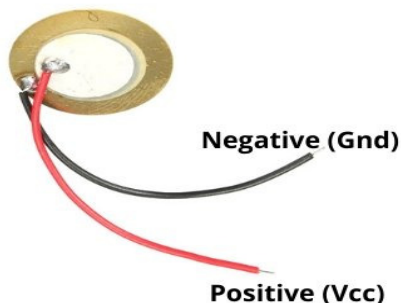
VIBRATION MOTOR:

A vibratory motor is a three-phase motor that is intentionally unbalanced, and is also known as an eccentric rotating mass (ERM) or vibrating motor. Vibratory motors are used to vibrate sieves, troughs and tables, but also to separate products in a bunker or landfill pipe.



PIEZO ELECTRIC SENSOR:

Piezoelectricity is the charge created across certain materials when a mechanical stress is applied. piezoelectric pressure sensors exploit this effect by measuring the voltage across a piezoelectric element generated by the applied pressure they are very robust and are used in a wide range of industrial applications.



PROPOSED WORK

In the proposed method the working behind this multi utility shoe is that it is used for special purpose as a sensing device for the

blind people. It is used widely to detect objects using ultra sonic sensor.

If any object is present, the ultra-sonic sensor detects the object and sends the data to the Arduino. To determine the distance of an object, calculate the distance between sending the signal and receiving back the signal. LM35 sensor will detect the fire. GSM and the GPS are used to detect the location. The piezo electric sensor will generate power and generated power will stored in battery.

V SOFTWARE REQUIREMENT

Arduino IDE:

Arduino IDE where IDE stands for Integrated Development Environment

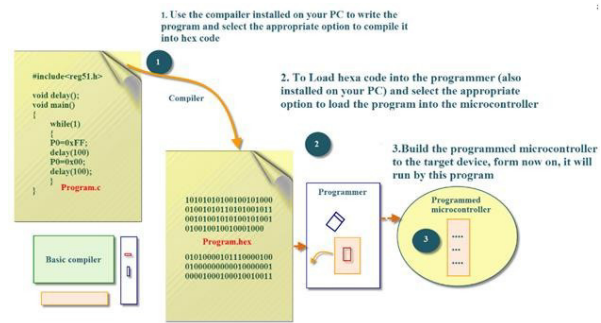
An official software introduced by Arduino.cc, that is mainly used for writing, compiling and uploading the code in the Arduino Device. Almost all Arduino modules are compatible with this software that is an open source and is readily available to install and start compiling the code on the go.

Introduction to Arduino IDE:

- [1] Arduino IDE is an open source software that is mainly used for writing and compiling the code into the Arduino Module.
- [2] It is an official Arduino software, making compilation too easy that even a common person with no prior technical knowledge can get their feet wet with the learning process.
- [3] It is easily available for operating systems like eMAC, Windows, and Linux and runs on the Java Platform that comes with inbuilt functions and commands that play a vital role for debugging, editing and compiling the code in the environment.
- [4] A range of Arduino modules available including Arduino Uno, Arduino Mega, Arduino Leonardo, Arduino Micro and many more.

- [5] Each of them contains a microcontroller on the board that is actually programmed and accepts the information in the form of code.
- [6] The main code, also known as a sketch, created on the IDE platform will ultimately generate a Hex File which is then transferred and uploaded into the controller on the board. The IDE environment mainly contains two basic parts: Editor and Compiler where former is used for writing the required code and later is used for compiling and uploading the code into the given Arduino Module.
- [7] This environment supports both C and C++ languages.

mobilephone, washing machine, digital camera, etc. These all device working is based on microcontroller that are programmed by embedded.



VI ADVANTAGES AND APPLICATIONS

Advantages:

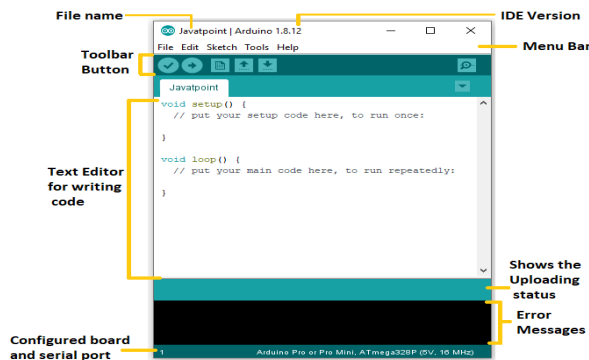
- Water quality monitoring
- Low cost
- Low power consumption
- Easy to access.
- It saves water bill.
- It saves the human time.

Applications:

- Water and Air quality
- Drinking water distributing systems

VII CONCLUSION

The blind people will be able to move from one place to another without others help, which leads to increase autonomy for the blind. The developed smart Shoes that is incorporated with multiple sensors will help in navigating the way while



Embedded C:

- [8] Embedded C is most popular programming language in software field for developing electronic gadgets. Each processor used in electronics system is associated with embedded software.
- [9] Embedded C programming plays a key role in performing specific function by the processor. In day-to-day life we use many electronic devices such as

walking and keep alarming the person if any sign of danger or inconvenience is detected. The developed prototype gives good results in detecting obstacles paced at distance in front of the user; it will be real boon for the blind. At the same time global positioning system (GPS) can be linked with the Smart Shoe for navigation

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