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Research paper

Smart Shoe for Visually Impaired Person

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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. But there are some people who lag this ability of visualizing these things. Due to this, they will undergo a lot of troubles o move comfortably in public places. Hence, wearable device should design for such visual impaired people. A smart shoe is wearable system design to provide directional information to visually impaired people. To provide smart and sensible navigation guidance to visually impaired people, the system has great potential especially when integrated with visual processing units. During the operation, the user is supposed to wear the shoes. When sensors will detect any obstacle, user will be informed through Android system being used by the user. The Smart Shoes along with the application on the Android system shall help the user in moving around independently.

1. Introduction

In this project we propose a smart wearable shoe which is integrated with sensors like ultrasonic ,water and an arduino nano device. Android application will be created which connects the shoe with Bluetooth so that it will assist the user with voice control assistance .

2. Objective

To design a smart shoe for visually impaired so that they can move comfortably with the society despite of any inferiority.

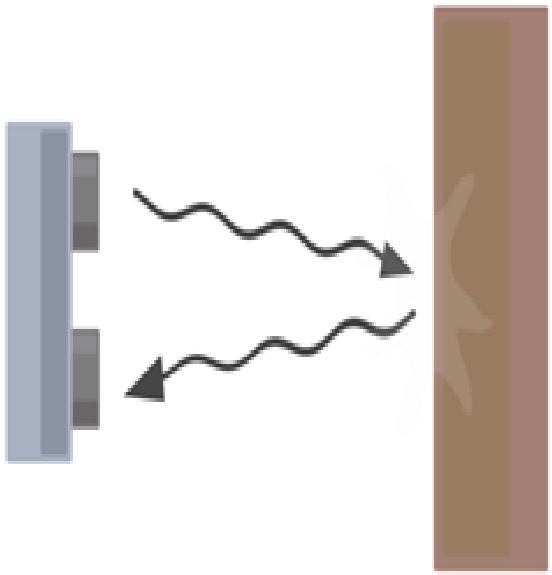
3. Proposed System

The comparably higher accuracy and better comprehensibility, easy to carry.

- An android app is developed to help the user guide them
- Navigation Assistance while travelling.
- Distraction-free travel.
- User friendly system.

A. Ultra Sonic Sensor:

Ultrasonic sensor is used to measure the obstacle distance. It is done by using sound waves generation so that they detect the obstacles nearby. The time for wave to return back is noted down and then the distance is defined. It is possible to calculate the distance between the sonar sensor and the object.(distance up to 30cm till now)



B. Ardunio Nano:

Arduino Nano is a microcontroller board. Arduino nano consists of 14 pins which are classified as input and output pins of which 6 are pwm output and 6 are analog inputs. It has all the specifications that a microcontroller should have and a charging port to power it.

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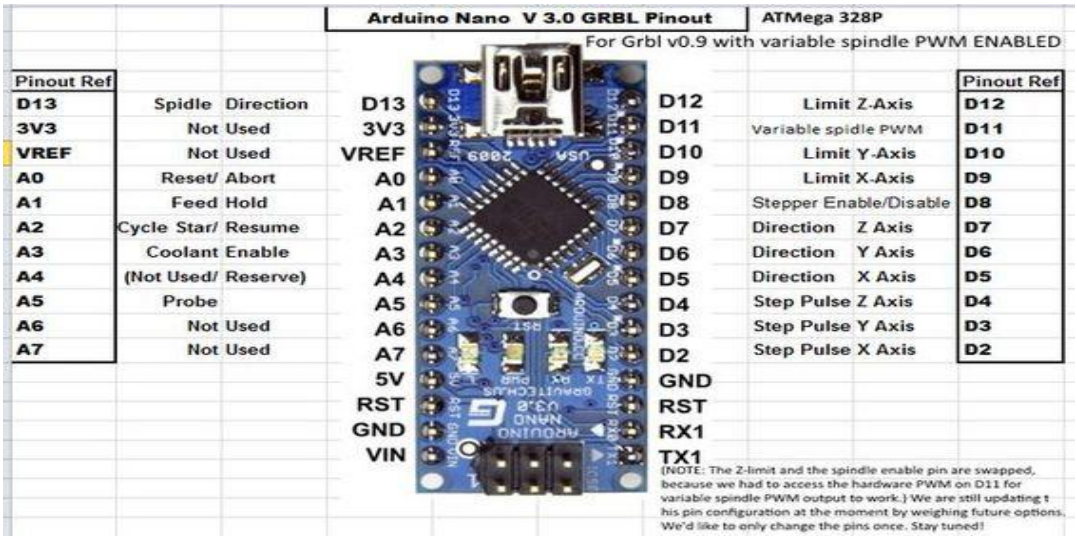
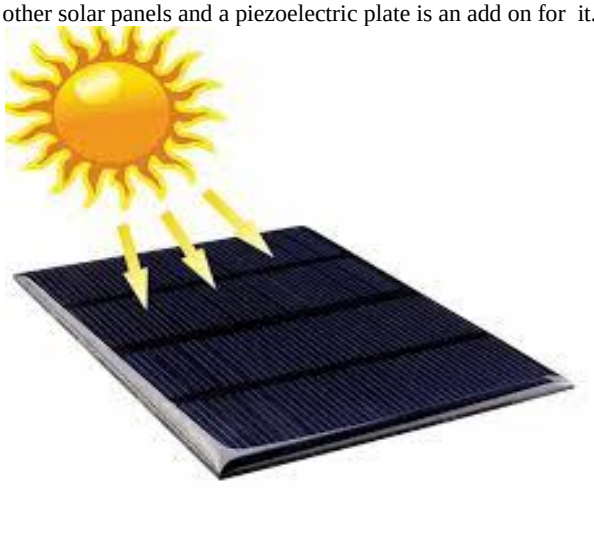


C. Solar Panel:

Solar panel is used in prototype to generate a power of 2watts by using sun rays. The solar panel will have an efficiency of 24% as of other solar panels and a piezoelectric plate is an add on for it.



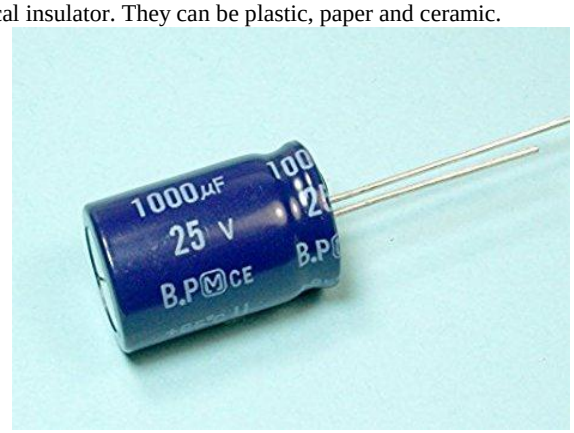
D. Piezoelectric Plate:

It is related to the existence of electric dipole movements in solids. It is similar to the dipole movements occur in cane sugar. The dipole density or polarization may easily be calculated for crystals by summing up the dipole moments and the cell volumes are related.



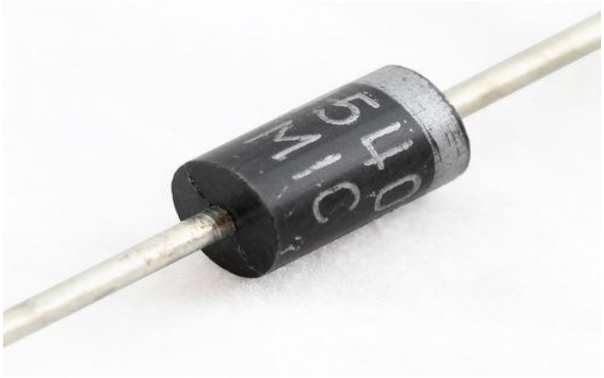
E. Capacitor:

In this prototype the capacitor receives the energy from the solar panel and piezoelectric plate and charges the battery. The features of the capacitor used are 25v and 1000uf. Here a non-conductive area separates two non-conducive regions. The non-conductive region is coined as dielectric which may be either vacuum or electrical insulator. They can be plastic, paper and ceramic.



F. Diode

It directs the energy to the battery from the capacitor and blocks the energy reversal to the circuit. It conducts current only in one direction one side of it has high resistance and other it has low resistance. It is two terminal components.



G. Water Sensor:

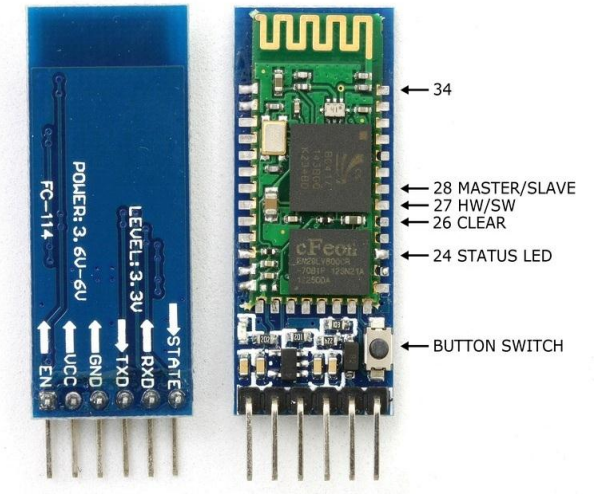
In this prototype we used water sensor module
This is suitable for arduino which gives an alert when drop lets of water come in contact with the sensor it automatically use the

signal so that the user will get the intimation that water is detected. It prevents him from the trouble.



H. Bluetooth Module:

The Bluetooth module used is HC-05,It is a serial port protocol module this help the prototype to connect with the mobile Bluetooth so that the user will get intimation about the obstacles.



I. Emergency Key:

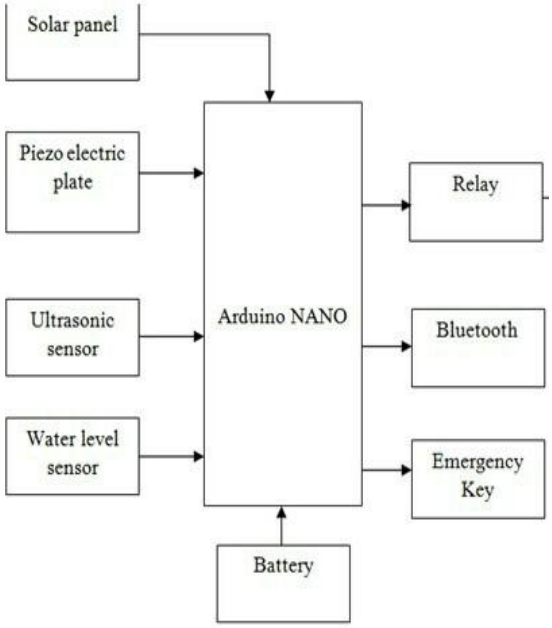
This is a key assembled in prototype so that whenever the key is pressed it sends the location of the connected Bluetooth device to the registered mobile number.



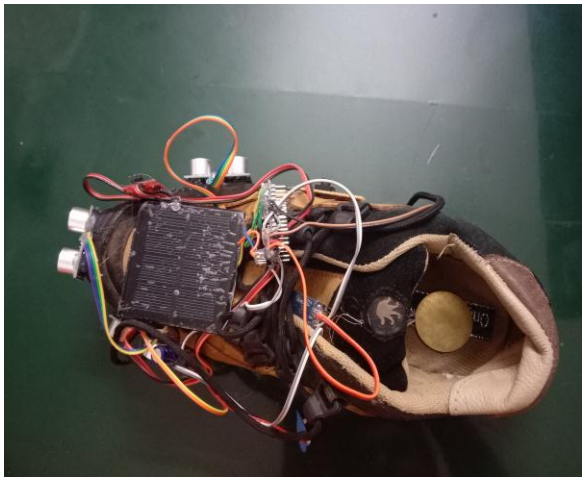
Working

- When the object is detected near to the shoe and if any person coming in front it alerts them with the help of vibratory circuit and also in advancement with help of speakers or head phones that is voice command.
- Here the power supply is main criteria the shoe
- is integrated with self-power generation unit such that there is no power backup problem.

Block Diagram



4. Prototype



5. Software Description

Arduino software is used to run the code which is generated for the requirement of project and an android app is created for the requirement

6. Conclusion

The Smart Shoe for visually impaired persons is a project on embedded systems where he software and hardware were integrated each other so that to create an user friendly environment for he visually impaired persons. Sensors play a major role in this system where they were the major tools for the user guidance, due to this features it is best equipment for the visually impaired persons .hence his project will solve the consequences faced by the visually impaired people.

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