INTEGRATED SMART SHOE FOR BLIND PEOPLE

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ABSTRACT:

This project presents a prototype model and a system concept to provide a smart electronic aid for blind people. This system is intended to provide overall measures object detection, and real-time Assistance via Global Positioning System. The system consist of microcontroller, ultrasonic sensor and a smart phone (GSM Module) and vibratory circuit and Bluetooth unit. This project aims at the development of an Electronic Travelling Aid (ETA) kit to help the blind people to find obstacle free path. This ETA is fixed to the shoe. 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.

1.INTRODUCTION

Blindness, low vision, visual impairment and vision loss have dramatic impacts on individuals experiencing such disabilities. These carry with them physiological, psychological, social, and economic outcomes, hence impacting the quality of life and depriving such individuals from performing many of the Activities of Daily Living (ADL), the most crucial of which is navigation and mobility.

Artificial Vision is the most important part of human physiology as 83% of information human being gets from the environment is via sight. The statistics by the World Health Organization (WHO) in 2014 estimates that there are 285 billion people in world with visual impairment, 39 billion of people which are blind and 246 with low vision. The oldest and traditional mobility aids for persons with visual impairments are the walking cane (also called white cane or stick) and guide dogs. The drawbacks of these aids are range of motion and very little Information conveyed.

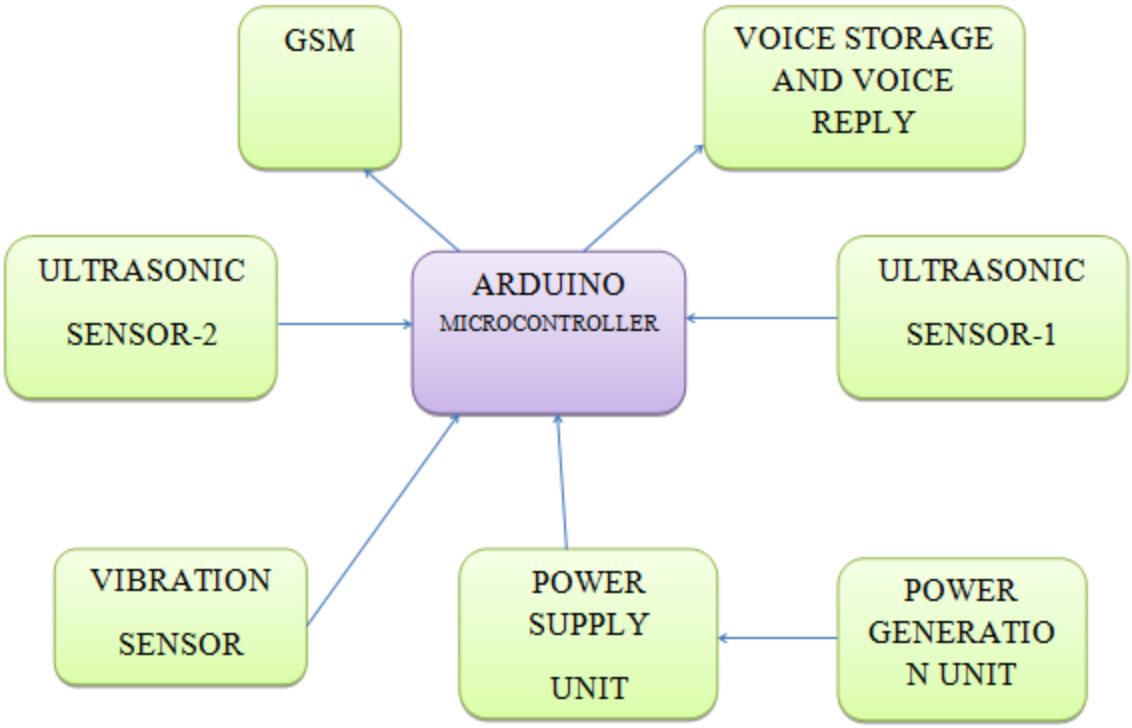
The IR sensor and buzzer will not give accurate result to the blind people, this is the main drawback of previous project, in previous project IR sensor are the object detecting sensor, the problem associated with these reasons and less efficiency and loss the accuracy to detect object and one more problem is it will not provide clean information to blind people.

With the rapid advances of modern technology, both in hardware and software front have brought potential to provide intelligent navigation capabilities. Recently there has been a lot of Electronic Travel Aids (ETA) designed and devised to help the blind people to navigate safely and independently. In this project, the system is has been made as a part of the blind person's shoe and in this project we are using ultra sonic sensor and speaker which provide more accuracy of object detection and given clean information to blind people respectively.

2.METHODOLOGY

This project presents a prototype model and a system concept to provide a smart electronic aid for blind people. This system is intended to provide overall measures object detection, and real-time Assistance via Global Positioning System. The system consist of microcontroller, ultrasonic sensor and a smart phone (GSM Module) and vibratory circuit and Bluetooth unit. This project aims at the development of an Electronic Travelling Aid (ETA) kit to help the blind people to find obstacle free path. This ETA is fixed to the shoe. 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.

3.BLOCK DIAGRAM



3.1 CONCEPT OF WORKING

This project is intended to be developed as tool or aid that will help blind people in moving or travelling. The dependency on others is reduced and these people can become more self-reliant.

The project is built around ARDUINO UNO controller. The project has features to detect obstacles using ultrasonic module . These sensors aremounted on the shoes of the blind person. The person is alerted and will information on the surroundings.

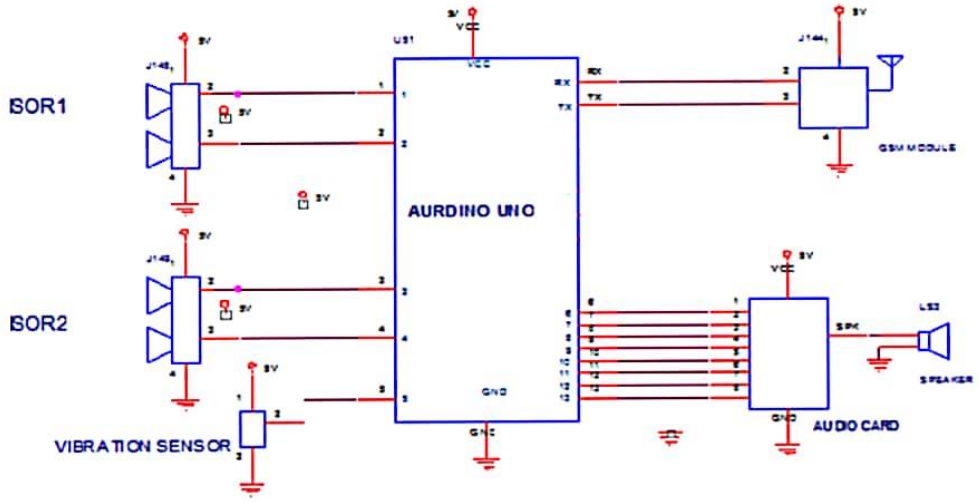
Vibration is used to alert the blind person if there are any obstacles in his path.

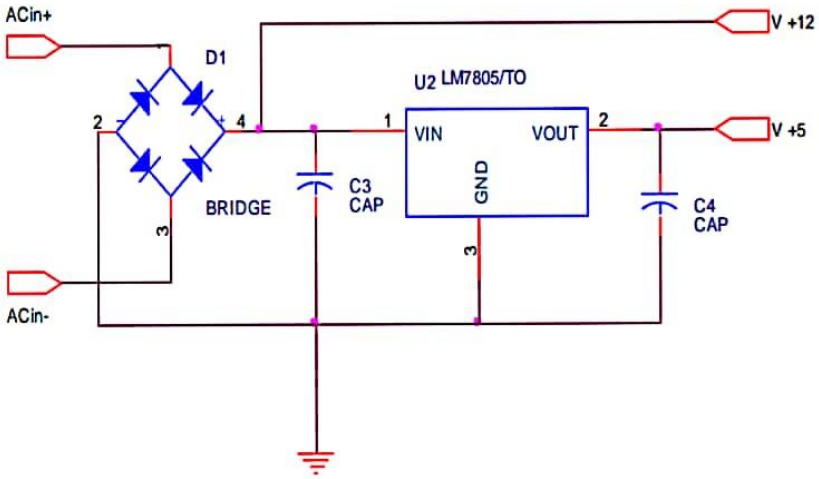
Voice storage holds some recordings and voice reply will produce those recordings to the person with the help of a speaker. Here the frequency of the recordings varies with respect to the distances like if the distance is less the frequency of recording will be high and vice versa.

Power generation unit consist of some piezo electric sensors which will convert mechanical energy(walking) into electrical energy.Thus this energy is supplied to power supply unit which inturn provides the power to the remaining system.

GSM is intended to provide overall measures object detection, human detection and real time assistance which is used along with an android application.

3.2 PHYSICAL IMPLEMENTATION





4.TABLES

4.1 HARDWARE AND SOFTWARE REQUIREMENTS

HARDWARE REQUIREMENTS	S O F T W A R E R E Q U I R E M N T S
Microcontroller Arduino UNO(ATMEGA 328P)	Proteus
Vibration unit(SCR90)	Hyperterminal
GSM(SIM 300)	Arduino IDE software
Voice storage and voice reply(PR33A C2series)	
Ultrasonic sensors(HC-SR04)	
Power suppl(5-12v)	

4.2 EXPERIMENTAL RESULTS

DISTANCE (from the shoe in cms)	TYPE OF SIGNALS
350 to 300	Very slow audio
250 to 200	Slow audio
150 to 100	Audio+Vibration
30 to 20	Fast audio+Vibration

5.CONCLUSION

We would like to conclude that the proposed system completed successfully. as we stated earlier in a problem statement, the previous problem like a less information conveyed, poor efficiency of IR sensor and dependency on stick are overcome and successfully implemented with efficiency of object detection and with a clear information to a blind people for their guidelines.

Hence, it can be concluded that this project is able to play a great contribution to the state of the art and will play a great role to assist the blinds to walk easily.

6.ACKNOWLEDGEMENTS

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