Third eye for blind ultrasonic vibrator glove

Abstract

Third eye for people who are blind is an innovation which helps the blind people to navigate with speed and confidence by detecting the nearby obstacles using the help of ultrasonic waves and notify them with buzzer sound or vibration. They only need to wear this device as a band or cloth.

According to WHO 39 million peoples are estimated as blind worldwide. They are suffering a lot of hardship in their daily life. The affected ones have been using the traditional white cane for many years which although being effective, still has a lot of disadvantages. Another way is, having a pet animal such as a dog, but it is really expensive. So the aim of the project is to develop a cheap and more efficient way to help visually impaired to navigate with greater comfort, speed and confidence.

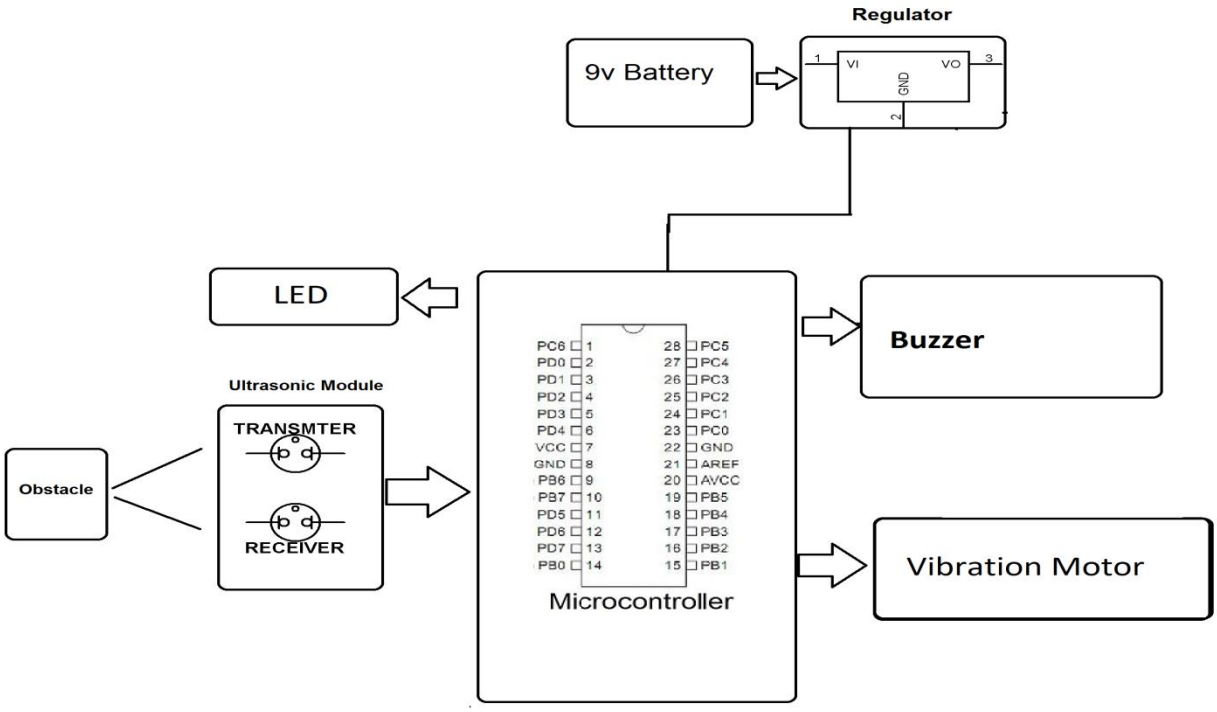
Introduction

The “Third Eye for Blind with Vibrating Ultrasonic Glove”, is designed to help the blind to overcome the lack of visual sense, by using other senses like sound and touch. It uses audio and vibration signals to notify the user about upcoming hurdle. As the distance between glove and obstacle decreases, frequency of both audio and vibration signals increases. Thus the system helps to ease the navigation process for the needy.

The system uses microcontroller, which is a high performance 8-bit AVR RISC-based microcontroller. It has 32KB of ISP flash memory with read-while-write capabilities, as well as 1KB EEPROM, 2KB SRAM. It also has features like, 23 general purpose I/O lines, 32 general purpose working registers and three adjustable

timer/counters with compare modes. For sensing the distance the system uses a HC-SR04, a Ultrasonic Range Finder Distance Sensor Module. The sensor module is designed to measure the distance using the principle of SONAR or RADAR, of using ultrasonic wave to determine the distance of an object. The system also consist a buzzer to generate an alarm sound and a motor to generate vibration signals.

Block diagram



Component

Hardware

- Microcontroller
- Ultrasonic Sensor

- Crystal Oscillator
- Resistors
- Capacitors
- Transistors
- Cables and Connectors
- Diodes
- PCB and Breadboards
- LED
- Transformer/Adapter
- Push Buttons
- Switch
- IC
- IC Sockets
- Vibrator Motor
- Gloves

Software Specifications

- Language: C

Advantage

It is proposed to provide constructive assistant and support for the blind and visually impaired persons. The system will be efficient and unique in its capability in specifying the source and distance of the objects that may encounter the blind. It is able to scan and detect the obstacles in the areas like left, right, and in front of the blind person regardless of its height or depth. With the proposed architecture, if constructed with at most accuracy, the blind will be able to move from one place to another without others help.