
SMART STICK FOR THE BLIND PEOPLE

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ABSTRACT

Blind person finds it difficult to detect the presence of any obstacles in their way while moving from one place to another. The smart stick comes as a proposed solution to help the visually impaired people in their day to day living without the help of others. In this paper we proposed a solution for the blind people by using an ultrasonic sensor in the blind stick. Thus the radio frequency transmitter and receiver help the user to find the exact location of the smart stick with the help of buzzer.

The vibration motor which is placed in the smart stick gets activated and produces a vibration when any obstacle is detected. This proposed method uses the Arduino UNO as controller. The branch is accomplished of sensing all difficulties in front of the user. The smart stick is of user friendly, quick response, very low power consumption, lighter weight and it is easy to hold and fold by the user.

Keywords: Arduino UNO, Ultra Sonic Sensor.

I. INTRODUCTION

Visually impaired persons have difficulty to interact and feel their environment. They have little contact with surrounding. Physical movement is a challenge for visually impaired persons, because it can become tricky to distinguish where he is, and how to get where he wants to go from one place to another. To navigate unknown places he will bring a sighted family member or his friend for support. Over half of the legally blind people in the world are unemployed. Because limited on the types of jobs they can do. They have a less percentage of employment. They are relying on their families for mobility and financial support. Their mobility opposes them from interacting with people and social activities. In the past different systems are designed with limitations without a solid understanding of the non-visual perception. Some of the systems are only for indoor navigation, and has no hurdle detection and determining location feature in outdoor environment. Researchers have spent the decades to develop an intelligent and smart stick to assist and alert visually impaired persons from obstacles and give information about their location Over the last decades, Research has been conducted for new devices to design a good and reliable system for visually impaired persons to detect obstacles and warn them at danger places. There are some systems which has some deficiencies

Problem Definition:

To design a device for visually impaired people that detects any object in front of it and alerts or makes the user realize that there is an object in front of them. And a light which glows when it is dark so that he gets noticed.

Objective of Project:

The objective of this project is to build a blind man stick that can detect obstacles, potholes and thus help the blind person travel independently.

- The ultrasonic sensor helps to detect any obstacle.
- The buzzer then produces a sound after detecting the obstacle.
- The intensity of light and the light glows when intensity is low in the dark which it alerts the other person that there is a blind person in front of him

II. LITERATURE SURVEY

As a part of literature survey, we investigated some the smart stick for the blind people that already exist in market. The aim is to help the blind people

[1] proposed a Smart Walking Stick which is an Electronic Approach to Assist Visually Disabled Persons. Their device is a micro controller based automated hardware that can assist a blind to detect obstacles in front of him/her promptly. The hardware consists of a micro controller PIC16F690 incorporated with ping sonar sensor, proximity sensor, wet detector, a GH311 Ultrasonic obstacle sensor, a micro pager motor and additional equipment. The simplicity of the proposed design makes it easy to use by any person and at the same time the cost of manufacturing such sticks is kept low. The power consumption of the proposed stick is low and can be operated easily. It is also very cheap compared to the conventional ones. Obstacle and hole can be determined easily by sensor readings. The design has an added vibratory feedback mechanism necessary for creating vibratory signal for multiple disable persons to get precise information from the output. Also, the Micro controller can be code-protected so that its security cannot be overridden except by the user or vendor.

[2] proposed Smart White Cane which is a Sophisticated and Economic Walking Aid. Their proposed stick is designed to detect obstacles which may help the blind to navigate carefree. Their device is made up of components such as ATmega328PU micro controller, 4 HC-SR04 Ultrasonic Sensor Modules, Sound IC-APR33a3, Vibration Motor, and battery. The stick can detect pits, potholes, downfalls, staircase (up and down), low lying and knee level obstacles and even those above the waist. The stick does not have the ability to detect oncoming vehicle, slippery floor, and there is no fire smoke alarm. The idea behind the design of the stick was to keep it structurally similar i.e. thin, lightweight and easy to handle, yet give an active feedback to the user regarding hazards in his walking path.

Existing System:

S. Gangwar(2011) designed a smart stick for blind which can give early warning of an obstacle using Infrared (IR)sensors. After identifying the obstacles, the stick alerts the visually impaired people using vibration signals.

Disadvantages of Existing System:

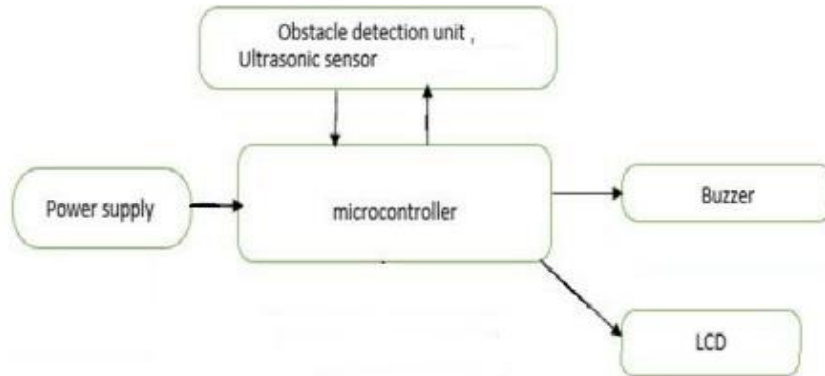
- it can detect only the nearest obstacle in short distance.
- The IR sensors are not really efficient enough
- More costly.

III. PROPOSED SYSTEM

Obstacles ahead using ultrasonic waves. On sensing obstacles the sensor passes this data to the micro controller. The micro controller then processes this data and calculates if the obstacle is close enough. If the obstacle is not that close the circuit does nothing. If the obstacle is close the micro controller sends a signal to sound a buzzer. It also detects and sounds a different buzzer if it detects water and alerts the blind. It is embedded as part of a complete device often including hardware and mechanical parts. Embedded systems control many devices in common use today

Specifications:

The design of a Smart Stick system for the disabled is explained in terms of structure and interaction with external entities. The diagram of the proposed system showing in schematic and simplified form, various components used in the design and implementation of the smart stick. The diagram shows the general arrangement of the parts of the system components and how they connect

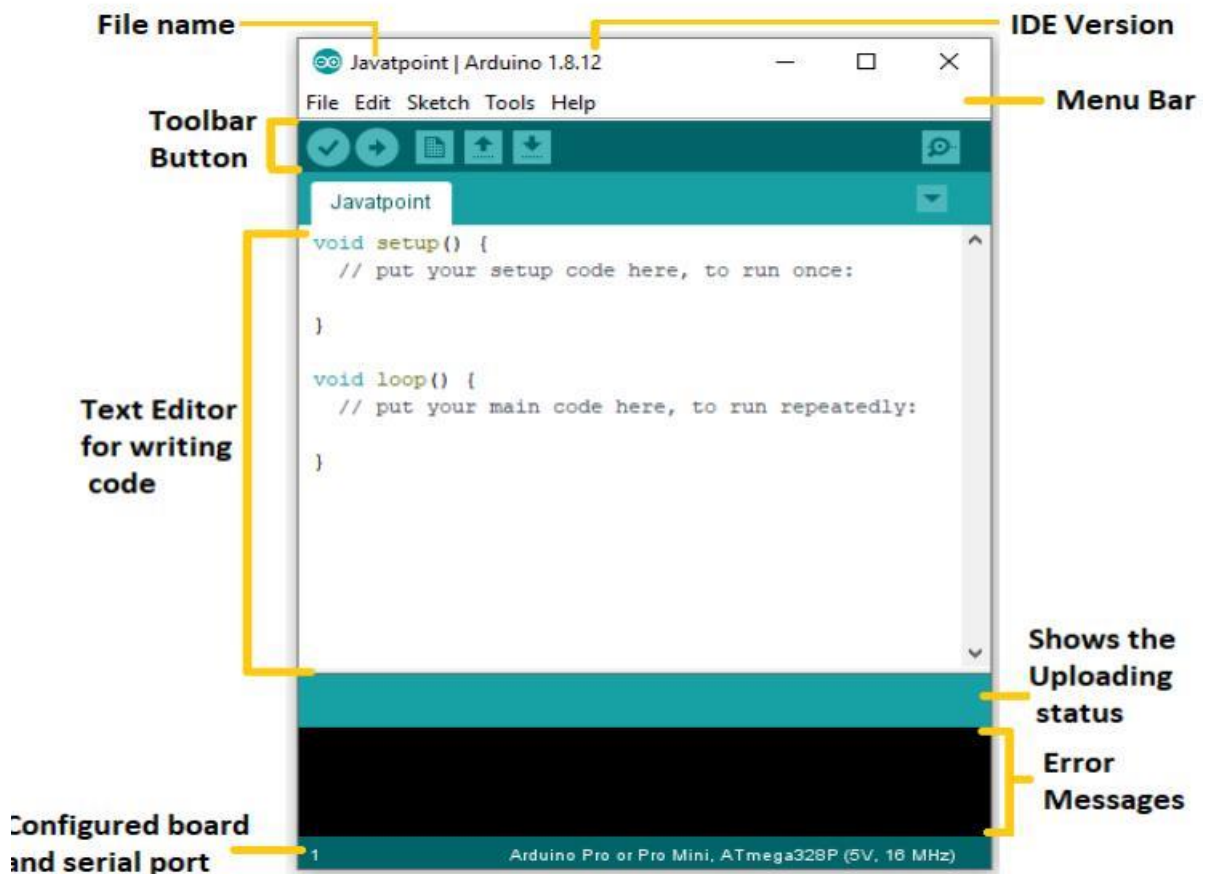


IV. REQUIREMENTS SPECIFICATIONS

This document describes the software requirements and specification for an smart stick.

Software Requirements

Arduino IDE

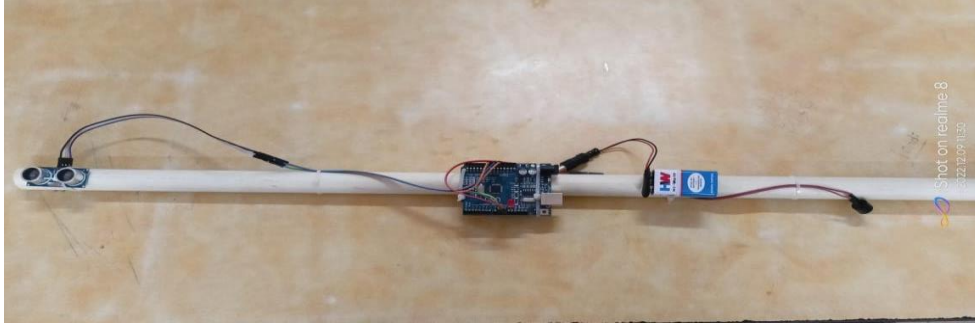


Hardware Requirements

- Ultra-sonic sensor
- Buzzer
- Led light
- Jumper wires
- Arduino Uno

V. IMPLEMENTATION

PROTOTYPE:



VI. RESULT

Test Case 1: When No Object Is Detected



When there is no object in detected in front of the blind person the buzzer will not produce any sound. When the distance between the sensor and the obstacle is less than 100 cm the ultrasonic sensor will detect the object and the buzzer will produce sound.

Test Case 2: When Object is Detected



Whenever the distance between the object and the ultrasonic sensor is less than 100 cm ,the buzzer will produce a sound which will alert the blind person.

VII. CONCLUSION

- The smart stick as a basic platform for the coming generation of more adding devices to help the visually impaired to navigate safely both indoor and outdoor. It is effective and affordable
- It leads the good result in detecting the obstacles on the path of the user in a range. This project offers low cost, reliable, portable, low power consumption and robust technology for navigation with obvious short response time.
- In this project, different types of sensors and other component with the light weight.

VIII. REFERENCES

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