

SMART BLIND STICK

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ABSTRACT

This project aims at providing the theoretical model which incorporates the latest technologies to provide efficient and smart electronic aid to the blind. The smart stick that will make the visually impaired person guiding their way. The smart stick having capability to detect the obstacle and communicate the person smartly through speaker or vibration rhythm through vibrator motor and help the blind. We have used ultrasonic range finder circuit for hurdle detection through the ultrasonic waves produced by it and this is interfaced with the vibrator which vibrates on detecting an obstacle. Bluetooth module which along with GPS technology and an Android application for blind, will provide voice assistance to desired location and in panic situations will send SMS alert to registered mobile numbers on pressing on a button whenever he feels he is lost. The basic objective of the system is to provide a convenient and easy navigation aid for unsighted which helps in artificial vision by providing information about the environmental scenario of static and dynamic objects around them and also helps a blind to live a better life.

Keywords: *Ultrasonic sensor, Bluetooth module, Android Application, Arduino Microcontroller, Visually impaired.*

1. INTRODUCTION

Presently, blind people use a white stick as a tool for direction, when they move or walk. Here, we develop a tool which can serve as a blind stick being more efficient and helpful than the conventional one. Vision is one of the most important senses of as most of the information humans gets from the environment is via sight. The basic problem which every blind person faces is with regard to commutation and navigation in daily life. The most commonly used tool is still the blind stick. It suffers from drawbacks like lots of practice, range of motion, less reliability in terms of dynamic hurdles and also range detection. We will try to modify this cane with electronic components and sensors. The ever growing technology and with recent developments can help in artificial and accurate navigation. Our model uses GPS technology along with Bluetooth module which then will initiate an android application which will connect to Google maps for navigation. In addition we have used ultrasonic sensor which help in obstacle detection and on hurdle recognition will ring the speaker for different durations to indicate different distances. We wish at presenting an inexpensive and light weight and accurate model which helps in effortless navigation for the blind. Distress mechanism will send locations of longitude and latitude to preregistered mobile numbers in situations of panic.

2. Literature Survey

Blind Aid Stick has been a popular project with constant enhancements and modifications. Currently the commercially available of blind stick are not that popular due to high cost and lack of accuracy. Previous projects on the same idea - Niranjana Debnath and Shashank Chaurasia. [1] Mobility for the blind is always a great problem. Just like a sighted, blind also needs to travel around inside a closed premise like house, factory, office, school etc. They may also like to go for shopping, visiting friends and other places of their interest Presently available electronic travelling aids like sonic path finder, sonic torch etc. are not suitable for using inside a closed premises such as

school, factory, office etc. [2] Independence is the building methodology in achieving dreams, goals and objectives in life. Visually impaired persons find themselves challenging to go out independently. There are millions of visually impaired or blind people in this world who are always in need of helping hands. For many years the white cane became a well-known attribute to blind person's navigation and later efforts have been made to improve the cane by adding remote sensor. Blind people have big problem when they walk on the street or stairs using white cane, but they have sharp haptic sensitivity. The electronic walking stick will help the blind person by providing more convenient means of life. The main aim of this paper is to contribute our knowledge and services to the people of blind and disable society.

2.1 Existing System

The different duration buzzer further improves the efficiency and reduces complication. The project can further be modified to increase ranges for obstacles and as the GPS technology continues to grow the accuracy will improve. The Advancement in Mobile technology will further help in developing better applications for continuous assessment of surroundings. Major drawback of infrared sensors is their nonlinear response i.e. a big change in output voltage does not always indicate a big change in range. The model can further improved by employing the small comparable solar cell, so that the user will not bother about recharging the battery. As it has GSM module, an earphone piece can be attached so that the impaired person can speak to the programmed number along with sending SMS. One demerit found in this model when the GPS module not getting the satellite signal or the person is in indoor region the SMS can give wrong information.

2.2 Proposed System

- Light weight components integrated to the stick which makes it user friendly.
- Fast response of obstacles in near range and up to 200 cm using Ultrasonic sensors.
- Avoidance confusion by playing comprehensible speech message.
- Detection of stairs and its direction (upward and downward) stairs
- Low power consumption and battery life up to 14 hours before recharge.

3. System Design

System design is a blueprint of the solution for a system. Design of the system can be defined as the process of applying various techniques and principles for the purpose of defining a process are a system in sufficient details to permit its physical realization. System design is concerned with how the system functionalities must be provided by the different components of the system. Thus, system design is a "how to" approach to the creation of a new system.

3.1 System Architecture

Architecture focuses on looking at the system as a combination of many different components, and how they interact with each other to produce the desired result. The focus is on identifying components or subsystems and how they connect. In other words, focus is on what major components are needed.

The 3 tier in the three tier architecture are:

- Presentation Tier: Occupies the top level and displays information related to services. This replaces the interaction.
- Logical Tier: Also called middle tier, application tier, business logic or logic tier. This tier is pulled from the presentation tier. It controls application functionality by performing detailed processing.
- Data Tier: Database server where information is stored and retrieved. Data in this tier is kept independent of application servers or business logic.





 <p>Android Application</p>	<p>Presentation Tier</p>
 <p>Bluetooth®</p>	<p>Logical Tier</p>
 	<p>Data Tier</p>

Fig: 3.1 Architecture Diagram

4. CONCLUSIONS

This paper hence presents the system design and concept of a smart and easy to use Blind Aid Stick for the visionless .The key features are the simple design, efficient yet easy to use and modify architecture and system design. Hence it can provide a low cost device for millions of blind people in the entire world. The proposed system combines various existing easily technologies and real time system sensors that help in monitoring the position of user and also help in effortless navigation. The different duration buzzer further improves the efficiency and reduces complication. The project can further be modified to increase ranges for obstacles and as the GPS technology continues to grow the accuracy will improve. The Advancement in Mobile technology will further help in developing better applications for continuous assessment of surroundings. Technology of Wi-Fi and can also be include along with IOT so that features like Whether and traffic prediction can help the blind to further evaluate better.

5. REFERENCES

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