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Smart Blind Stick

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Abstract: **The Blindness is a very common disability among the peoples throughout the world. According to the World Health Organization (WHO) 285 million people are visually impaired worldwide, 39 million are blind and 246 have low vision. About 90% of the world's visually impaired live in developing countries. In normal stick, the detection of the obstacle is not done and normal stick is not efficient for visually impaired persons. Hence, we Proposed the innovative stick called smart blind stick. We achieve this by using a few sensors and Modules. The stick, with the help of an Ultrasonic sensor and IR sensor detects the obstacle the blind person is approaching. Also, Water sensor is used to detect the water and gives the signalling by vibrating with the help of vibration motor and also provides sound by using buzzer. We take the benefits of GPS module and GSM module, where GPS module helps to trace the blind person using the data collected by it. In case of dangerous circumstances, the SOS button is integrated on a stick if a blind person can just click on the SOS button, then the person whose phone number has been saved is notified that the blind person is at risk, along with the current location of the blind person. All these features are beneficial in lending a hand to make the visually impaired people become self-reliant while navigating.**

Keywords: Smart Blind Stick, Sensors, GSM, Microcontroller, GPS, SOS button.

I. INTRODUCTION

An embedded system can be defined as a computing device that does a specific focused job. Appliances such as the air-conditioner, VCD player, DVD player, printer, fax machine, mobile phone etc. are examples of embedded systems. Each of these appliances will have a processor and special hardware to meet the specific requirement of the application along with the embedded software that is executed by the processor for meeting that specific requirement. The embedded software is also called "firm ware". The desktop/laptop computer is a general-purpose computer. You can use it for a variety of applications such as playing games, word processing, accounting, software development and so on.

II. OBJECTIVE

The main objective of our project is to provide smart sticks that can avoid obstacles and provide navigation to visually impaired people GPS so that they can move independently in unfamiliar environments.

III. LITERATURE SURVEY

This is a study of the relevant literature on a given topic. In order to understand the development of a Smart blind stick, we need to look at the existing technology. A brief study and survey were conducted to understand various problems related to the project, among blind people who have difficulty in walking on the street.

Here are some literature references "Intelligent walking stick for the visually impaired "[1], "Implementation of a smart cane for obstacle detection, Detection and Navigation."[2]. "An electronic walking stick for the blind" [3], "Advanced cane for the blind for visually impaired people" [4], "The prevalence and causes of visual impairment and blindness among older adults in the city of Lodz, Poland."[5].

For the improvement and safety of the blind society, a variety of electronic tools and different technologies have been used to guide them through the detection of obstacles on the ground, uneven surfaces, holes, steps, and puddles.

IV. IMPLEMENTATION

In our prototype, we build this smart blind stick using Arduino UNO. It is used to control all the sensors and modules (GSM & GPS). The blind stick is integrated with ultrasonic sensor along with IR and water sensor. Our proposed project first uses ultrasonic sensor to detect obstacles ahead using ultrasonic waves. IR sensor is mounted at the bottom of the stick helps in detecting the stair case ahead using infrared waves. Water sensor is mounted at the bottom of the stick helps in detecting the water on surface of the floor. These three sensors detect and gives signaling through vibration motor and buzzer. GPS module helps to trace the blind person using the data collected by it. The SOS button is integrated on a stick if a blind person can just click on the SOS button, then the person whose phone number has been saved in the code memory get notified that the blind person is at risk, along with the current location of the blind person with the help of GSM Module. The Power Supply should be given to Arduino and GSM Module through adapters.

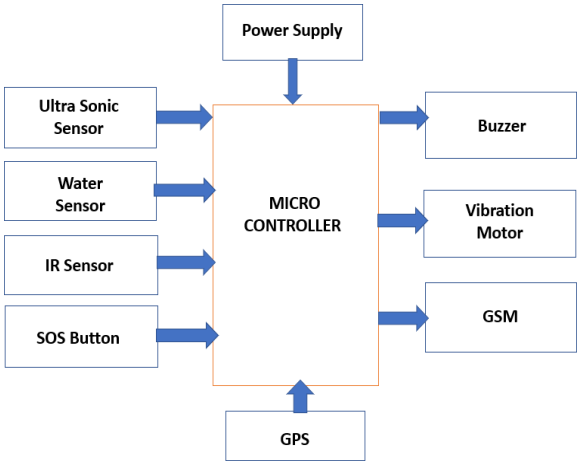

Fig 1: Block Diagram

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V.RESULT

Fig 3: Front View of Proposed Prototype

The design of Smart bind stick shown in fig: 3 The stick uses different types of sensors which is mounted the stick so that the blind person can detect And we also mounted the GSM and GPS module. By this module the blind person can share their location and alert message to any one of their family member's through clicking the SoS button which is also mounted on stick. The alert message is show in below fig.4

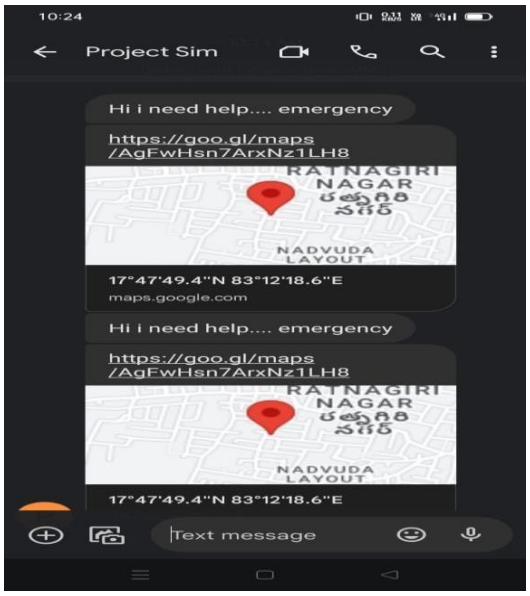

Fig 4: The message received to the mobile numberprovided in the code.
(After pressing the SOS Button)

CONCLUSION

The Smart Stick serves as a basic platform for the next generation of assistive devices to help the visually impaired to navigate safely inside and out. It leads to good results in finding obstacles in the user's path with the help of ultrasonic sensor and IR sensor and Water sensor is used to detect the water and gives the signaling by vibration motor and buzzer. We take the benefits of GPS and GSM module, where GPS module helps to trace the blind person using the data collected by it. In case of dangerous circumstances, the SOS button is integrated on a stick if a blind person can just click on the SOS button, then the person whose phone number has been saved get notified that the blind person is at risk, along with the current location of the blind person. All these features are beneficial in lending a hand to make the visually impaired people become self-reliant while navigating.

FUTURE SCOPE

The smart blind stick can be trained by using machine learning techniques for more number of objects which in turn would help the blind person to move around in various neighbourhoods with increased level of safety. Also, the voice sensor can be used for give instructions to the model from user and by using sound sensor instruction given by model can be received by user. In the future, the integrated stick is being folded and portable to use. These changes can increase the safety and convenient to use for the Blind people.

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