

# Intelligent System for Visually Impaired People Using Android

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**Abstract:** God gifted sense of vision to the human being is an important aspect of our life. But there are some unfortunate people who lack the ability of visualizing things. The visually impaired have to face many challenges in their daily life. The problem gets worse when they travel to an unfamiliar location. Visually impaired people use their senses like touch or sound for walking in a particular area, which is not possible for outdoor walking. Blind people are prone to sweep or knock whatever obstacle which pass before them during walking, subjecting them to risk of injury caused from fall. Our project aims to develop a smart stick for the visually impaired people. The smart stick will include a GPS/GSM system and obstacle detection mechanism. The GPS system is used by the user to know the current location and also to notify his friend or relative about the current location. The system is also comprise of LED lights for avoiding accidents during evening or night time and an ultrasonic sensor as input for detection of obstacles and Buzzer sound as the output for user. This could result in a better movement of the user.

**Keywords:** sweep, GPS/GSM, obstacle detection mechanism, LED, ultrasonic sensor

## 1. Introduction

In today's lifestyle, technology has become very dependable in many ways thereby simplifying day-to-day life. As age of human beings increase most of the people lose their eye sight nowadays, they face more problems in their daily routine life. One such example is persons with low visibility, who can't operate mobiles in the emergency conditions whenever they need help from required persons, (requirement of doctor). Aged peoples with blindness find problem while walking, such as unable to view obstacle at a close distance in front of them which may inflict injuries to one-self.

To overcome these such problems faced by low sight by old aged people, we have come up with a solution which helps them to walk freely and fulfill their requirements using speech reorganization and intimate to the person by text message with the area where the patient is, and calling to specified persons. This paper informs the user through Text message and map, it will give the current location of patient for caretaker by using GPS. Along with this another feature is also added such as sensing the lighting condition in the room and illuminating an LED lamp automatically.

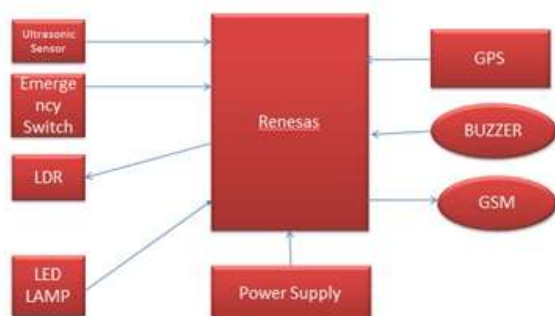


Figure: Proposed System Architecture

“Electronic Stick and Android Smart phones to the Aid of Blindly Disabled Individuals”, aims at providing a proper navigation for individuals suffering from blurred vision and blindness, which happens due to ageing factor. Many embedded systems have substantially different designs according to their functions and utilities. In this paper design, structured modular design concept is adopted and the system is mainly composed of a Renesas microcontroller, LDR, LED driver, LED lamp, Ultrasonic sensor, GSM, GPS, Buzzer, Emergency Switch.

## 2. Literature Survey

- An efficient, reliable, robust and secure health flow is important to manage patients, their health records smoothly and for the right care to reach to the patient at any time.
- Smart walking stick for visually impaired [1] incorporates artificial vision and object detection integrated with GPS to enable the user to know about the environment for efficient navigation. Although it is an advanced technology, lack of voice recognition to input the destination is a disadvantage to this system.
- Blind Aid using Radio Frequency Identification (RFID) and Ultrasonic sensors [7] uses RFID technology and ultrasonic sensors to help in improved navigation, but RFID has its own constraints like interference and complexity due to RFID tagging of every object in the vicinity.
- Obstacle detection gadget for visually impaired people [5] obstacle detection system proposed is based on infrared and the output is provided by buzzers and vibrators. This system is used for indoor obstacle detection.

## 3. Proposed System

### • Obstacle Detection using ultrasonic sensor:

This component shall help the user avoid obstacles in the range of 0-4 feet by beeping differently depending on the

position and proximity of the obstacle detected. The ultrasonic sensors are used which transmit ultrasonic waves and receives the response that are reflected by the obstacles around continuously. The response is analyzed by the microcontroller to measure the distance between the user and the obstacle. This triggers the corresponding output, which is a buzzer sound mentioning the direction of the obstacle to alert the user over the speaker.

**• Navigation Aid using GPS:**

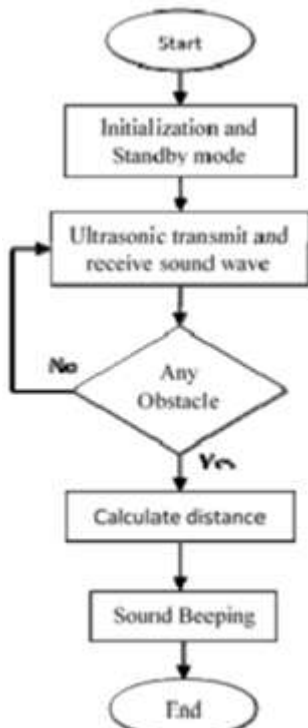
This component shall help the user navigate to the chosen destination by alerting the person about the current location when the emergency button is pressed. GPS is used to extract the current coordinates of the user which shall be input into the microcontroller to compare with the data stored in the SD card. Once a match of the coordinates is found the location name corresponding to the coordinates is announced. These announcements are made using text to speech conversion in the microcontroller.

**• Location Detection using GSM:**

In case of an emergency, when the user wishes to alert his friend or relative, the user on pressing the alert button, the current location coordinates received from the GPS system will be sent via SMS. The SMS sent will include the Google maps URL link to which the coordinates of the blind user are appended. When the friend or relative taps on the link, the person is automatically redirected to Google maps showing the coordinates of the blind user.

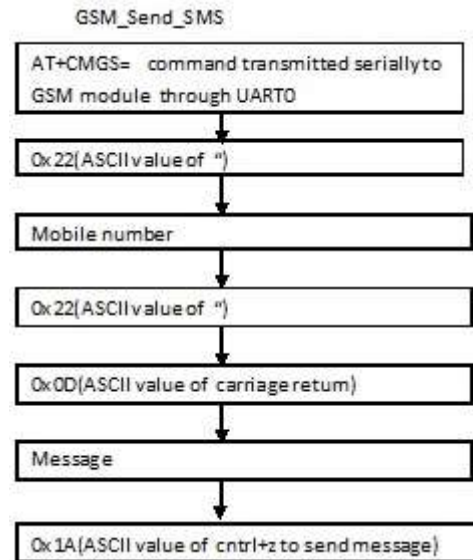
**• Accident avoidance using LED lights :**

When the surrounding light is less than 60% (during evening or night time) or LDR value  $\geq 3.00$ , the LDR sends the signals to the microcontroller, then the LED lights will ON automatically. It is the indication for opposite side vehicles to avoid the accidents during evening or night time



**Figure:** Flow chart of the ultrasonic sensor

Ultrasonic sensor provides a very easy method of distance measurement. This sensor is perfect for applications that require you to perform measurements between moving or stationary objects. Naturally, robotics applications are very popular but it is also useful in security systems or as an infrared replacement. Ultrasonic sensors or ultra-motion detectors are an electronic kit that contains many sub electronic circuit in it and has many applications



**Figure:** The Flow of GSM message sends for caretaker

Global system for mobile communication (GSM) is a globally accepted standard for digital cellular communication. GSM is the name of a standardization group established in 1982 to create a common European mobile telephone standard that would formulate specifications for a pan-European mobile cellular radio system operating at 900MHz. It is estimated that many countries outside of Europe will join the GSM partnership.

**4. Results and Discussions**

The proposed system tries to eliminate the flaws in the previous system. It aims to solve the problems faced by the blind people in their daily life. The system also takes measures to ensure their safety

**5. Conclusion**

The purpose of the proposed work is to come up with a product that acts as an aid to the visually impaired people. By analyzing the existing aids and coming up with our own idea to make a better aid, mainly three modules obstacle detection, location tracking and SMS alert were concentrated

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