



## IOT BASED WALKING STICK FOR VISUALLY IMPAIRED USING RASPBERRY PI

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### ABSTRACT:

*A Smart stick system concept is devised to provide a smart electronic aid for blind people. Blind and visually impaired people find difficulties in detecting obstacles during walking in the street. The system is intended to provide artificial vision and object detection, real time assistance via GPS by making use of Raspberry Pi. The system consists of ultrasonic sensors, GPS module, and the feedback is receive through audio, voice output works through TTS (text to speech). The proposed system detects an object around them and sends feedback in the form of speech, warning messages via earphone and also provides navigation to specific location through GPS. The aim of the overall system is to provide a low cost and efficient navigation and obstacle detection aid for blind which gives a sense of artificial vision by providing information about the environmental scenario of static and dynamic object around them, so that they can walk independently.*

Keywords—Raspberry Pi, Ultrasonic sensor, GPS Module, Earphone

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### [1] INTRODUCTION

People who are visually impaired are living a life contingent on other people. According to world health organizations, global data on visual impairment states that; the number of visually impaired people, of all ages, is estimated to be 285 million, of whom 39 million are blind. 80% of the people above 50 years of age are blind. Vision is the most important part of human physiology as 83% of information human being gets from the environment is via sight. People with those afflictions are facing a lot of pain to live a normal life.

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Eye sight plays a major role in collecting most of the information from the real world and that information will be processed by brain, visually impaired people suffer inconveniences in their daily and social life. Blindness or visual impairment is a condition that affects many people around the world. This condition leads to the loss of the valuable sense of vision. Worldwide there are millions of people who are visually impaired, where many of them are blind. The need for assistive devices was and will be continuous. There is a wide range of navigation systems and tools existing for visually impaired individuals. The blind person truly requires an identifying objects

### [2] OBJECTIVE

The main objective of our project is to provide a voice based assistance to blind people. Here we have developed an intelligent system that helps blind person to travel independently and works efficiently. Current navigation device for the visually impair focus on travelling from one location to another. Our project focuses on designing a device for blind people that help them to travel independently and also it must be comfortable to use. The proposed device is used for guiding individuals who are blind or partially sighted. The device is used to help blind people to move with the same ease and confidence as a sighted people.

- To detect obstacles using ultrasonic sensors.
- To trigger the buzzer for signaling.
- To make vibration alert to the person.
- To add Panic Mode Button which will be helpful for blind when in emergency or Danger.
- Panic Mode will share present location of user to guardian or parent.
- To add GPS-GSM Module which will detect location using GPS and send message using GSM.
- To simplify the physical movement of visually impaired person.

### [3] LITERATURE SURVEY

NAME OF REFERENCE PAPER	AUTHOR NAME	YEAR	PAPER CONCEPT	FUTURE SCOPE
Multi-Functional Blind Stick for Visually Impaired People	Vanitha Kunta Charitha Tuniki U. Sairam	2020,Fifth International Conference on Communication and Electronics Systems	Smart Blind Stick Using IOT, Obstacle detection, wet terrain detection, ,alert messages, finding misplaced stick.	It can be further enhanced by adding high performing sensors and using better material to make it light weight and flexible to use.

Smart Walking Stick	Srinidhi Srinivasan Rajesh M.	2019,Third International Conference on Trends in Electronics And Informatics	With help of Robot cane, all the real time movements can be taken into consideration.	This cane can be improved with feature that will detect fall of blind person.
Smart Stick for the blind & visually impaired people.	Mukesh Prasad Agrawal, Atma Ram Gupta	2018, International Conference on Inventive Communication and Computational Technologies	In this paper, Smart blind stick is built which will help the blind people to sense obstacles, water within the range & help to walk safely by using GPS-GSM module and RF module.	It can be upgraded by using faster microcontroller and high performing sensors.
Smart Walking Stick for visually impaired using image recognition with SIFT algorithm.	Muskan Gupta Mansha Kalra Guga Priya G.	2020,International Journal Of Scientific & Technology Research Volume 9	This Smart Stick uses SIFT algorithm, GPS module which benefits object detection and location update. It uses ultrasonic sensors, webcam, GPS and Ubidots cloud.	To decrease the lag of algorithm for reducing real time lag experienced by the user. Multiple ultrasonic sensors can be used to increase its efficiency.
Smart stick for blind people	Loganathan, K.Lakshmi, N.Chandrasekaran, S.R.Cibisakaravathi, R.Hari Priyanga, Harsha Varthini	2020,6 <sup>th</sup> International Conference on Advance Computing & Communication	Smart stick for blind people for obstacle detection, using ultrasonic sensors, radio frequency transmitter and receiver, controller, vibration	This idea can be improved further by adding additional sensors thereby increasing the utility factors of stick and its applications.

Table 1. LITERATURE SURVEY

**[4] BLOCK DIAGRAM**

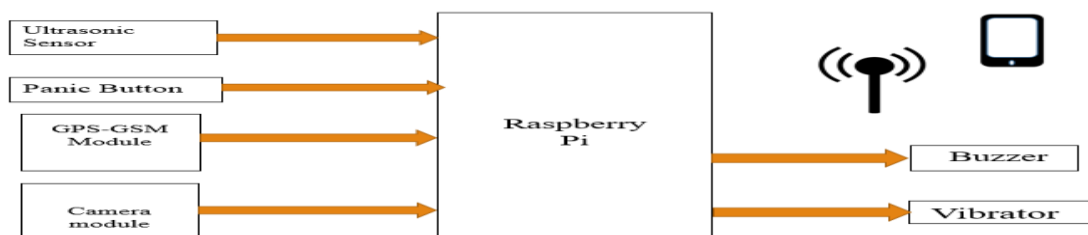


Fig 1. Block Diagram of Stick  
[5] FLOW CHART

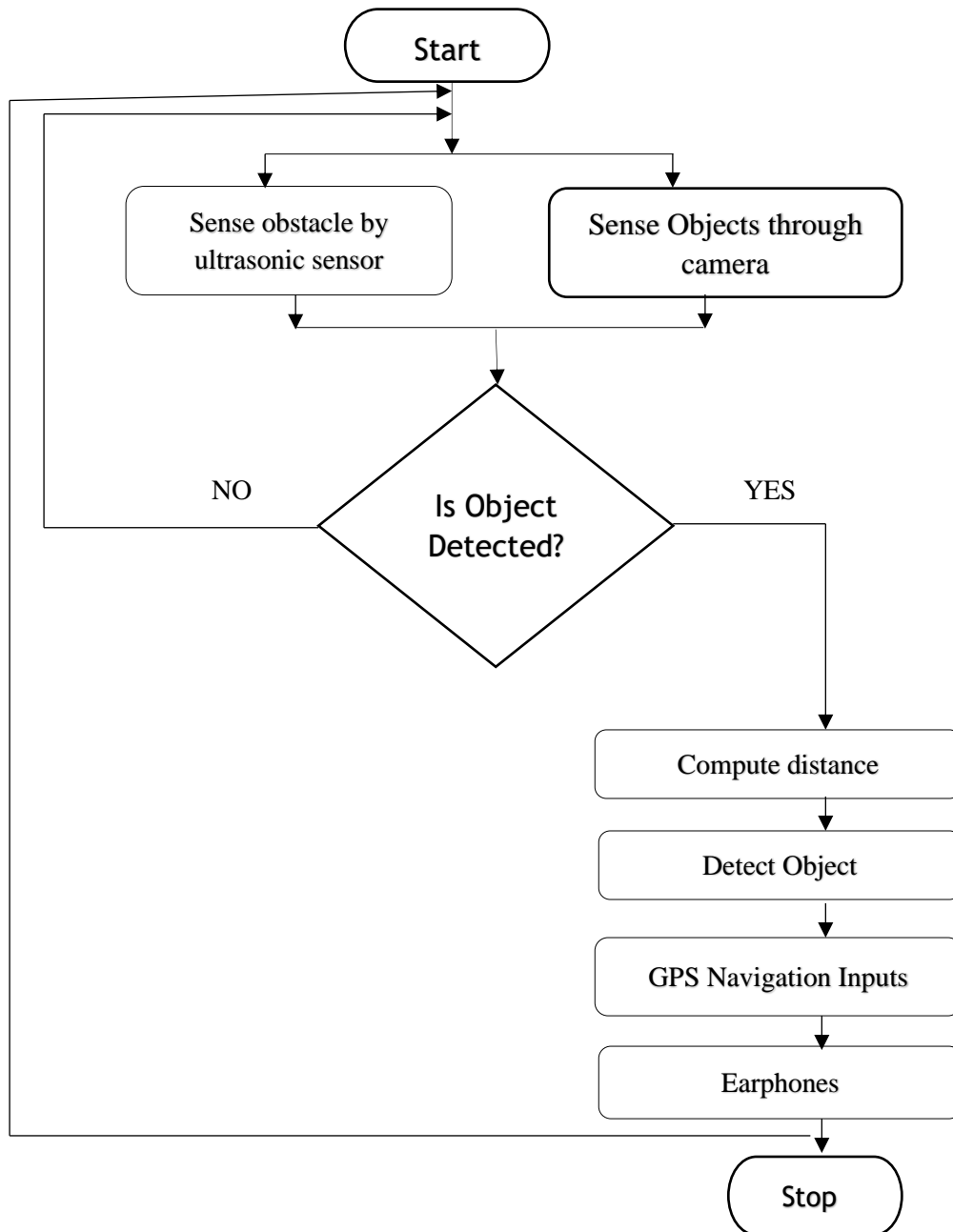


Fig 2. System Flowchart

## [6] RESULT

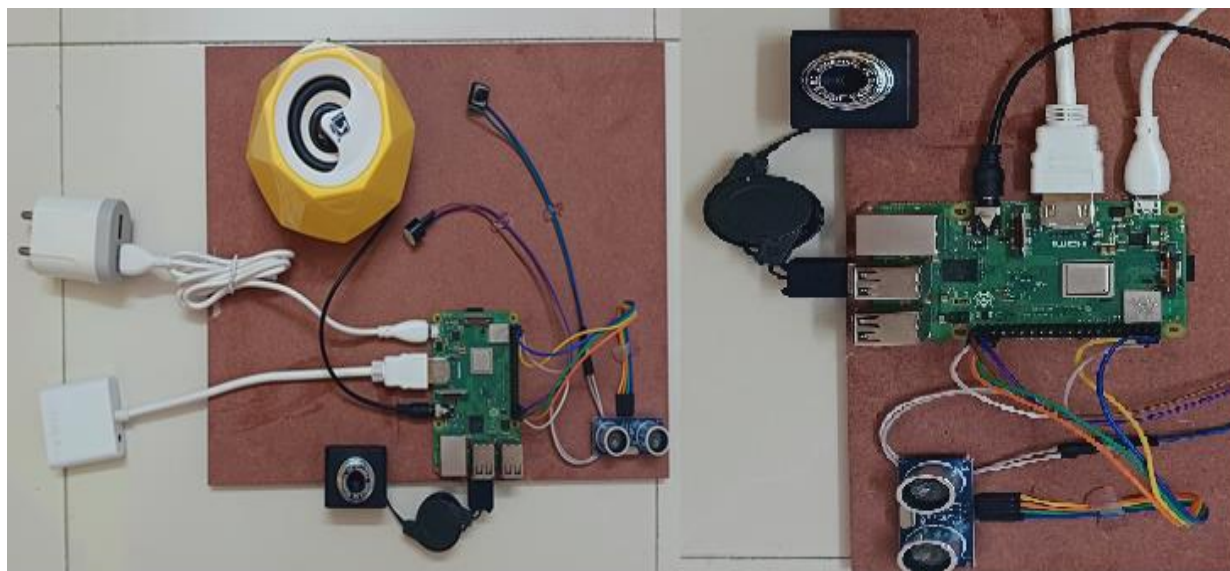


Fig 3. Images of project implementation

## [6] CONCLUSION

The project “smart stick for blind using raspberry pi” is designed to create a system using ultrasonic sensors, GPS module and providing voice command through headphone to the blind people. It would help a visually impaired person navigate through a public place independently. The proposed system tries to eliminate the faults 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. The design smart stick for blind using ultrasonic sensors and GPS with voice output is of great benefit to blind people when it comes to independent mobility. The advantage of the system lies in the fact that it can prove to be very low cost solution to millions of blind person worldwide. The proposed combination of ultrasonic sensor and GPS makes a real-time system that monitors position of the user and provides feedback making navigation more safe and secure. We are using espeak text to speech conversion to provide voice command as output. Blind person can easily navigate from one place to another as we are providing voice message. The prototype of smart stick for blind is able to detect obstacles in front of the user. And, it is therefore capable of guiding a visually impaired person for navigating his environment.

## [7] ACKNOWLEDGEMENT

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