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Survey on: Smart Blind Stick

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ABSTRACT- A smart blind stick is an effective help to visually impaired people with various features like objects and obstacles detection, alarm alert, navigation, self-defence features etc. In day to day life, visually impaired people face problems with walking through hallway, road. They always have a threat to their lives due to risk of fall. This survey paper contains comparative analysis of about the previously made blind stick considering features such as integrated with ultrasonic sensor along with IR and water sensor, GPS module etc.

KEYWORDS: object detection, water sensing, self-defence with stun gun, finding misplaced stick.

I. INTRODUCTION

Amongst all the living entities on the planet, humans are said to be the wiser, clever or intelligent species. They survive with the help of organs. But unfortunately some people are born disabled or lose body parts in an accident. Eg, during any events due to DJ's and laser lights are used which cause impact on organs and eventually becomes a permanent problem. A person with disabilities faces difficulties in performing any task and they have to depend on others. One of the disabilities is blindness. The blind people have a risk of their lives due to lack of vision. They face difficulty outdoors and are needed to be instructed all the time about the obstacles, moving objects, adverse conditions of the road etc.

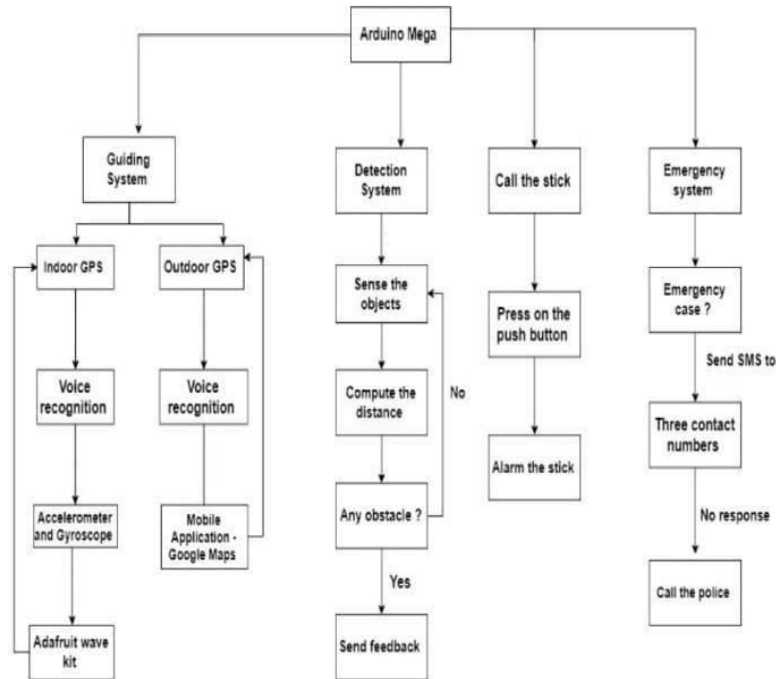
There are different sensors to detect the obstacles in way or water depth. Above survey highlights the difficulties of the blind people, for that purpose a Smart Blind Stick system is helpful.

II. LITURATURE SURVEY

Based on the survey we found out that some projects are making use of the GPS Module, panic button, moisture sensor etc.

2.1 Design and implementation of a vision stick with outdoor/ indoor guiding system and smart detection and emergency features.

The proposed stick is featured with indoor and outdoor guiding systems. The outdoor GPS is connected to Google maps which works as, the person specific a name of place it is sensed by a voice recognition module and sends back location to the developers mobile which provide the user with real-time information about the desired location, and the indoor guiding system uses an unlimited set of predefined locations of places the user usually visits.



Existing System 1 Design

The person specifies a place which is sensed by the voice recognising module and it communicates directly with the microcontroller and tell the stored location for the desired place. In the proposed stick 80 voice commands for 80 locations are present that represents the impaired person daily destinations.

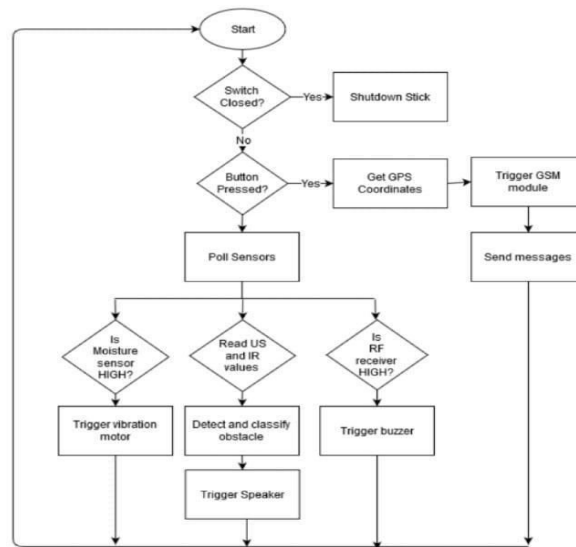
An important aspect of this work is the smart emergency system that protects the user from getting lost or hurt in all unusual conditions.

It includes a Microcontroller (Arduino Mega), a push-button, a GSM module and a GPS module. When the user presses the button it triggers the microcontroller which activates the GPS module to get the exact coordination of the user. It send a message to friend, family member mobile with the exact location of the blind person, in case of no response from friend or family it makes a call to police.

Another new feature of the proposed design, is the ability of the user to call the stick by a remote control in case it was lost or misplaced.

2.2 Multi-Functional Blind Stick for Visually Impaired People.

The proposed system can scan the surroundings obstacles and raise appropriate auditory and vibratory alerts. Two ultrasonic sensors are mounted on the stick, one closed to the bottom of the stick and the other mounted at 2/3rds of the length from the bottom end of the stick. This setup can detect obstacles of various shapes and sizes.



Existing System 2 Design

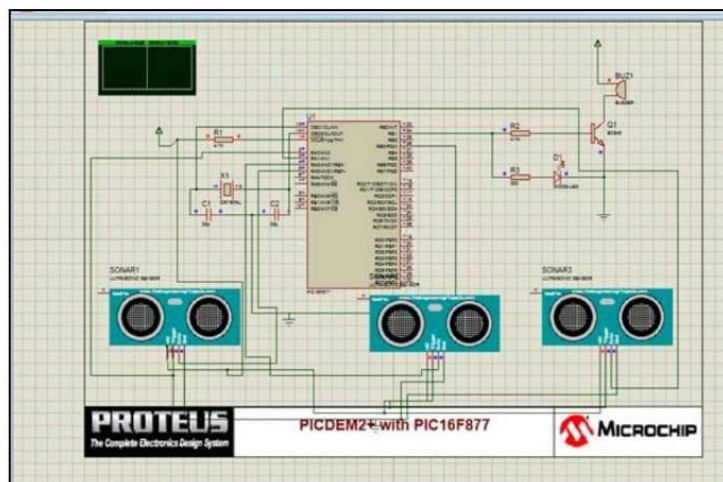
It can detect both damp and wet surfaces and can alert the user. The water or moisture sensor is gives a Boolean output after scanning the surface by which the algorithm raises a vibratory alert to the user using the vibration motor mounted at the top end of the stick.

Also, it is able to send the user’s location to their acquaintances via SMS in case of an emergency or distress. When button is pressed by the user the GPS module coordinates with the user. These coordinates are formatted as a Google maps link i.e “<http://maps.google.com/maps?q=loc:<latitude>,<longitude>>”.

Then the link is prepended with an appropriate message such as “I’m in danger please find me here” and this processed message is sent to the User’s caretakers using the GSM module.

It can be locatable when misplaced via a RF remote control. RF receiver and RF transmitter mounted on a simple remote controller. This remote controller also has a simple push button along with the RF transmitter, when its pressed it transmits a RF Signal via the RF transmitter on the remote, which can be detected by the RF receiver on the blind stick. The algorithm, after receiving the signal, buzzes a buzzer alert for a few seconds by directing the user to locate the stick.

2.3: Ultrasonic Sensor Based Smart Blind Stick.



Existing System 3 Design

In this paper design of a smart blind stick based on ultrasonic sensor implemented. Here three sensors are mounted to



detect object in left, right and front. After the detection of obstacle in the path of blind person the smart blind stick sounds a buzzer to make an alert. This system detects obstacle within the range of 5-35cm.

III. CAMPARATIVE ANALYSIS

System	Processor	Drawbacks	Cost
System 1	Arduino Mega	1. No self-defence tool for emergency. 2. Hard to install.	
System 2	Arduino UNO, microcontroller	1. Water detection not. provided 2. Stick is heavy.	
System 3	PIC microcontroller	1. Need of facility to find misplaced stick. 2. Less facilities provided	

IV. CONCLUSION

Based on the survey, we understand that the existing systems have some drawbacks and lack some facilities or features. As this system is not that popular in Asian countries, to increase the scope of the system it's important to make it user friendly. This will help the users and make the system effective.

V. ACKNOWLEDGMENT

It gives us great pleasures to present the survey report on Smart Blind Stick. We would like to thank our internal guide Miss. G.G. Desai and project coordinator Miss. R.M. Mulla for their effective help. WE are very grateful. We are also grateful to MR. R.P.Dhongadi, Head of Department, Sanjay Ghodawat Institute, Kolhapur for his Selfless support and suggestions.

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