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# Navigation Smart Stick for Blind

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**ABSTRACT** - The NAVIGATION SMART STICK FOR BLIND is a planned IoT technology which offers a viable way for blind or visually impaired people to travel and detect hazards safely. The Stick has a number of sensors, including ultrasonic, tilt and infrared fire sensors, as well as an audible voice command, a buzzer, and GSM to determine its location. Within a distance of one metre, the ultrasonic sensors can identify stairs, walls, and surrounding objects. The infrared fire sensor generates a warning buzzer tone to alert the blind person when it senses fire or any object. The suggested method makes use of the widely used and reasonably priced Arduino UNO board. Due to its low cost, quick response time, and less power usage, the stick is simple to use. IoT technology is used by this navigation smart stick to provide blind or visually impaired people with a safe and affordable way to navigate, identify impediments, and move around unrestrictedly without the assistance of a guardian.

## I. INTRODUCTION

The proposed NAVIGATION SMART STICK FOR BLIND or visually handicapped, the voice-activated blind stick combining an Arduino UNO and an ultrasonic sensor is a fantastic idea. With the aid of cutting-edge technology, this blind stick enables the user to hear spoken commands for warnings and identify obstacles using an ultrasonic sensor. Daily struggles for blind persons include those with mobility and communication. Due to their impairment, they frequently need the assistance of a sighted family member or friend when exploring new places. For the support of blind individuals, many devices have been created in the past. The voice-controlled blind stick that is being designed responds right away to situations. The Blind Stick with Voice Command, which gives visually impaired people the opportunity to move freely and safely about their environment, is an overall promising solution for enhancing their quality of life.



**II. LITERATURE SURVEY**

Year	PAPER NAME	PUBLISHER BY	FEATURES
2012	ULTRASONIC Spectacles and Waist-belt for Visually Impaired and Blind Person	Shripad S. Bhatlawande, Jayant Mukhopadhyay	It effectively calculates distance of the detected object from the subject. Prepares navigation path accordingly avoiding obstacles.
2014	A Blind Navigation System Using RFID for Indoor Environments	Sakmongkon Chumkamon	RFID blind navigation device that can be utilized by blind persons, tourists, and firefighters.
2018	Smart Stick for the Blind and Visually Impaired People	Mukesh Prasad Agrawal, Atma Ram Gupta	It can sense water in the path to avoid slipping or drenching. It can trace the location of the blind person and sends the data to their relatives.
2019	Smart Walking Stick for Blind integrated with SOS Navigation System	Saurav Mohapatra, Subham Rout	Provide a tool which will help blind people to navigate as well as sense the obstacles. a working model which is Walking Stick.
2020	An IoT based Voice Controlled Blind Stick to Guide Blind People	Md. Adil, Taiyaba Shadaka Rafa	The spoken warning message starts when an obstacle is detected.



2020	Blind Assistance System using Image Processing	P. Rama Devi, K.Sahaja, M. P. Tony Harsha	Enables blind victims to distinguish between different types of things in real time while receiving verbal feedback and distance.
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2022	Multi-Functional Blind Stick for Visually Impaired People	Vanitha Kunta, Charitha Tuniki	In an emergency, Stick can let the user's carers know where they are.
2022	Smartphone based Indoor Navigation System for the Blind	Aura Ganz, James M. Schafer	Use an Android smartphone with the accessibility - featured PERCEPT-II application.

### III. METHODOLOGY

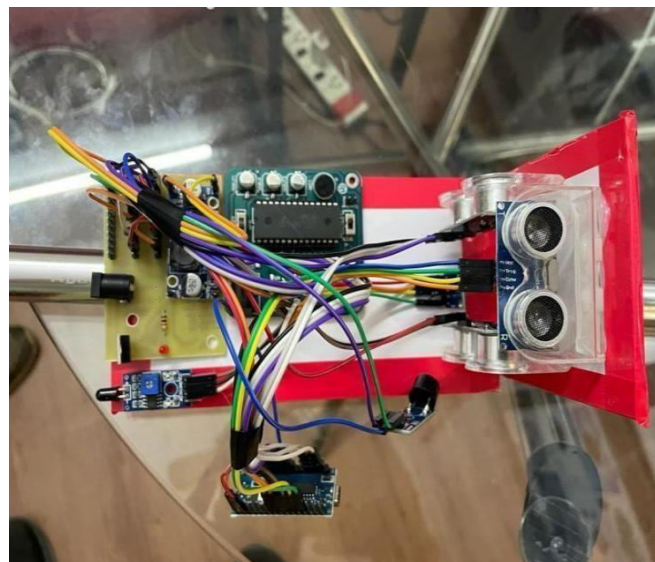


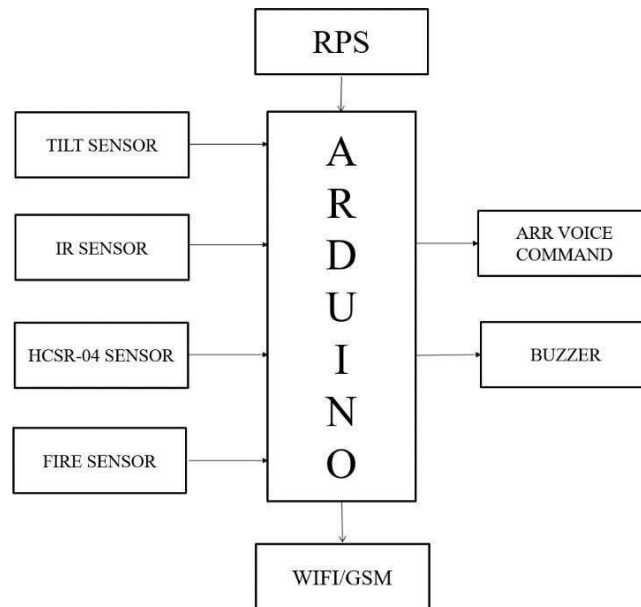
Fig:1 – Project System Design

Our project initially includes a stick and the sensors that are attached to it which a blind person carries inside the house with him when he needs to move. The proposed system consists of Ultrasonic sensors which use ultrasonic waves to find obstacles along with fire sensors which detect fire. While identifying obstacles like steps, fire, walls etc. The data from the sensor is sent to the Arduino UNO. After analysing the information, the Arduino UNO determines if the barriers are close enough.

Nothing will happen if the barriers are not close to the circuit. If the obstruction is within 1 metre, the Arduino UNO delivers a voice alert. If the user is in danger, the system contains a buzzer that is connected to GSM, and when it

comes into touch with the buzzer, it sends signals to the guardians device notifying them of the blind person's position as well as the fact that the blind person is experiencing some difficulty. With our proposed system the user can move easily around as the system is light weighted.

**BLOCK DIAGRAM:**



**Fig:2 - The proposed smart stick for blind system's operational flow diagram.**

**TOOLS USED:**

**Arduino uno:** Obstacle detection is one of the main concerns for a blind person, according to Arduino Uno. Here is a smart blind stick made with an Arduino Uno and ultrasonic sensors. This project's main objective is to help blind people walk more easily and to warn them when their path is blocked by other people or objects.

**Modul SIM8001:** The SIM8001 GSM module may be used along with Arduino as a recipient or sender of information that will be accessed by a smartphone. Despite having 16 pins, the SIM8001 module's components may work adequately without causing deterioration of the other components. If the indicator lights flash quickly, the SIM8001 has not yet received a GSM signal; however, if the lights flash, the SIM8001 has obtained a GSM information and its start to operate.

**IR sensor:** Is a light-emitting electrical gadget used to identify surrounding objects. A motion detector and an infrared sensor both sense an object's heat. Almost all items release some form of heat radiation in infrared spectrum. These forms of radiation are invisible to our sight, but an infrared sensor can detect them.

**HC-SR04 sensor:** Cheap and easy to use distance measuring sensor, 2 cm to 400 cm broad. The sensor





contains two ultrasonic transducers. The first is an ultrasonic sound pulse transmitter, while the second is an ultrasonic sound pulse receiver that looks for reflected waves.

**Tilt sensor:** Inclinometers, commonly referred to as tilt sensors, are tools used in a number of gravity-based applications to measure the slope, angle, or tilt of objects. Our inclinometer sensors come in a variety of configurations and packages to satisfy a range of customer measurement range, signal, and environmental conditions requirements.

#### IV. CONCLUSION

For object detection, the system makes use of reliable and effective ultrasonic sensors. At a distance of 1 m, the system can detect objects. The voltage used on this smart stick, which is powered by an Arduino 5V voltage, must be monitored by SIM800L modules. Less than the required voltage, the SIM800L will not be able to capture GSM signals. After pressing the emergency button, a message will be sent to the guardian in around 6 to 10 seconds notifying them of the blind person's whereabouts.

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