

Blind Stick For Blindly Disabled Individuals Using Android Smartphone's

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ABSTRACT: God given sense of vision to the individual is a vital part of our life. But there are some individuals who do not have the capacity of imagining things. The visually disabled need to confront numerous adjustments in there every day life. The issue deteriorates when they go to a new area. Just few of the navigation systems are accessible for visually disabled individuals which can give a dynamic route through voice output. None of these framework work exactly for both indoor and open air applications. In our proposed system, be propose a navigation device for visual impaired which is centred around giving voice over message for obstacles avoidance and guide them utilizing RFID innovation ,and android device .the proposed system is utilized for managing people who are partially sighted or blind. This proposed system is utilized to help visually disabled individuals without any injuries. The RFID tags are integrated into blind stick. The entire system is designed to be little and is utilized as a part of conjunction with the blind stick. This system is associated with an android smartphone through Bluetooth. An android application is designed which gives a voice message based on RFID tags.

KEYWORDS: Ultrasonic Sensor, RENESAS RL78 microcontroller, RFID, Bluetooth Module.

I. INTRODUCTION

Vision is one of the most important senses as most of the information human gets from the environment is through sight. WHO revealed that in October 2017, around 253 million individuals live with vision impairment. 36 million are blind and 217 million have moderate to severe vision impairment. 81% of people who are blind or have moderate severe vision impairment are aged 50 years and above.

Globally, chronic eye diseases are the main cause of vision loss. Comprehensively, uncorrected refractive mistakes are the fundamental cause of moderate and serious visual weakness, un-operated cataract is also a main cause of visual deficiency in middle and low-wage nations. According to global estimates work, the quantity of people visually impaired from infections has decreased in the last 25 years. Over 80% of all the vision impairment can be prevented or cured. There are number of visually disabled individuals in the society, who are suffering from vision impairment, which puts their lifeat risk while navigating from one place to another place. There is a need to give security and safety to blindly disabled individuals.

Even for the non-visually disabled the detection of obstacles is once in a while risky, it's surprisingly more dreadful for

the visually disabled individuals. Individuals with visually disabled are frequently subject to outside help which can be given by people, guide dogs or some of the electronic devices are used as aid for their navigation. Existing systems are used to detect the obstacles but they will prone to injuries and does not protect from obstacles at torso and face level. Therefore we were propelled to build a smart blind stick to beat these impediments.

II. RELATED WORK

Blind Aid Stick has been a popular project with constant enhancements and modifications. As of now the economically accessible of visually impaired stick are not that prominent because of high cost and absence of exactness. Past undertakings on a similar thought – Reference [1] Vision, a God skilled sense to individual is a vital part of life. With the assistance of our eyes, we can see the magnificence of nature, things which occur in everyday life. Be that as it may, there are some shocking individuals who do not have this capacity of encountering these things. They confront numerous issues in their day by day life. The issue deteriorates when they are in a new place. Subsequently to limit their troubles and that too without hardly lifting a finger, an idea has been thought of, which will direct Visually Impaired individuals to come to their destination(s). The Electronic Path Guidance will help them to move in a new place freely and with an indistinguishable effortlessness from they are in natural environment. For this the RF (Radio Frequency) correspondence is utilized.

Reference [2] the authors outlined and executed a microcontroller based portability help for visually impaired individuals. Their proposed stick comprises of unique discovery sensors incorporated to AT89C52 microcontroller for accepting, preparing and sending signs to the alert framework. The framework was planned, customized with low level computing construct and tried for exactness and checked by the outwardly hindered individual. The equipment utilized comprises of AT89C52 microcontroller, sensors (Ultrasonic, water, and light ward resistor, LDR), and alarm. Their mobility aid designed for blind people is affordable, reliable and easy to operate. The framework comprises of a ultrasonic sensor for deterrent location, a water sensor for water identification in dangerous regions and a light ward resistor for dull recognition. The cost viability of the proposed arrangement prompts bargains in execution. The proposed strategy is a minimal effort and light weight framework composed with a microcontroller that processes signals and alerts the blind individual over any obstacles, water or dark areas through beeping sounds. Their exploration work centers around obstacle detection, light identification and water recognition so as to diminish route troubles for visually impaired individuals.

Reference [3] proposed a multidimensional walking stick for visually impaired individual utilizing ultrasonic sensors connect with voice direction. The proposed technique actualized a system of ultrasonic sensors equipped for identifying the heading and position of obstacle(s). The execution and usefulness are enhanced by the expansion of ready light, and voice direction signal which is handed-off to a smaller than expected headset. Equipment utilized as a part of the execution of the framework are ISD 2590 voice record/playback chip, PIC16F887 microcontroller, ultrasonic sensors, voltage controller, and speakers (headset and amplifier). The recorded voice alerts the client of the nearness and heading of the obstacle(s). The model of the visually impaired help them to recognize obstacles in all the directions. The execution of his proposed stick in detecting obstacles is low, that is, 1 meter maximum range of detection. The model of the multidimensional walking stick help to identify obstacles inside the scope of 0m to 1m at the left, right and front of the stick with a voice alarm.

Reference [4] Independence is the building methodology in accomplishing dreams, objectives and targets throughout everyday life. Visually impaired people finds challenging to go out freely. There are a huge number of visually impaired or blind individuals in this world who are dependably needing assistance. For many years together the white cane was well-known navigation system for blind people and later endeavors have been made to enhance the stick by including remote sensor. Blind individuals have enormous issue when they stroll in the city or stairs utilizing white stick, however they have sharp haptic affectability. The electronic strolling stick will help the visually impaired individual by giving more advantageous methods forever. The main aim of this paper is to contribute our knowledge and services to the people of blind and disable society.

Visual impairment or visual hindrance is a condition that affects numerous individuals around the globe. The utilization of the visually impaired navigation system is less and is not proficient. The visually impaired person is reliant on other

guide like white stick, guidance given by their neighbours, trained dogs and so forth. Many visually impaired people use walking sticks or guide dogs to navigate. A guide dog is trained for an average of six months for guiding its users to avoid the accidents from objects and barriers over a fixed path or in a fixed area. At the point when a visually disabled individual uses a blind stick, he waves his stick and finds the obstacles by striking the obstacles in his way.

III. PROPOSED SYSTEM

The proposed design for electronic blind stick consists of

- 1) RENESAS RL78 Microcontroller
- 2) RFID AND RFID tags
- 3) Sensors
- 4) Bluetooth Module link with mobile

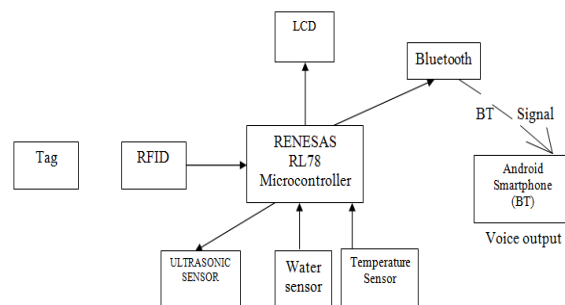


Fig 1: Block Diagram

"Electronic Stick and Android Smart telephones to the Aid of Blindly Disabled Individuals", goes for giving an appropriate route to people experiencing obscured vision and visual impairment, which occurs because of ageing factor. Numerous embedded frameworks have significantly unique outlines as indicated by their capacities and utilities. In this project design, structured design concept is adopted and the framework is predominantly made out of a Renesas microcontroller (RL78), LCD, Temperature sensor, RFID and RFID labels, Bluetooth module connect with mobile, Ultrasonic sensor, Water sensor.

The microcontroller situated at the center point of the block diagram frames the control unit of the whole project. Once the whole unit (including microcontroller and sensors) is worn by the visually impaired the sensors start to monitor the surrounding environmental conditions. The yield of the sensors is a voltage which compares to the surrounding environmental conditions. This voltage created by the sensors is fed to the inputs of the microcontroller. In this situation ultrasonic sensor contribution to the microcontroller. In view of the program inserted inside the controller a yield is produced and transmitted to the Android based Smartphone by means of Bluetooth module.

An application made and stored in the Android based Smartphone, creates speech yield depending upon the approaching messages transmitted by means of Bluetooth.

Ultrasonic sensor is used to find the separation of any object from the visually impaired. This can come close by for people with poor sight because of ageing factor. In the event that any object is situated inside the range of 20cm or 30cm, the sensor on recognizing the nearness of the obstruction conveys an input voltage to the microcontroller which at that point alarms the visually impaired by means of Android Smartphone using Bluetooth module.

In this project, LCD is also used in order to demonstrate the working of each unit.

1) RENESAS RL78 MICROCONTROLLER

RENESAS RL78 Microcontroller surpasses its predecessor that is 8051 group of microcontrollers, with different inbuilt highlights. Renesas microcontroller is a 16 bit microcontroller. Most of the pins of the Renesas have multitask highlights and its cost is nearly less. It is the control unit of the whole task. Once the whole unit (containing microcontroller and sensors) is held by the visually impaired individual, the sensors start to monitor the surrounding environment conditions. This voltage produced by the sensors is fed to the inputs of the microcontroller. Based upon the program embedded inside the controller a yield is created and transmitted to the Android based Smartphone by means of Bluetooth module.

2) RADIO FREQUENCY IDENTIFICATION (RFID)

Radio-frequency identification is an automatic identification technique, relying on storing and remotely retrieving data using devices called RFID tags or transponders. A RFID tag is an object that can be connected to or consolidated into an item, creature, or a man with the end goal of identification utilizing radio waves. Some tags can be read from several meters away and beyond the line of sight of reader.

A basic RFID system consists of an antenna, transceiver and an RF tag. The RFID system used in our project is of low-frequency about 125kHz and wireless distance ranging from 3-5cms.

Passive RFID tags are used in our project as they have no battery and broadcast their data only when energized by a reader. In our proposed system, RFID tags will be placed at different places and RFID reader is used to detect those places.

3) SENSORS

Ultrasonic sensor

Ultrasonic sensors measure distance by using ultrasonic waves. The obstacle detection is carried out using dual transducer ultrasonic sensor. The sensor head emits an ultrasonic wave and receives the wave reflected back from the target. Ultrasonic sensors measures the distance to the target by measuring the time between the emission and reception. Ultrasonic sensor provides a very easy method of distance measurement. This sensor is ideal for applications that expect you to perform estimations between moving or stationary items. This sensor on detecting the presence of obstacle delivers an input voltage to microcontroller which then alerts the blind individual via android smartphone through the use of Bluetooth module.

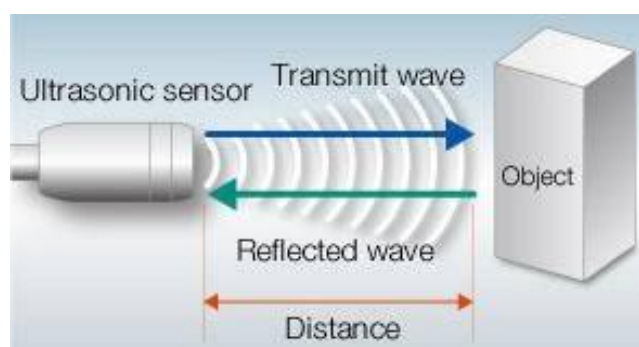


Fig 2: Emission of ultrasonic waves

Water sensor

Water level sensor is used to detect the presence of water in front of a blind or visually impaired person which helps

them to navigate easily without any injuries.

Temperature sensor

A Temperature sensor is used to measure the ambient temperature. LM35 is a linear temperature sensor used in our project. This particular temperature sensor has three pins- a positive, a ground, and a signal. It is used to detect the unexpected temperature like fire or smoke in the surroundings of a vision impaired person.

4) BLUETOOTH MODULE LINK WITH MOBILE

Bluetooth module is designed for transparent wireless serial connection setup. Its communication is via serial communication which makes an easy way to interface with controller. Based upon the program embedded within the controller an output is generated and transmitted to the android based smartphone via Bluetooth module.

IV. EXPERIMENTAL RESULTS

The below fig: 1 displays the Obstacle Detected message



Fig 3: Obstacle Detected.

V. CONCLUSION

This paper subsequently introduces the framework plan and idea of a brilliant and simple to utilize Blind Aid Stick for the visionless. The key highlights are the basic outline, productive yet simple to utilize and change architecture and framework outline. Henceforth it can give a minimal effort device to many visually impaired individuals in the whole world. The proposed framework joins different existing effectively innovations and ongoing framework sensors that assistance in easy navigation. The task can additionally be adjusted to expand ranges for obstacles and as the GPS innovation keeps on developing the exactness will progress. The Advancement in Mobile innovation will additionally help in growing better applications for consistent appraisal of environment. Innovation of Wi-Fi and can likewise be incorporate alongside IOT with the goal that highlights like Whether and traffic production can enable the blind to further evaluate better.

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