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Smart Stick for Blind People

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Abstract: ***As we know that sense of vision to human being is an important thing in our life, but there is some people who have lack of mobility because of blindness The objective of this project is used to help the blind people and they are able to easily interact with the physical world by using this smart blind stick. About 285 million people are visually impaired worldwide: 39 million are blind and 246 million have low vision. If you notice them , you can very well know about it they can't walk without the help of other. One has to ask guidance to reach their destination. Using this blind stick , a person can walk more confidently. This stick with ultrasonic sensor detects the object in front of the person and give response to the user by alarm from the buzzer, which will give a high buzz as the object gets closer to the blind person. So, the person can walk without any fear. The LDR sensor are used in the stick to identify the day and night for the blind people. The microcontroller (Arduino Nano) to receive the sensor signals and process them to short pulses to the Arduino pins where buzzers are connected. This device will be best solution to overcome their difficulties and help***

Keywords:- Smart Stick, Arduino Uno, Location Tracking, Sensors, Object Detection

I. INTRODUCTION

Technology can help disabled persons to live a normal life. Humans are not disabled. A person can never be broken. Our built environment, our technologies, is broken and through technological Innovation. With this in mind here we use the power of **Arduino and simple sensors to build a "Blind man's stick"** that could perform more than just a stick for visually impaired persons.

II. LITERATURE SURVEY

A. S.Ganwar(2011)

Designed a smart stick for blind which can give early warning of an obstacle using Infrared (IR) sensors[8]. After identifying the obstacles, the stick alerts the visually impaired people using vibration signals. However the smart stick focused only for obstacle detection but it is not assisting for emergency purposes.

B. S.Chew (2012)

Proposed the smart white cane, called Blindspot that combines GPS technology, social networking and ultrasonic sensors to help visually impaired people to navigate public spaces.The GPS detects the location of the obstacle and alerts the blind to avoid them hitting the obstacle using ultra-sonic sensors. But GPS did not show the efficiency in tracing the location of the obstacles since ultra-sonic tells the distance of the obstacle [9]

C. Benjamin etal (2011)

Had developed a smart stick using laser sensors to detect the obstacles and down curbs [10]. Obstacle
detection was signalized by a high pitch "BEEP" using a microphone. The design of the laser cane is very simple and intuitive. The stick can only detects obstacle, but can not provide cognitive and psychological support. There exists only beep sound that triggers any obstacle and there is no any assistance to direct them.

D. Central Michigan University (2009)

Developed an electronic cane for blind people that would provide contextual informationon the environment around the user. They used RFID chips which are implanted into street signs, store fronts, similar locations, and the cane reads those and feeds the information back to the user [11].
The device also features an ultrasound sensor to help todetect objects ahead of the cane tip.The Smart Cane, which has an ultrasonic sensor mounted on it, is paired with a messengerstylebag that is worn across the shoulder.A speaker located on the bag strap voice alerts when an obstacle is detected and alsodirects the user to move in different direction.

E. Mohd Helmyabd Wahab and Amirul A. Talibetal (2011)

Developed a cane could communicate with users through voice alert and vibration signal) [12]. Ultrasonic sensors are used to detect obstacle in front, since ultrasonic sensors are good in detectingobstacle in few meters range and this information will be sent in the form of voice signal. This voice signal is send via speaker to the user. Here blind people might find it difficult in travelling without any emergency alert rather than having only ultrasonic sensors.

F. Alejandro R. Garcia Ramirez and Renato Fonseca Livramento da Silvaetal (2012)

Designed an assistive technology devicecalled the electronic long cane to serve as a mobility aid for blind and visually impaired people [13].The author implements thecane with an ergonomic design and an embedded electronic system, which fits inside the handle of a traditional long cane. The system was designed using haptic sensors to detect obstacles above the waistline. It works in such a way when an obstacle isdetected; the cane vibrates or makes a sound. However this system only detects obstacle above the waistline.

G. Joao José, Miguel Farrajota, Joao M.F. Rodrigues (2011)

Designed a smart stick prototype. It was small in size, cheap and easily wearable navigation aid. This blind stick functions by addressing the global navigation for guiding the user to some destinyand local navigation for negotiating paths, sidewalks and corridors, even with avoidance of static as well as moving obstacles. Rather than that, they invented a stereo camera worn at chest height, a portable computer in a shoulder-strapped pouch orpocket and only one earphone or small speaker. The system is inconspicuous, and with no hindrance while walking with the cane.Also it does not block normal sound in the surroundings.Shruti Dambhare and A.Sakhare (2011) designed an artificial vision and object detection withreal-time assistance via GPStoprovide a low cost and efficient navigation aid for blind which gives a sense of artificial vision by providing information about theenvironmental scenario of static and dynamic objects around them .

III. PROCEDURE FOLLOWED IN THE PROPOSED SYSTEM

A. Recognizer Module

This module is basically responsible for recognizing the obstacles coming in the way of the person and make a vibration in the physical stick to notify the user that he is about to face an object.

B. GPS and GSM Module

In this module through GPS and GSM the longitude and latitude of the stick is tracked which is sent to the emergency contact in emergency situations. The latitude and longitude of the stick is sent as a text message.

GPS device will retrieve from the GPS system location and time info altogether atmospheric condition, any place on or close to the planet. A GPS reception needs Associate in Nursing patent line of sight to four or additional GPS satellites, [2] and is subject to poor satellite signal conditions. In exceptionally poor signal conditions, as an example in urban areas, satellite signals could exhibit multipath propagation wherever signals skip off structures, or area unit weakened by environmental condition. Clogged lines of sight could arise from a tree cover or within a structure, like in an exceedingly building, garage or tunnel. Today, most standalone GPS receivers area unit employed in cars. The GPS capability of smartphones could use aided GPS (A-GPS) technology, particularly once GPS signals area unit poor or unavailable. However, the mobile network a part of the A-GPS technology would not be accessible once the smartphone is outside vary of the mobile reception network.

Global System for Mobile Communications (GSM) services area unit a typical assortment of applications and options accessible to transportable subscribers everywhere the planet. The GSM standards area unit outlined by the 3GPP collaboration and enforced in hardware and code by instrumentation makers and transportable operators. The common place makes it doable to use constant phones with very different companies and services, or perhaps stray into very different countries. GSM is that the world's most dominant transportable commonplace.

IV. METHODOLOGY

A. Arduino UNO

This is an open source tool which is easily available. The advantage of using it is easy to implement because it uses oject oriented programming pagadigm for the implementation of the code. It contains 14 digits pins and 6 analogue pins which is used for input and output data. Our project uses the analogue pins for input IR proximity sensor and the digital pins for output.

B. Ultrasonic Sensors

Ultrasonic sensor also called as an ultrasonic transducer.We are using inaudible sensors which are very depandable for the outstanding skills. Inaudible sensors work out the major complicated tasks involving object detection or level activity with millimetre exactness,as a result of their activity technique works dependably underneath most conditions. Ultrasonic sensors measures accurate distance using non-contact technology-A technology that involves no physical contact between sensors and object. Transmitter and receiver are two main parts of the sensor where former converts an electrical signal to ultrasonic waves while later converts that ultrasonic signals back to electrical signals . These ultrasonic waves are nothing but sound signals that can be measured and displayed at the receiving end.

Ultrasonic sensors have tried their dependableness and endurance in nearly all industrial sectors. These sectors include:

- Mechanical engineering/machine tool
- Food and drink
- Woodworking and furnishings
- Building materials
- Agriculture
- Construction
- Pulp and paper
- Material handling
- Level activity

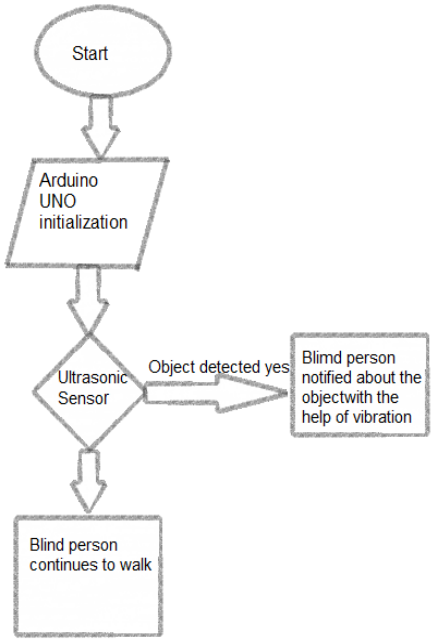

Fig1 : Flowchart for object detection

V. RESULT

A. If no obstacles found, person can move.

B. If obstacles or dip in path detected buzzer and speaker will sound loud.

VI. CONCLUSION

In this project we emphasize in making of a STICK FOR HELPING THE BLIND PERSON and which we expect will help the sightless person to sense the objects on its way and will also help him to understand whether its day or night .This stick will guide the some to a safe path. On the other side we are still implementing some modifications regarding to our project in which a blind person will be guided to the path he wants to go and will provide the information if he has to go left or right with a bluetooth headphone programmed to provide information and instructions and many other sensors to make it more useful.

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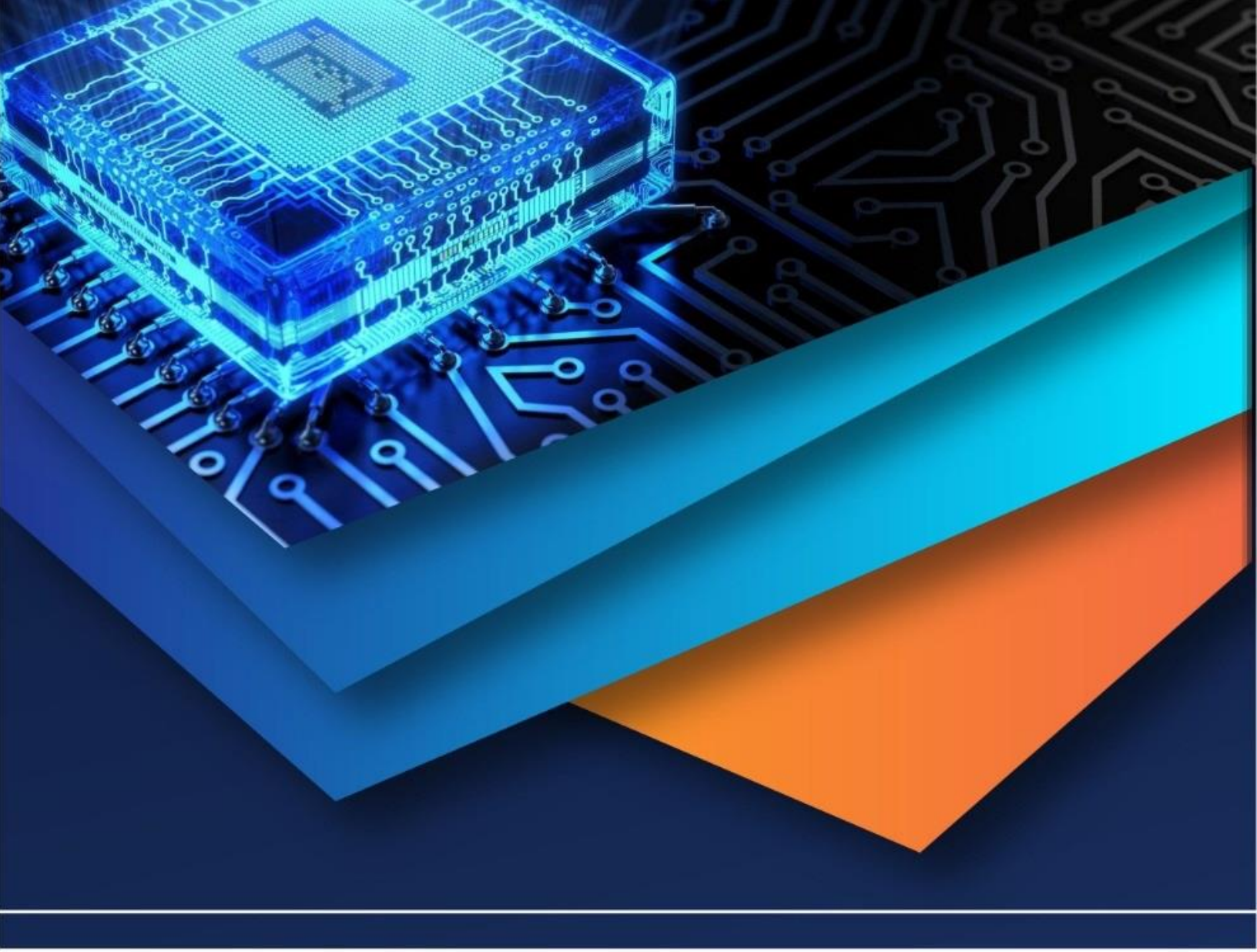

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