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Easy Navigation for Blind Person Using Smart Stick Based On GSM

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ABSTRACT: Independence is the building methodology in achieving dreams, goalsand objectives in life. Visually impaired persons find themselves challenging to go out independently. In our lifes we cross across millions of blind people who are in need of help . In this project,we are implementing smart way blind stick for those people to make their life easier.

KEYWORDS: ArduinoUNO, WaterSensor, GPS Module, GSMModule, Ultrasonic Sensor

I INTRODUCTION

Vision is the most significant a part of human physiology as 83% of knowledge person gets from the surroundings is via sight. The count of visually impaired individuals rises each year. The 2011 statistics by the World   Health   Organization (WHO) estimates that there square measure 285 billion individuals in world with visual defect, thirty-nine billion of that number are blind and 246 with low vision. In existence they bear drawback of navigation to go from one place to a different safely and timely. They usually rely on external help which may be provided by humans, trained dogs, or special electronic devices as support systems for deciding. The foremost necessary drawbacks of those aids consists of necessary skills and coaching part, range of motion and extremely very little information sent. With the fast advances of contemporary technology, each in hardware and software package front have brought potential to produce intelligent navigation capabilities. Technique presents an inspiration to produce a wise electronic aid for blind individuals, each publicly and personally. In this it is used as artificial vision and also be a real time helper trough global positioning system .There is a major role of embedded system. We are implementing ultrasonic sensor, GPS receiver, GSM module, accelerometer, microcontrollers and speaker. Smart walking stick is specially designed to find obstacles which can facilitate the blind to navigate freely. The audio messages keeps the user alert and significantly scale down accidents. A voice enabled automatic switch is additionally incorporated to assist them in house also. This blind guidance device use ultrasound attributable to its immunity to the environmental noise.Another excuse why ultrasonic is standard is that the technology is comparatively cheap, and sufficiently little to be carried without the requirement for complicated circuit.

II.PROPOSED SYSTEM

Individuals go along with the help of sensory organs with the assistance of encompassing condition. The structures of neurons of eyes, ears, nose, tongue, skin into a major completeness joins with the human neural structure. regarding eightieth of the info from the planet is nonverbal that we have a tendency to might get a handle on or translate, the eyes best defend U.S.A. from risk.It might occur within the event that you simply lose your visual perception!! the foremost imperative feeling of all is being vision, the remainder of the colleges like bit, taste, and smell area unit foursquare or in a very detour dependent on that. The eyes in relationship with the mind, even before it's been contacted unravel the shading consequently assessing the temperature of a writing,. thus externally weakened people and currently and once more, people because the vision takes a worsening with increasing age is skillful, cannot keep from a little of the hazards that we have a tendency to check during this eccentric condition that encompasses U.S.A. a stick is employed to direct over their manner or take the guide of pet creatures.

2.1 PROPOSED SYSTEM

The planned image as shown in Figure three.1 is Associate in Nursing device that constitutes of obstacle detection module, a fall detection module, hazard detection module, navigation module combined with GPS and IOT, alert system at the side of distress button and also the main processor used here is powered by Associate in Nursing external battery
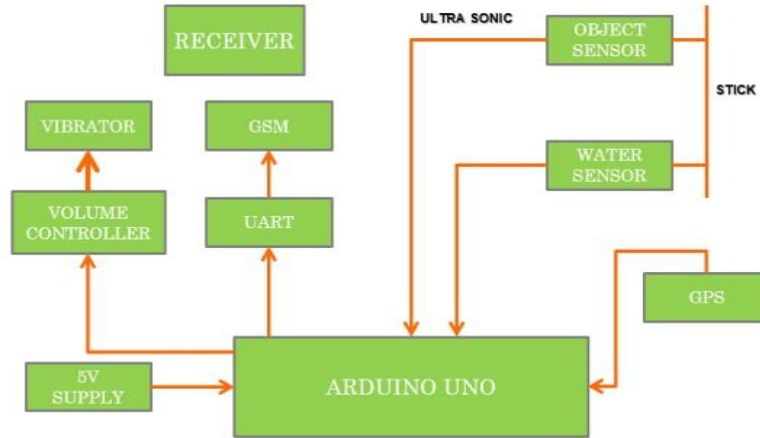

Fig.No.2.1 Block diagram

This myArduino Uno is the hardware which can execute the instructions that we design in the LabVIEW which is the software which acts as the interface between hardware components and Arduino Uno. All the mentioned components are combined and mounted on to a walking stick.The project additionally incorporates IoT technology to interconnect the autumn detection, obstacle detection, and hazard detection modules with the net and therefore report any instances of a fall and/or abnormal conditions that the holder might need to face to the family member(s) of the vulnerable person via Email through LabVIEW code. A special distress button are going to be utilized by the vulnerable person in an exceedingly scenario wherever they are available face to face with dangers unexpectedly, to attach with the family straightaway.

2.2 OBSTACLE-DETECTIONMODULE

The operation of this module is to sight the presence of any obstacles within the walking path of the holder, these obstacles is also stationary objects or living beings. This Module consists of 2 devices (i) inaudible sensor (ii) Water device inaudible transmitter releases associate degree inaudible wave in a very direction, and it starts the timer directly once the wave is launched, this wave travels within the air, and also the wave returns promptly once it adheres with any obstacles on its itinerary. The inaudible receiver would stop the timer fleetly when the mirrored wave returns from its journey. As inaudible unfold speed is 340m/s within the air, supported the timer record t, we will calculate the gap (s) between the obstacle within the path and transmitter, namely

s = 340t/ a

pair of that is additionally known as because the time distinction distance measure principle, live the timefrom launch to reflection once it encountered the obstacle, then calculate the gap between the transmitter and also the obstacle in line with the time and also the speed. Distance measure formula is expressed as

L= C*T

within the formula, L is that the measured distance, and C is that the inaudible spreading speed within the air conjointly T represents time (T is [*fr1] the continuance from sending to receiving).
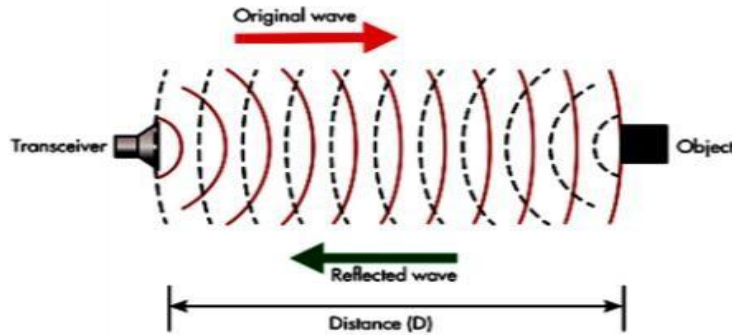
Figure 2.2 Working of Ultrasonic Sensor

2.2.1 WATER SENSOR

Water sensors detect the presence of water and, when placed in locations where water should not be present, a leak. When Wi-Fi is enabled, the sensor can send out a notification to the homeowner through a smartphone app.

Figure 2.3 Water Sensor

2.2.2 NAVIGATION MODULE

GPS receivers use a constellation of satellites and ground stations to work out position and time nearly anyplace on earth. At any given time, there area unit a minimum of twenty four active satellites orbiting over twelve,000 miles higher than the planet. The positions of the satellites area unit created in a very

Figure 2.4 Working of GPS Module

method that the sky higher than your location can forever contain at the most twelve satellites. The first purpose of the twelve visible satellites is to transmit info back to earth over frequency (ranging from 1 to 1.5 GHz). With this info and a few maths, a ground-based receiver or GPS module will calculate its position and time. The information sent right down to earth from every satellite contains a couple of completely different items of knowledge that enable your GPS receiver to accurately calculate its position and time. a very important piece of kit on every GPS satellite is a particularly correct

timepiece. The time on the timepiece is shipped right down to earth together with the satellite's orbital position and arrival times at completely different points within the sky. In different words, the GPS module receives a timestamp from every of the visible satellites, together with knowledge on wherever within the sky all is found (among different items of data). From this info, the GPS receiver currently is aware of the gap to every satellite seeable. If the GPS receiver's antenna will see a minimum of four satellites, it will accurately calculate its position and time.This can be conjointly referred to as a lock or a fix. It's conjointly called the driving circuit that is employed offer|toprovide|to produce} power to the opposite physical science devices connected to that counting on the kind and demand the facility supply circuits vary.

III   HADWARE IMPLEMENTATION

3.1 HARDWARE REQUIREMENTS AND INTERNETWORKING

The equipment that we've picked isArduinouno, that have 3 ports especially A, B and C which may send and acquire signals from sensors and hardware needed. Forty advanced I/O lines usually speaking with facilitate for various conventions like SPI, PWM out, construction encoder input, UART(Tx and Rx), and I2C straightforwardr|for less complicated|for easier} correspondence with sensors; eight singlefinished easy data sources; 2 differential easy knowledge sources; four single-finished easy yields; and 2 ground-referenced simple yields take into thought availableness to endless sensors and gadgets and automatic management of frameworks. the bulk of this quality is implicit and preconfigured within the default FPGA quality, that kills the necessity for extension sheets or "shields" to incorporate utility. At last, these highlights modify understudies to try and do true coming up with immediately from radiocontrolling vehicles to creating stay solitary restorativegadgets. thus this sensible stick would likewise progress toward changing into freelance and free. The sensing element modules that are elite out area unit. The sensing element modules that are elite out are:

1)   Ultrasound sensing element.

2)   Water sensing element

3)   3-axis measuring system constitutional in Arduino Uno Arduino UNO has the microcontroller ATmega328 embedded in it. It has 14 digital I/O pins out of which 6 provide PWR output. It is an open-source and provides prototype platform. It also has a 16MHX crystal oscillator attached to it. In addition to the above features, it also has an USB connection, a power jack, an ICSP, header and reset button.

3.1.1 ARDUINO UNO

Arduino UNO has the microcontroller ATmega328 embedded in it. it's fourteen digital I/O pins out of that six offer pressurized water reactor output. it's associate degree ASCII text file and provides example platform. It additionally encompasses a 16MHX oscillator hooked up to that. additionally to the higher than options, it additionally has associate degree USB association, an influence jack, an ICSP, header and push.

Fig.No. 3.1 Arduino UNO Circuit Board

It has everything to support a micro-controller. It will merely be connected to a pc exploitation associate USB cable or power it with associate AC or a DC adapter or a battery.

3.1.2 GSM MODEM SIM 900

It is widely used in mobile communication. The converter which has been used in this is RS232 level converter. It has the ability to send SMS through SMS cell broadcast method. Having a information measure of 9600 – 115200 rate it will send or receive SMS at a really fast pace. It conjointly encompasses a low power consumption that may be a major advantage.

Figure 3.2 SIM 900 GPRS/GSM Module

IV METHODOLOGY

4.1 OBSTACLE DETECTION
• Both the supersonic sensors area unit in standby mode.

• Sensors area unit in active mode.

• If any immoveable object is gift inside the vary of 0.5 meter, then the supersonic detector detects it and sends this to the Arduino Uno ,which then instructs the buzzer to warn the user.
• If any living being is found within the vary of 3 to seven meters (adjustable) and in a hundred and twenty degrees angle then it detects their heat signatures and transmits an equivalent info to Arduino Uno, that instructs the buzzer to warn the user.

4.2 FALL DETECTION
•   The operation is done with the help of inbuilt accelerometer.
•   If the threshold value is lss than the orientation of the accelerometer value then the result is assumed to fall.
•   When the user falls the contact which has been listed in the module gets a alert regarding the fall of the user

V. RESULT

VI. CONCLUSION

We practically designed a prototype of an electronic system that helps an assailable/unsafe person to be connected with alert his/her family in times of danger. While most appliances marketed as smart walking stick incorporate only GPS connectivity with some basic features, our project envelopes fall detection, hazard detection, obstacle detection and combine these with the Internet of Things to give a practical solution that puts the technology in service to those in need. In the future, this project can be extended by interfacing a camera to the wall the live video feed of the camera is processed unendingly victimisation numerous digital image process techniques and by connecting it to a cloud, the

environment of the person is calculable and directions is given in step with it.Whereas this needs High Definition camera, continuous property to high-speed web, complicated processing techniques, high-speed processor and a cloud server during a remote location.
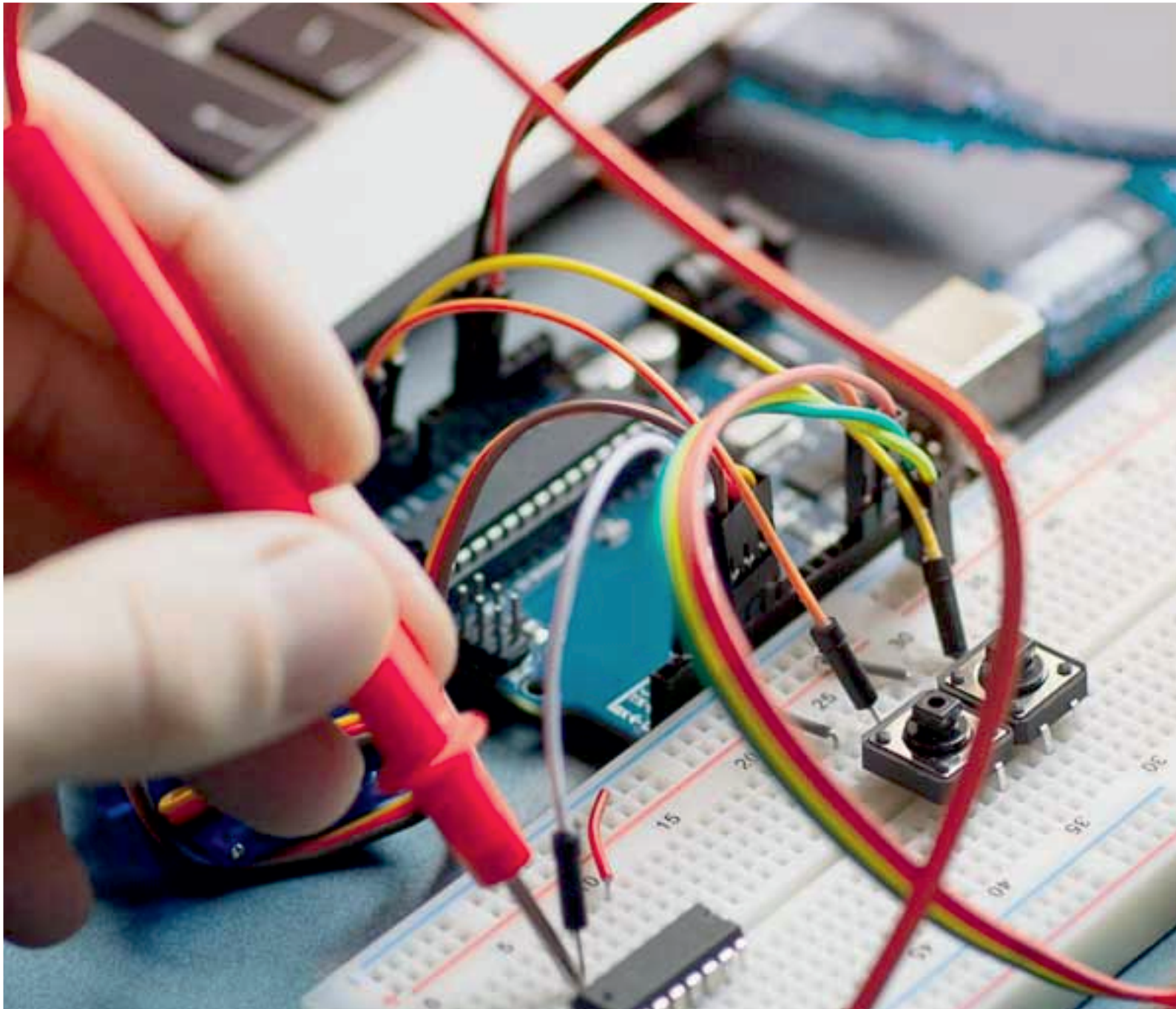
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