

Assistive Voice Alert Based Smart Stick for Blind People with GPS

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Abstract: Overall in excess of 160 million individuals are outwardly impaired with 37 million to be blind. The need to for assistive devices was and will be consistent. There is an extensive variety of route frameworks and instruments existing for outwardly impaired people. The paper principle objective is to give a chatty help to blind individuals. We will build up a savvy framework that works productively great in both indoor and open air. Current route device for the outwardly impaired spotlight on heading out starting with one area then onto the next. This spotlights on planning a device for outwardly impaired individuals that assistance them to voyaging autonomously likewise it must be agreeable to utilize. The proposed device is utilized for controlling people who are blind or incompletely located. The device is utilized to help blind individuals to move without any difficulty and certainty as a located people. In addition, it gives the voice caution to keep away from obstructions in view of ultrasonic sensors and abstains from slipping into water utilizing dampness sensor. This can even cozy the blind individual about the present condition outside whether it's light or dull utilizing LDR. The nonstop following of the client is conceivable utilizing this. The entire device is intended to be little and is utilized as a part of conjunction with the white cane.

Keywords: GPS, LDR, GPRS, MCU.

I. INTRODUCTION

Blindness or visual debilitation is a condition that influences numerous individuals around the globe. This condition prompts the loss of the profitable feeling of vision. The blind individual really necessities and recognizing objects. The blind navigation system providing food needs of the blind individuals who are not ready to move from one place to other place without the assistance of others. Late overview source India is currently turned into the world's huge number of blind individuals. The use of the blind navigation system is less and not productively utilized for strolling sticks and guide canines to move from place to put. For this gathering of populace; the objective is regularly to finish assignments at all obstructive technique. A guide puppy is prepared to direct its clients to maintain a strategic distance from the mishaps from items and obstructions. At the point when an outwardly impaired

individual is utilizing a mobile stick, they waving their strolling stick and finds the snag by striking obstacles in front of them.

II. LITERATURE SURVEY

Blind and outwardly impaired individuals are off guard when they travel since they don't get enough data about their area and introduction concerning movement and obstacles in transit and things that can undoubtedly be seen by individuals without visual inabilities. The regular methods for direct pooch and long cane just help to maintain a strategic distance from obstacles, not to comprehend what they are. Navigation systems more often than not comprise of three sections to enable individuals to movement with a more noteworthy level of mental solace and autonomy. Detecting the quick condition for obstacles and perils, giving data about area and introduction amid movement. Today in the market distinctive advances like GPS, GPRS, and so forth are utilized to explore outwardly impaired individuals. The investigations of different distributed universal papers have been finished. Before more mechanically propelled answers for versatility helps are examined it is valuable to layout essential properties of the customarily utilized essential guides and clarify their principle properties and restrictions.

White Cane: The most popular mobility hand held aid. It is usually foldable and adjustable to the height of the user. A blind person using swing-like movements, "scan" the path in front in approx.

Guidance of Dog: A specially trained dog assisting the blind in obstacle avoidance, but usually not aiding in way finding (unless travelling a familiar path), e.g. the dog is trained to stop before obstacles, reacts to commands on walking directions.

III. PROPOSED SYSTEM

The proposed navigation system in this paper for the most part centers around:

- Sensing of the quick encompassing condition against obstacles utilizing ultrasonic sensor with a separation scope of 20 cm.
- Warning about the obstacles utilizing voice playback module with the voice summon as "obstacle alter course".

- It has a LDR that can detect the light conditions and give the relating yield as a voice summon when it recognizes the dim as "it's getting dim".
- Using the soil moisture sensor it can detect the water in front of the client and the ringer sound will be capable of being heard to the client ,which is an indication of water pit ahead, when the water level is more than the limit.
- We can even track the area of the client utilizing GPS API scratch and the area of the client will be insinuated to the guardian utilizing the area outline Blynk application in overseer portable.

IV. PROPOSED SYSTEM

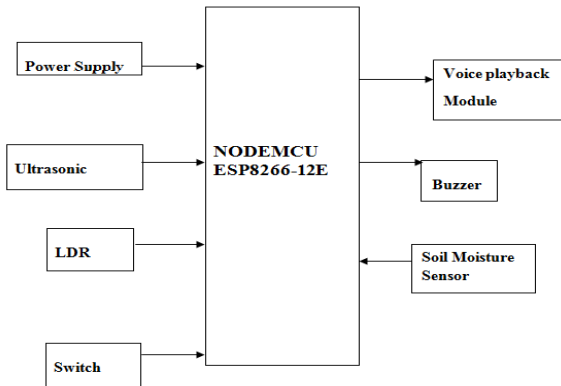


Fig.1. Proposed System Block Diagram.

A. Nodemcu ESP8266_12E

The Node MCU is an open-source firmware and advancement unit that causes you to Prototype your IOT item inside a couple of Lua content lines as shown in Fig.2. It incorporates firmware which keeps running on the ESP8266 Wi-Fi SOC from Espress if Systems, and equipment which depends on the ESP-12 module.



Fig. 2. Node MCU board.

Propelled API for equipment IO, which can significantly lessen the repetitive work for designing and controlling equipment. Code like arduino, yet intuitively in Lua content. Occasion driven API for organize applications, which encourages designers composing code running on a 5mm*5mm,, measured MCU in Node.js style. Significantly accelerate your IOT application creating process. ESP-12E Wi-Fi module is created by Ai-scholar Team. center processor

ESP8266 in littler sizes of the module typifies Tensilica L106 coordinates industry-driving ultra low power 32-bit MCU smaller scale, with the 16-bit short mode, Clock speed bolster 80 MHz, 160 MHz, underpins the RTOS, incorporated Wi-Fi MAC/BB/RF/PA/LNA, on-load up radio wire. The module underpins standard IEEE802.11 b/g/n assention, finish TCP/IP convention stack. Clients can utilize the add modules to a current device systems administration, or building a different system controller. ESP8266 is high joining remote SOCs, intended for space and power compelled versatile stage fashioners. It gives magnificent capacity to insert Wi-Fi abilities inside different systems, or to work as an independent application, with the most reduced cost, and insignificant space necessity.

B. Ultrasonic Sensor

The ultrasonic sensor is a transducer which changes over electrical vitality into sound waves and the other way around. These sound waves fall over the ordinary scope of human hearing and thus it is known as ultrasonic waves. These sort of waves are over the recurrence of around 18000 Hz. A ultrasonic sensor transmits ultrasonic waves into the air and distinguishes reflected waves from a protest as shown in Fig.3. Ultrasonic sensors are devices that utilization electrical- mechanical vitality change, the mechanical vitality being as ultrasonic waves, to gauge separate from the sensor to the objective question. Ultrasonic waves are longitudinal mechanical waves which go as a progression of compressions.

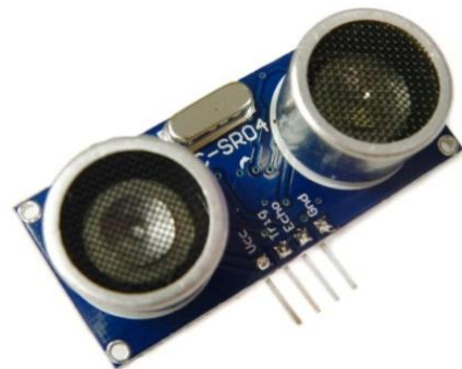


Fig.3. Ultrasonic sensor.

C. LDR

A Light Dependent Resistor (LDR) or a photo resistor is a device whose resistivity is an element of the episode electromagnetic radiation. There are a wide range of images used to demonstrate a LDR, a standout amongst the most usually utilized image is appeared in the figure underneath. The bolt demonstrates light falling on it. A photo resistor or light - dependent resistor (LDR) or photocell is a resistor whose protection diminishes with expanding episode light power; at the end of the day, it shows photoconductivity. A photo resistor is made of a high protection semiconductor as shown in Fig.4. On the off chance that light falling on the device is of sufficiently high recurrence, photons consumed by the Semiconductor give bound electrons enough vitality to bounce into the conduction band.

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Fig.4. A typical LDR.

A LDR is made of a high-protection semiconductor. On the off chance that light falling on the device is of sufficiently high recurrence, photons consumed by the semiconductor give bound electrons enough vitality to hop into the conduction band. The subsequent free electron (and its opening accomplice) conducts power, in this manner bringing down Protection.

D. Soil Moisture Sensor

This sensor can be utilized to test the moisture of soil, when the soil is having water deficiency, the module yield is at abnormal state, else the yield is at low level. By utilizing this sensor one can naturally water the blossom plant, or some other plants requiring programmed watering strategy. Module triple yield mode, computerized yield is straightforward, simple yield more precise, serial yield with correct readings. Soil Moisture Sensor is a basic breakout for estimating the moisture in soil and comparable materials. The soil moisture sensor is truly straight forward to utilize as shown in Fig.5. The two vast uncovered cushions work as tests for the sensor, together going about as a variable resistor. The more water that is in the soil implies the better the conductivity between the cushions will be and will bring about a lower protection, and a higher SIG out. Soil Moisture Sensor working all you will require is to associate the VCC and GND pins to your Arduino-based device (or perfect advancement board) and you will get a SIG out which will rely upon the measure of water in the soil. One ordinarily known issue with soil moisture sensors is their short life expectancy when presented to a damp domain. To battle this, we've had the PCB covered in Gold Finishing (ENIG or Electro less Nickel Immersion Gold). We prescribe either a straightforward 3-stick screw stick terminal or a 3-stick jumper wire gathering (both can be found in the Recommended Products segment beneath) to be welded onto the sensor for simple wiring.

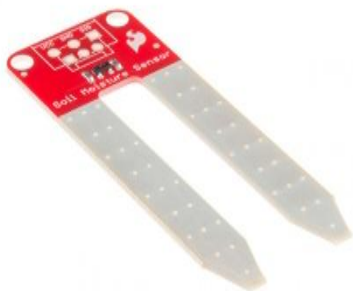


Fig.5. Soil Moisture Sensor.

E. Buzzer

A buzzer is a mechanical, electromechanical, attractive, electromagnetic, electro-acoustic or piezoelectric sound flagging device. A piezo electric buzzer can be driven by a wavering electronic circuit or other sound flag source. A tick, beep or ring can demonstrate that a catch has been squeezed. Piezo buzzer is an electronic device generally used to create sound. Light weight, straightforward development and low value make it usable in different applications like auto/truck turning around marker, PCs, call ringers and so on. Piezo buzzer depends on the opposite guideline of piezo power found in 1880 by Jacques and Pierre Curie. It is the wonders of creating power when mechanical weight is connected to specific materials and the other way around is additionally valid. Such materials are called piezo electric materials. Piezo electric materials are either normally accessible or synthetic. Piezoceramic is class of artificial material, which postures piezo electric impact and is generally used to make circle, the core of piezo buzzer. At the point when subjected to an exchanging electric field they extend or pack, as per the recurrence of the flag in this way delivering sound.

F. Voice Playback Module

The Voice module board depends on ISD18B20, which is a solitary chip single-message record/playback device. Chronicles are put away into on-chip non-unpredictable memory, giving zero-control message stockpiling. With the installed Flash memory utilized, information maintenance up to 100 years and regular 100,000 delete/record cycles can be come to. Time for recording is 8-20 seconds. The ISD1820 voice module board might be a smart response for an extra single sound impact to an undertaking. These sheets can record a solitary sound example of up to 10 seconds utilizing an inherent mouthpiece and will play back the example on request with great constancy. There are two playback modes. The first is edge set off; a positive heartbeat to the Playback-E stick triggers the module to play the whole message once. The second strategy, level activated, will play the account while it is high, and quit playing when it is low. This module utilize is simple which you could coordinate control by push catch on board or by microcontroller, for example, arduino.

Pin Configuration:

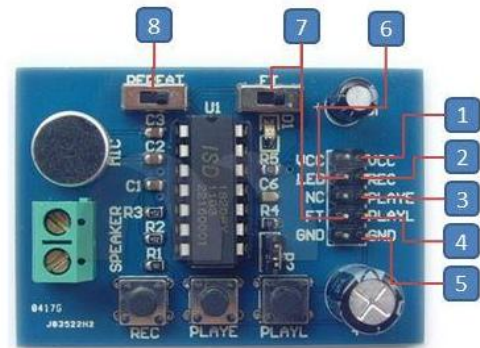


Fig.6. Pin configuration of voice playback module.

- VCC: 3V-5V DC
- REC: active-HIGH record signal

- PLAYE: active-HIGH playback, edge-activated signal
- PLAYL: active-HIGH playback, level-activated signal
- GND: ground
- LED: LED (D1)
- FT: active-HIGH feed though

G. Blynk Cloud APP

Blynk was intended for the Internet of Things. It can control equipment remotely, it can show sensor information, it can store information, picture it and do numerous other cool things. Blynk is a stage with iOS and Android applications to control Arduino, Raspberry Pi and the preferences over the Internet. It's an advanced dashboard where you can assemble a realistic interface for your venture by just relocating gadgets. It's extremely easy to set everything up and you'll begin tinkering in under 5 mins. Blynk isn't attached to some particular board or shield. Rather, it's supporting equipment of your decision. Regardless of whether your Arduino or Raspberry Pi is connected to the Internet over Wi-Fi, Ethernet or this new ESP8266 chip, Blynk will prepare you on the web and for the Internet Of Your Things as shown in Fig.7.



Fig. 7. Blynk app Overview

There are three major components in the platform.

- **Blynk App** - allows to you create amazing interfaces for your projects using various widgets we provide.
- **Blynk Server** - responsible for all the communications between the Smartphone and hardware. You can use our Blynk Cloud or run your private Blynk server locally. Its open-source, could easily handle thousands of devices and can even be launched on a Raspberry Pi.
- **Blynk Libraries** - for all the popular hardware platforms - enable communication with the server and process all the incoming and out coming commands.

Blynk was designed for the Internet of Things. It can control hardware remotely, it can display sensor data, it can store data, visualize it and do many other cool things. There are three major components in the platform:

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V. ALGORITHM

1. Start the program
2. If $d > 100$ in ultrasonic sensor: Voice playback module gets activated Else Voice playback module gets deactivated
3. If $t > 500$ in soil moisture sensors: Buzzer on Else Buzzer off.
4. If $t < 500$ in LDR: Voice playback module gets activated Else Voice playback module gets deactivated
5. Repeat the above steps .
6. Stop

VI. RESULT

The voice alarms can be perceptible through the speaker which shows the obstacles and the present circumstance outside i.e. either light or dull. The moisture sensor sense the water and the comparing yield will be perceptible through the buzzer as shown in Fig.8.

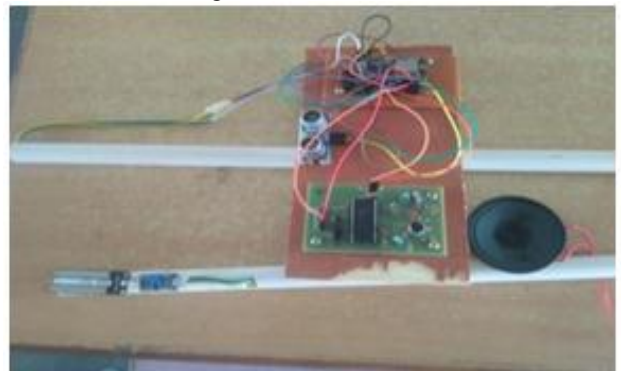


Fig.8. Prototype Hardware system.

The current location of the user can be notified to the caretaker using the map in blynkapp. It continuously tracks the location of the user as shown in Fig.9.

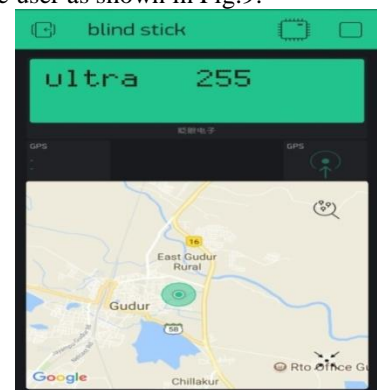


Fig. 9. Blynk app map location.

VII. CONCLUSION

The undertaking proposed the plan and design of another idea of keen electronic directing stick for blind individuals. The upside of the system lies in the way that it can end up being minimal effort answer for many blind individuals around the world. The proposed mixes of different working units makes an ongoing system that screens the situation of the client and gives the criticism making navigation more protected and secure.

Future Scope: The system can be supplemented with a vibration engine to give vibration to the incompletely hard of hearing individual. An extra circuit can be utilized in the pack that makes utilization of a RF remote for finding the area of the stick at whatever point it gets lost.

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