

# Smart Blind Stick using Arduino

ShobhanaSonwane, PriyankaGaidhane, Diksha Mohane,  
Nikita Gajbhiye, Akansha Patil, Tasneem Hasan

Department of Computer Science and Engineering, ITM College of Engineering, Nagpur, Maharashtra, India

## ABSTRACT

This paper depicts ultrasonic visually impaired strolling stay with the utilization of arduino. As indicated by WHO, Visually weakened can go from gentle extreme. Around the world, between 300 million individuals are outwardly impeded because of different causes. Roughly 50 million People are thoroughly Blind Approximately 80% of visual deficiency happens in individuals over 50years old enough. In the event that u notice them, you can think about it they can't stroll without the assistance of other. For Blind People with no Support Its Difficult to arrive at their Destination. They faces numerous issues in their day by day schedule everyday life. Vision misfortune was connected by methods for self-destructive considerations of self destruction endeavors, in another investigation from south Korea. "Individuals with visual Impairment regularly endure significant psychosocial results," the creators wrote in the British Journal Of Ophthalmology. Ophthalmology is a part of medication and medical procedure which manages the determination and therapy of eye issues.

## How to cite this paper:

ShobhanaSonwane | PriyankaGaidhane | Diksha Mohane | Nikita Gajbhiye | Akansha Patil | Tasneem Hasan "Smart Blind Stick using Arduino" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-4 | Issue-6, October 2020, pp.431-434, URL: www.ijtsrd.com/papers/ijtsrd33411.pdf



Copyright © 2020 by author(s) and International Journal of Trend in Scientific Research and Development Journal. This is an Open Access article distributed under the terms of the Creative Commons Attribution License (CC BY 4.0) (<http://creativecommons.org/licenses/by/4.0>)



## I. INTRODUCTION

Here Blind stick water sensor, Buzzer, Solor board, Vibrator, Arduino UNO R3, IR sensor are utilized. Arduino UNO R3 is a microcontroller which can do all the counts fastly and rapidly with incredible precision. Ultrasonic sensor is utilized for recognizing obstruction. For Example, Water, darkness, People. IR Sensor which is utilized as snag locator where it sends the infrared waves and hits the item and reflected back the sign to sensor. those b who have visual intensity of 6/60 or the even scope of visual field with the two eyes open have not exactly or equivalent to 20 degrees. These individuals are viewed as a visually impaired. a servey by WHO(world wellbeing association ) did in 2011 assessments that on the planet ,about 1%of the human populace is outwardly impared (around 70 million individuals and among them ,about 10% are completely visually impaired (about 7million individuals) 90% (around 63 million individuals).

## II. RELATED WORK

R. Radhika, P.G. Pai, S. Rakshitha and R. Srinath[3] planned and executed a Smart Stick for Obstacle Detection and Navigation. Their proposed framework used infrared, ultrasonic and water sensors. M.H. Mahmud, R. Saha and S. Islam[4] proposed a Smart Walking Stick which is an Electronic Approach to Assist Visually Disabled Persons. Their gadget is a microcontroller based computerized equipment that can help an ignorant concerning recognize snags before him/her speedily. The equipment comprises of a microcontroller PIC16F690 joined with ping sonar sensor, nearness sensor, wet indicator, a GH311 Ultrasonic impediment sensor, a miniature pager engine and extra gear. The straightforwardness of the proposed plan makes it simple to use by any individual and simultaneously the expense of assembling such sticks is kept low. The force utilization of the proposed stick is low and can be worked without any problem. It is likewise exceptionally modest contrasted with the traditional ones. Aside from others dazzle direction frameworks; it has a fingernail regulator. This gives mechanical favorable position past anybody's creative mind. Running this coordinated arrangement of equipment requires an option in contrast to the battery. The utilization of sun powered boards for example, will be more beneficial so as to get revived. The proposed stick isn't bendable in this manner keeping it may be testing. This savvy and light weight gadget can be intended to take the example of a plastic and versatile gadget which can be totally fixed on the natural white stick or visually impaired stick. B. G. Roopashree, B. S. Patil and B. R. Shruthi[8] proposed Smart Electronic Stick for Visually Impaired. Their proposed

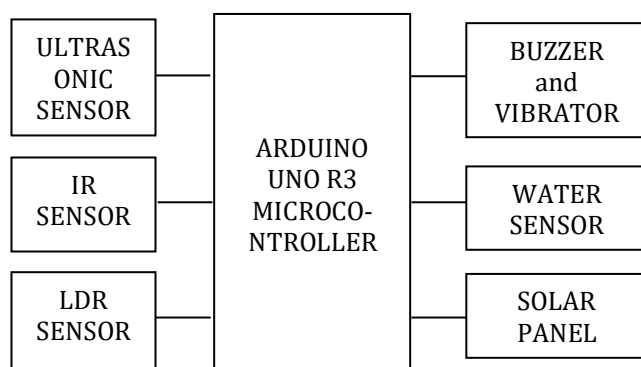


FIG.1 BLOCK DIAGRAM

framework is a hypothetical model and a framework idea to give a brilliant electronic guide to daze individuals. The framework is planned to give fake vision, object discovery and crisis informing office. Ultrasonic sensors figure the separation of the snags around the visually impaired individual to control the client towards the accessible way. Yield is as beep. A stick for separation estimation utilizing infrared sensors, have presented by S. Innet and N. Ritnoom [9] which is a complex and time squandering measure. The stick has distinctive vibration modes for various range which is hard for an oblivious to separate, it needs an ideal opportunity for preparing. The stick illuminates the individual obviously at hazardous stage which passes on less data and wellbeing. The stick has no area and situating highlights.

### III. HARDWARE REQUIREMENTS

#### A. ARDUINO UNO R3

Arduino UNO is microcontroller board and its utilized in atmega328p.it's 20 pins in this are utilized, out pin is called advanced pin and in pin are called as simple pins. digital pin and simple pin seem to be, 14 and 6 used. its utilized reset button, icsp header. power jack, gem, 16 mhz quartz, comparator pic microcontroller. The comport are utilized in AC-DC connector or battery.

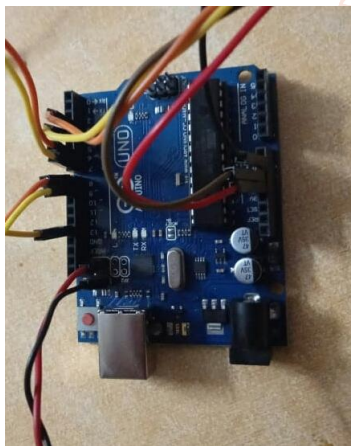


Fig.2 arduino UNO R3

#### B. ULTRASONIC SENSOR

Ultrasonic sensor utilized in identify the article and individual. its utilized the reverberation, trigger, and 4 pins ground. and this range least 10 mA. there are utilized in communicate the signs sender to beneficiary. this sensor are impart sign to another. ultrasonic waves at high recurrence and receive back the sign.

#### C. IR SENSOR

This sensor is utilized to recognize infrared waves and detect the obstacle. IR yield various relying upon infrared beam that have been gotten. it is one of the real time application and depend the IR module.

#### D. BUZZER

A transducer changes over electrical vitality into mechanical vitality t cap regularly works A ringer is in the lower part of the perceptible recurrence scope of 20 Hz to 20 kHz. This is cultivated by changing over an electric, swaying signal in the discernible range, into mechanical vitality, as perceptible waves. Bell is utilized in this exploration to caution the visually impaired individual against hindrance by producing sound corresponding to remove from snag.

#### E. LDR

Light Dependent Resistor (LDR), changes its protections because of progress of the light force. During night, LDR will have high opposition and no current go through it except for through a LED associated corresponding to it which lights up and goes about as a Flashlight, which can be handily seen by others. It makes individuals about the presence of visually impaired individual aware of let him to pass the way.

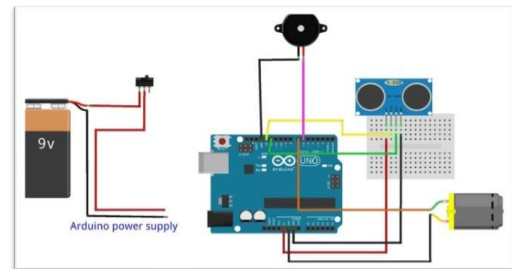


Fig.3: circuit diagram

#### F. MESSAGING FACILITY

In the event that some misfortune is occurred with the visually impaired individual and his relative needs to look through him than his relative press the base and GPS will send the connection to his relative and it accommodating to locate the visually impaired individual.



Fig. 4sim module

#### G. VIBRATOR

A vibrator engine is incorporated to improve the general criticism for the individual who gets the admonition against hindrances closeness in various organizations of vibrations.

#### H. WATER SENSOR

A water sensor is situated at the base of the stick to have safety measure against the wet surface which it can causing slipping on the floor and consequently can hurt. At the point when the water sensor comes in contact of the wet surface, it delivers an electrical sign which trigger. the Arduino regulator.

A voice guidance for wet surface is created and furthermore a signal is empowered for disturbing against a wet floor.

#### I. SOLAR PANEL WITH SELF CHARGING FACILITY

A board intended to assimilate the suns beams as a wellspring of vitality for producing power or warming. A sun based board changes over daylight into an electric flow or warmth used to give power to daze stick. Sun oriented boards are developed as an assortment of heaps of little sun based cell that are spread over an enormous region to give enough power the bigger the grouping of light hits the cell the greater power or warmth is delivered.

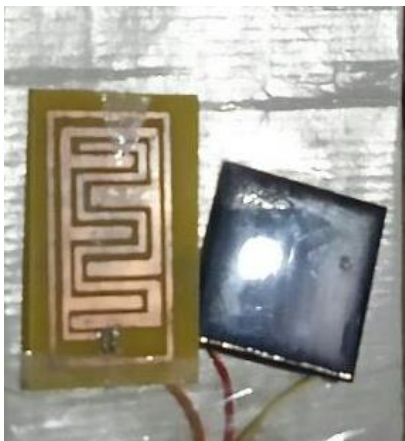


Fig. 5 water sensor and solar panel

GPS works in any climate conditions, anyplace on the planet, 24 hours per day, with no membership expenses or arrangement charges.

**A GPS signal contains different types of information:** Pseudorandom code is an I.D. code that distinguishes which satellite is communicating data. You can see which satellites you are getting signals from on your gadget's satellite page. Ephemeris information is expected to decide a satellite's position and gives significant data about the wellbeing of a satellite, current date and time. Chronicle information tells the GPS beneficiary where every GPS satellite ought to be whenever for the duration of the day and shows the orbital data for that satellite and each other satellite in the framework.

#### IV. NEO6M GPS MODULE

The NEO-6M GPS module is appeared in the figure underneath. It accompanies an outside radio wire and doesn't accompany header pins. So you should bind it.



Fig. 6(a) NEO6M gps module

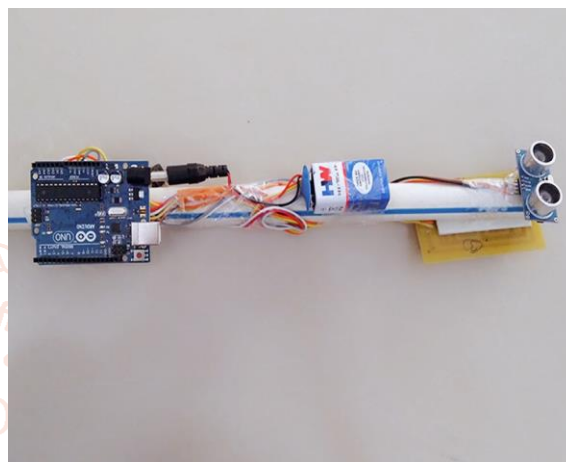


Fig. 7(a)Front view

#### Overview of NEO-6M GPS Module

The core of the module is a NEO-6M GPS chip from u-box. It can follow up to 22 satellites on 50 stations and accomplishes the business' most elevated level of affectability for example - 161 dB following, while at the same time expending just 45mA flexibly current. The u-box 6 situating motor likewise flaunts a Time-To-First-Fix (TTFF) of under 1 second. Probably the best component the chip gives is Power Save Mode (PSM). It permits a decrease in framework power utilization by specifically turning pieces of the beneficiary ON and OFF. This significantly lessens power utilization of the module to simply 11mA creation it reasonable for power touchy applications like GPS wristwatch. The vital information pins of NEO-6M GPS chip are broken out to a "0.1" pitch headers. This incorporates pins required for correspondence with a microcontroller over UART. The correspondence with this module is done through UART or RS232 Interface. The information is sent to the module or got from the module however UART interface. The regulator sends the information to the module through UART Interface dependent on convention arrangement in libraries. The module sends this information to another GSM client utilizing cell organization. In the event that the module gets any information from the cell organization (or another GSM client) it will send it to regulator through UART sequential correspondence. Along these lines we can utilize GSM900A module to set up cell association.



Fig. 7(b)Back view

#### Information about GPS

The Global Positioning System (GPS) is a satellite-based route framework comprised of in any event 24 satellites.

#### V. ADVANTAGES

- Auto location.
- Obstacle location with sign help.
- Simple to utilize and ease.



- GPS can assist the visually impaired individual with sourcing to objective course data.
- GPS can assist with finding the briefest and best way as likewise to Google.
- In sun based board, less devour power.

## VI. CONCLUSION

Light sensor is used to detect the presence or absence of light. Water sensor is used to detect the presence of water. Warning through voice and vibration. GPS for tracking user. The light sensor is used to detect presence or absence of light, if there is no light then the buzzer will be on, warning through vibration and voice message through earphone.

## VII. REFERENCES

- [1] Sung Jae Kang, et al." Development of an Intelligent Guide-Stick for the Blind", Proceeding of the IEEE international Conference on Robotics & Automation, 2001
- [2] Y. Kawai and F. Tomita, "A support system for visually impaired persons to understand three-dimensional visual information using acoustic interface", IEEE Conference on Pattern Recognition-Vol.3, pp.974-977, 2002.
- [3] J. M. Suez, F. Escolano, and A. Peñalver, "First steps towards stereo- based 6DOF SLAM for the visually impaired," in IEEE Conf. on Computer Vision and Pattern Recognition (CVPR), SanDiego, USA, 2005.
- [4] Alberto Rodriguez, et al., "Obstacle avoidance system for assisting visually impaired people", in proceeding IEEE Intelligent Vehicles Symposium Workshop, 2012.
- [5] Shruti Damhare, et al., "Smart stick for Blind: Obstacle Detection, Artificial vision and Real-time assistance via GPS", 2nd National Conference on Information and Communication Technology (NCICT), 2011.
- [6] Mohammad Hazes, et al., "Smart Walking Stick- an electronic approach to assist visually disable persons", International Journal of Scientific & Engineering Research vol. 4, No. 10, 2013.
- [7] J. Na, "The blind interactive guide system using RFID based indoor positioning system", Lecture Notes in Computer Science, Springer Publications, vol.4061, pp.1298-1305, 2006.
- [8] G. Prasanthi and P. Tejaswitha "Sensor Assisted Stick for the Blind People." Transactions on Engineering and Sciences, vol. 3, number 1, pp. 12-16, 2015.
- [9] Sung Jae Kang, et al." Development of an Intelligent Guide-Stick for the Blind", Proceeding of the IEEE international Conference on Robotics & Automation, 2001.
- [10] Y. Kawai and F. Tomita, "A support system for visually impaired persons to understand three-dimensional visual information using acoustic interface", IEEE Conference on Pattern Recognition-Vol.3, pp.974-977, 2002.
- [11] J. M. Suez, F. Escolano, and A. Peñalver, "First steps towards stereo- based 6DOF SLAM for the visually impaired," in IEEE Conf. on Computer Vision and Pattern Recognition (CVPR), SanDiego, USA, 2005.

