

# SMART GLASSES FOR VISUALLY IMPAIRED PEOPLE

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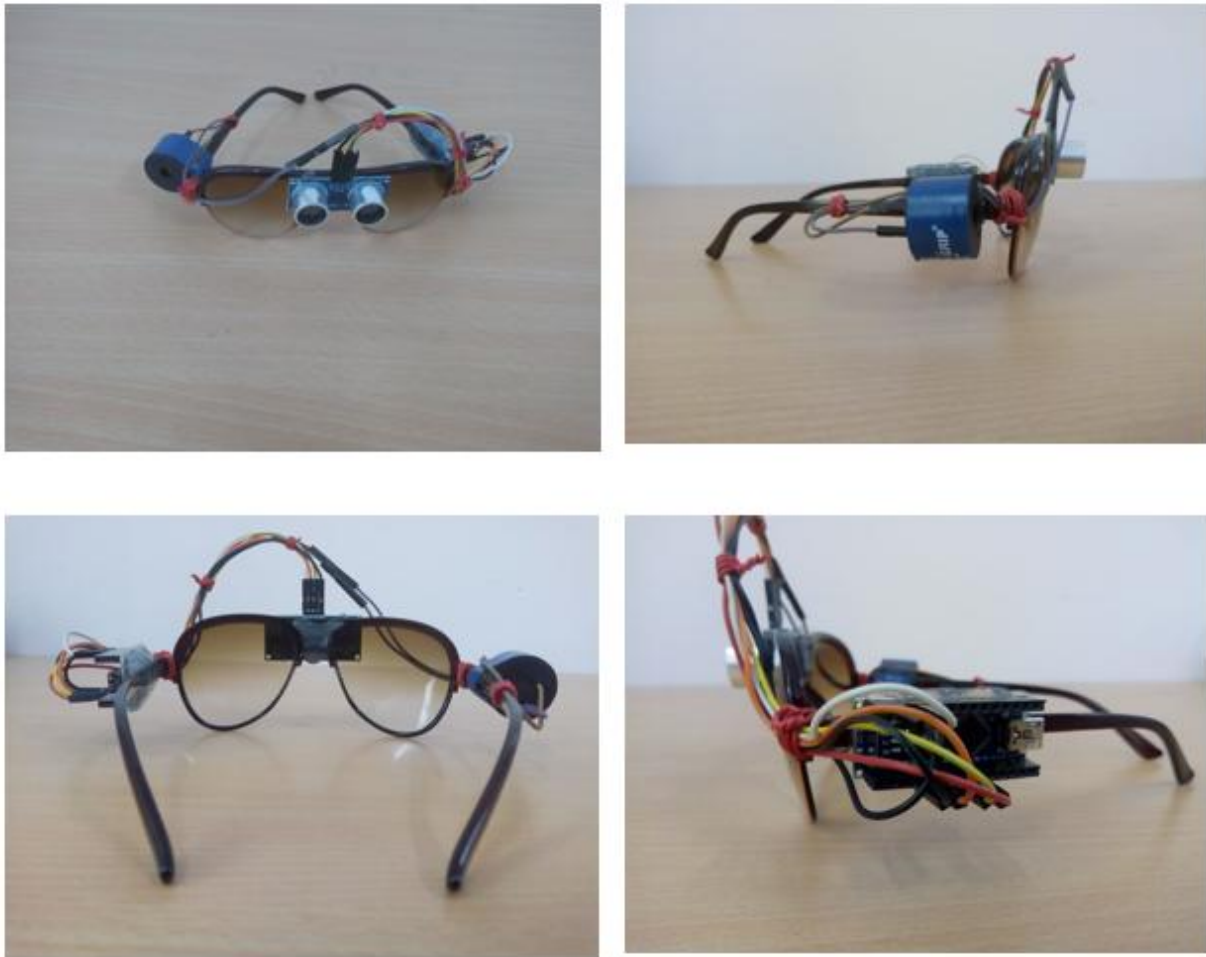
**Abstract:-** Technologies are rapidly evolving, allowing people to live healthier and simpler lives. Sightless people are unable to carry out their everyday activities, such as walking down the street, visiting friends or relatives, or doing some other mundane tasks. As a result, the Golden is a sensor based spectacles that can assist a person in walking safely without fear of colliding with another person or solid objects is proposed as a solution to this major issue. It is a development of the Golden eye as it acts as a companion for the blind when walking by sending audio alerts to the blind via a headphone connected to the phone with obstacles (water/walls/stairs / muddy ground) and also enables vibration motor to help him. Ultrasonic sensor, vibration motor, ir sensor, voice ic with ARDUINO controller was used for designing and simulating electrical circuits, was used to model the electric circuit. This system functions similarly to a white cane in that it assists blind people in scanning their surroundings for obstacles or orientation marks. This system will be mounted on a white cane with an ultrasonic sensor, and a ir sensor to detect changes in the environment. Ultrasonic sensors detect obstacles in front of it using ultrasonic wave reflection, ir detection sensors detect whether there is a puddle.

**Keywords:** Blind Stick, Smart Systems, Embedded Systems. Android.

## I. INTRODUCTION

This proposed methodology is designed to create a smart blind stick for visually disabled person. Physical development is a test for visually disabled people, since it can end up precarious to recognize hindrances showing up before them, and they are not ready to move starting with one spot then onto the next. They rely upon their families for portability and guidance. Their versatility contradicts them from associating with individuals and social exercises. Before, various frameworks are structured with restrictions without

a strong comprehension of the any visual observation. Analysts have gone through the decades to build up an insightful and shrewd stick to help and caution outwardly weakened people from obstructions and give data about their area. People who can't see may face many difficulties to connect to the environment. It's very difficult for a blind people to detect the obstacles in front of them unless and until the stick touches it. With a normal stick, they will use tap method in which stick is continuously tapped on the ground continuously to find the optical nearby but it is not sufficient. This is the reason why they are dependent on their family or people nearby. With this methodology this problem can be solved. This system consists of a concept to provide a smart electronic aid for blind people, both in public and private space. The proposed system contains the ultrasonic sensor, ir sensor, vibration motor arduino and voice module with speaker. This proposed methodology consists of ultrasonic sensors present on the spectacles which emits and ultrasonic waves to detect the obstacle with large distance and proximity sensor is used to detect the obstacle which is closer to the stick. Once the obstacle is within the area of the sensor depending upon the magnitude of the distance intensity of the sound is varied according to the magnitude of the distance which is directly proportional to the intensity of the sound. Smart glasses is specially designed to detect obstacles which may help the blind to navigate care-free. The beep messages will keep the user alert and considerably reduce accidents. In normal blind sticks it's tough to find the digs and water present on the surface. This system consists of a ir detector which can detect the water present in the surface and digs. In visually impaired schools there are numerous experts who are explicitly prepared to show individuals with visual impedances how to travel securely, certainly, and autonomously in the home and the network. These experts can likewise help dazzle individuals to work on going on explicit courses which they may utilize regularly, for example, the course from one's home to a comfort store. Getting comfortable with a domain or course can make it a lot simpler for a visually impaired individual to explore effectively. This device is especially made for the betterment of blind person. This device is light in weight and portable. But its range is limited due to its own size. It gives the best travel help to the individual. The visually impaired individual can move starting with one spot then onto the next freely without the others help. The fundamental point of the framework is to give an effective route help to the visually impaired people who give a feeling of vision by giving the data about their environment and articles around them.



**Fig 1 Golden Eye**

## **II. LITERATURE SURVEY**

This previous system is integrated with ultrasonic sensors for various distance of the obstacle. This system uses first ultrasonic sensor to detect the obstacle for larger distance and then it calculates how much distance between obstacle and stick. The other sensor is infrared sensor which is used to detect the obstacles which is closer to the stick.

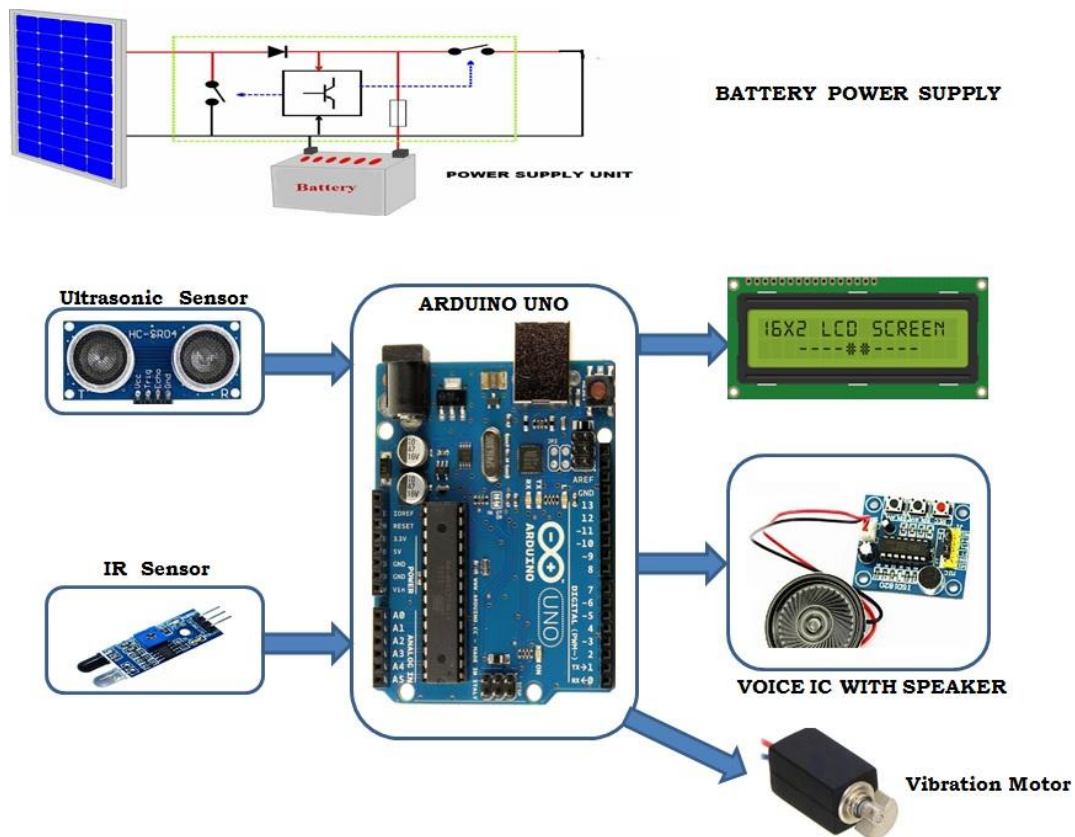
This system shares the user's latitudes and longitudes to their relatives which is used to find the current location of the user [2]. The microcontroller utilized in this General Packet Radio Service and Global System for Mobile based gadget with client input interface can be ideally ARM7TADMI based LPC02148 microcontroller, which is having 0512KB blaze memory and 08 to 40 KB of SRAM and a few peripherals. The ARM7TADMI-S is a broadly useful 032-bit chip. The presence of obstacle will be sensed using an ultrasonic sensor. If

the obstacle comes in front of the range of ultrasonic sensor, user will get the information about the obstacle by hearing the sound which is generated by the buzzer connected to their stick [3]. GPRS module is utilized to know the present area where the visually impaired individual is available; he can likewise hear the sound message with respect to the heading that will be trailed by the visually impaired individual. GSM module is utilized by the visually impaired individual to contact to versatile numbers put away in the microcontroller if there should be an occurrence of any crisis.

The GSM is also used for sending the alert message to the relatives [4] Minimal effort ultrasonic distance estimation modules like Hc-Sr04 are a viable method to detect the nearby items and the separation between them. Regularly Robots utilize these to detect items or impacts and make suitable move. Ultrasound is a high recurrence sound (ordinarily, 40000 Hz is utilized). A short burst of sound waves (regularly just 08 cycles) is conveyed. At that point the "receive" transducer tunes in for a reverberation. In this manner, the rule of ultrasonic separation estimation is equivalent to with Radio-based radar. It discharges an ultrasound at 40 000 Hz, which goes through the air and if there is an item or impediment in its way It will skip back to the module. Considering the movement time and the speed of the sound, you can compute the separation. This proposed methodology consists of two types of ultrasonic sensors present on the stick which emits and ultrasonic waves to detect the obstacle with large distance and proximity sensor is used to detect the obstacle which is closer to the stick [5].

### **III. PROPOSED SYSTEM**

During the evaluation of this method, opinions on individuals with visual impairments were formed through discussions and interviews with users to identify resources designed for blind people with disabilities. The Design of a glasses Prototype for People with Visual Impairment Using Ultrasonic is discussed below. The views of blind people are one of the subjects addressed to receive feedback/appraisal from users. Three users were given the task of rating the prototype, as well as trying it out and responding to the statements made.



**Fig 2 Proposed block diagram**

Based on the findings, it can be inferred that ultrasonic sensor sticks have proven to be extremely beneficial to blind people. This prototype has reduced the risk of blind people getting into accidents in difficult road structures with many obstacles, as well as when crossing the street. Since a large gap between the stick and the sensor can result in constant censorship of objects recognized around the stick, the design of the blind stick is made more flexible on the stick section, which is something to consider. The stick works by creating an Android-based mobile application that links the stick to the phone and performs a variety of tasks, including making phone calls to pre-determined numbers and determining the location. The stick is distinguished by its low price and simple nature. When the wireless sensor detects an object or obstacle in its environment, it serves as an input or input to the processor. The audio jack connected to the speaker then emits sound. The lack of essential skills and preparation, as well as the limited range of motion and knowledge transmitted, are among the most serious shortcomings of these aids. Electronic assistive devices are intended to solve issues like these, and we used some electronics modules and sensors to adjust the cane. A speaker, ultrasonic sensors, and a irsensor are all included. The blind person walking with



electronic glasses. One ultrasonic sensors are mounted on the stick having a set to different ranges for avoiding small obstacles. Three push buttons that can be operated with the thumb allows the blind user to send a general message (I am in trouble, help me) on a saved mobile no, or make a call for help. Vibrating sensors along with a buzzer used for beep and vibration if the stick is about to hit any obstacle. The circuit box contains a combination of microcontroller circuitry. The co-operation between the Ultrasonic and others sensors are utilized to create a complementary system that can give reliable distance measurement. A schematic circuit is made to make it easier to make tools. The schematic consists of Arduino uno, Battery, Ultrasonic Sensor, water sensor. The ultrasonic sensors in our proposed project are used to detect obstacles ahead using ultrasonic waves. When the sensor detects obstacles, it sends the information to the Arduino uno. The Arduino uno then analyzes the information and determines if the obstacle is near enough. If the obstacle isn't near enough, the circuit has no impact. If the obstacle is approaching, the Arduino uno issues a voice warning. It also senses water and warns the blind by sounding. The vibrator is also included in the stick. If the obstacle is approaching, the Arduino uno vibrates to alert you. A water sensor is used to sense water.

## **IV. SYSTEM DESCRIPTION**

### **A. Ultrasonic Sensor**

It is an ultrasonic sensor, also known as an ultrasonic transducer, that is based on a transmitter and receiver and is primarily used to determine the distance from a target object with a wavelength ranging from 20kHz to 20 MHz [5]. Ultrasonic sensors, like sonar detectors, work by transmitting a pulse of sound outside the range of human hearing. At the speed of sound (340 m/s), this pulse travels away from the range finder in a conical shape. The sound bounces off an object and is reflected in the range finder. This is interpreted as an echo by the sensor, which measures the time between transmitting the signal and receiving the echo. The object's distance is then calculated using this interval by a controller in simple notation[6]: The ultrasonic sensor is a robust and flexible sensing agent with relatively few limitations .Our ultrasonic sensors are in the air, non-contact object detection and ranging sensors that detect objects within an area. These sensors are not affected by the color or other visual characteristics of the detected object. Ultrasonic sensors use high-frequency sound to detect and localize objects in a variety of environments. Ultrasonic sensors measure the time of flight for the sound that has been

transmitted to and reflected from nearby objects. Based upon the time of flight, the sensor then outputs a range reading.

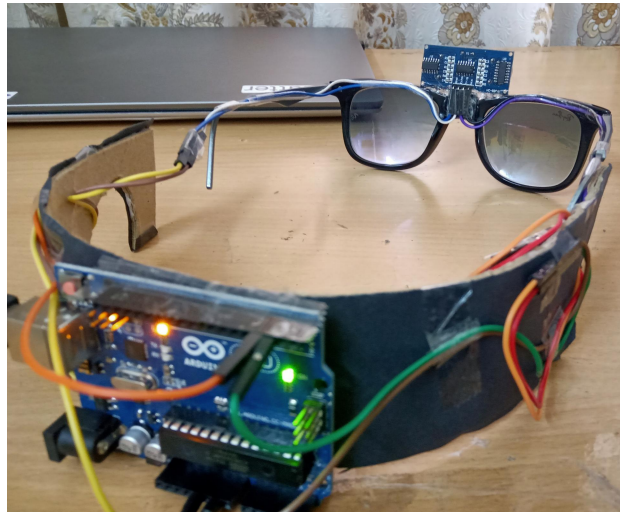
### ***B. Arduino***

Arduino is open source, both in its software and hardware specification so that hobbyists can assemble the simplest Arduino modules themselves by hand. More sophisticated pre-assembled Arduino modules can be purchased and are modestly priced. The hardware comes in many format specifications, from a small wearable device to larger surface-mounted modules. The primary mode of computer connection is via USB, though Bluetooth, serial, and Ethernet form factors also exist.

The Arduino software is free and open source. The programming platform is based on the popular Wiring language. The IDE is based on Processing, which is a well-known language among designers. Unlike most microcontroller interfaces, Arduino is cross-platform, so it can be run on Windows, Linux, and macOS. Open source projects like Arduino lower the barrier of entry for developers that are looking to experiment with interactive objects. These innovators will be able to rapidly prototype and experiment with interactive devices by using the Arduino platform, before creating a production-ready offering. The next Mark Zuckerberg or Steve Jobs may one day be found creating new ways for computers to interface with the physical world. Arduino is a great way to experiment with the possibilities of smart devices.

## **V. RESULTS**

The smart Golden Eye is design as shown in below figure the golden eye uses ultrasonic sensors mounted on the glasses so that it will assist in carrying out daily activities, the ir detector is placed at the front end of box which aims to detect whether the road to be inundated by persons or not and it connected to the speaker.



**Fig 3 Golden Eye Hardware circuit**



**Fig 4 Golden Eye Output**

## **VI. CONCLUSION**

The main objective of this methodology is to design a Golden eye glasses which is very much useful for those people who are visually impaired and are often need help from others. The Golden eye glasses has been finally made into model which can be utilized to manage the visually impaired. It's expects to take care of the issues looked by the visually impaired individuals in their everyday life. The framework additionally takes the measure to guarantee their safety. This proposed methodology will work to enable all the in blind people in regards to individuals on the planet to make them less demanding to walk



wherever they need. Golden eye glasses for visually impaired man can be utilized in numerous down to earth applications, for example, stuff bearers, shopping baskets and so on. This stage can be utilized as a learning stage for looks into in traversal of robot frameworks. This can be considered as an imperative use of the framework.

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