SMART BLIND STICK

A Project Using Modern Microcontroller

WHAT IS SMART BLIND STICK?

Smart Blind Stick is specially designed to detect obstacles which may help the blind to navigate care-free. A buzzer and vibrator motor helps to alert user both in public and private spaces. The equipped ultrasonic sensor send signals to a pre-programmed Arduino Nano board mounted on a breadboard, which directly communicates with the alarm unit. The device consumes very less owner through a changeable 9V battery making the model economic and conventional.

ORDINARY BLIND STICK VS SMART BLIND STICK

In Ordinary blind sticks

- Obstacle / object detection is not possible.
- It does not provide any type of user alarming system.
- They are tough to navigate in public places.

ORDINARY BLIND STICK VS SMART BLIND STICK

The Smart Blind Stick is,

- Designed to improve the mobility of both visually impaired and blind people.
- The model is lightweight.
- Adaptable to any ordinary blind stick/cane.
- Powerful ultrasonic sensor is attached to Arduino Nano board.
- The model also has, both buzzer and vibrator motor to alarm user regarding possible obstacles surrounding him or her.
- The device is been powered by a changeable and affordable battery.

PROBLEM STATEMENT ANALYSIS

Blindness or visual impairment is a condition of lack of visual perception, which leads to inability to see objects, including light. The person cannot recognize the size or the distance of the object. They have very little contact with the surroundings. Any physical movement for them is a challenge in itself, it can be difficult for them to distinguish obstacles appearing in front of them. Resulting a social isolation and lack of mobility for these physically challenged people.

COMPONENTS REQUIRED

Arduino NANO

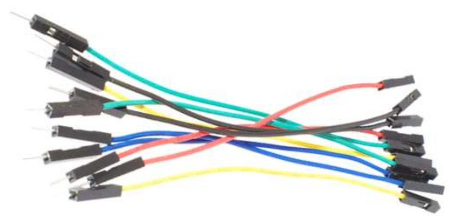
3V Buzzer

6V Vibration Motor

Slide Switch

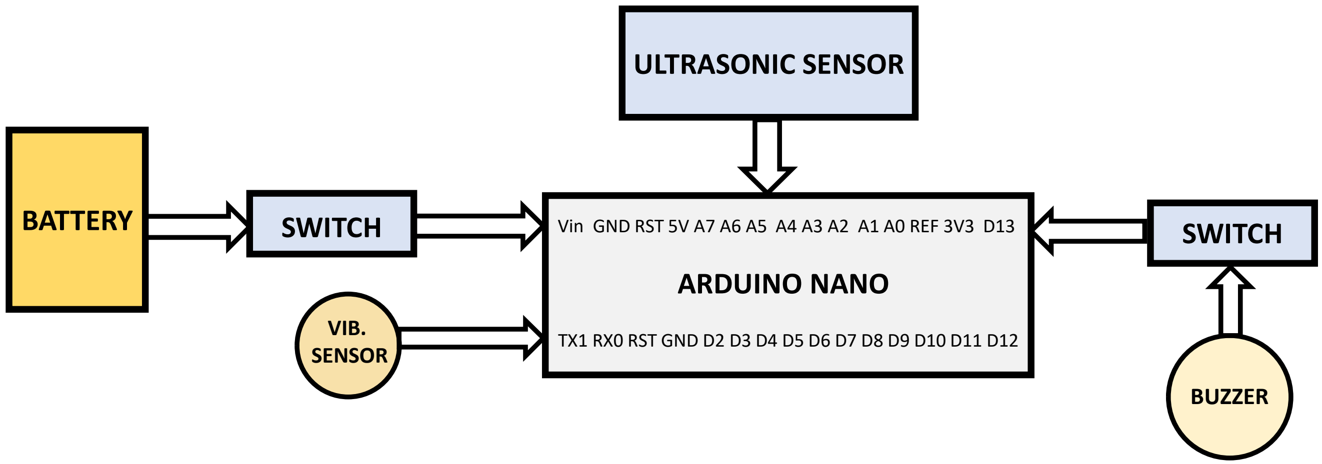
HC-SR04 US Sensor

9V Battery

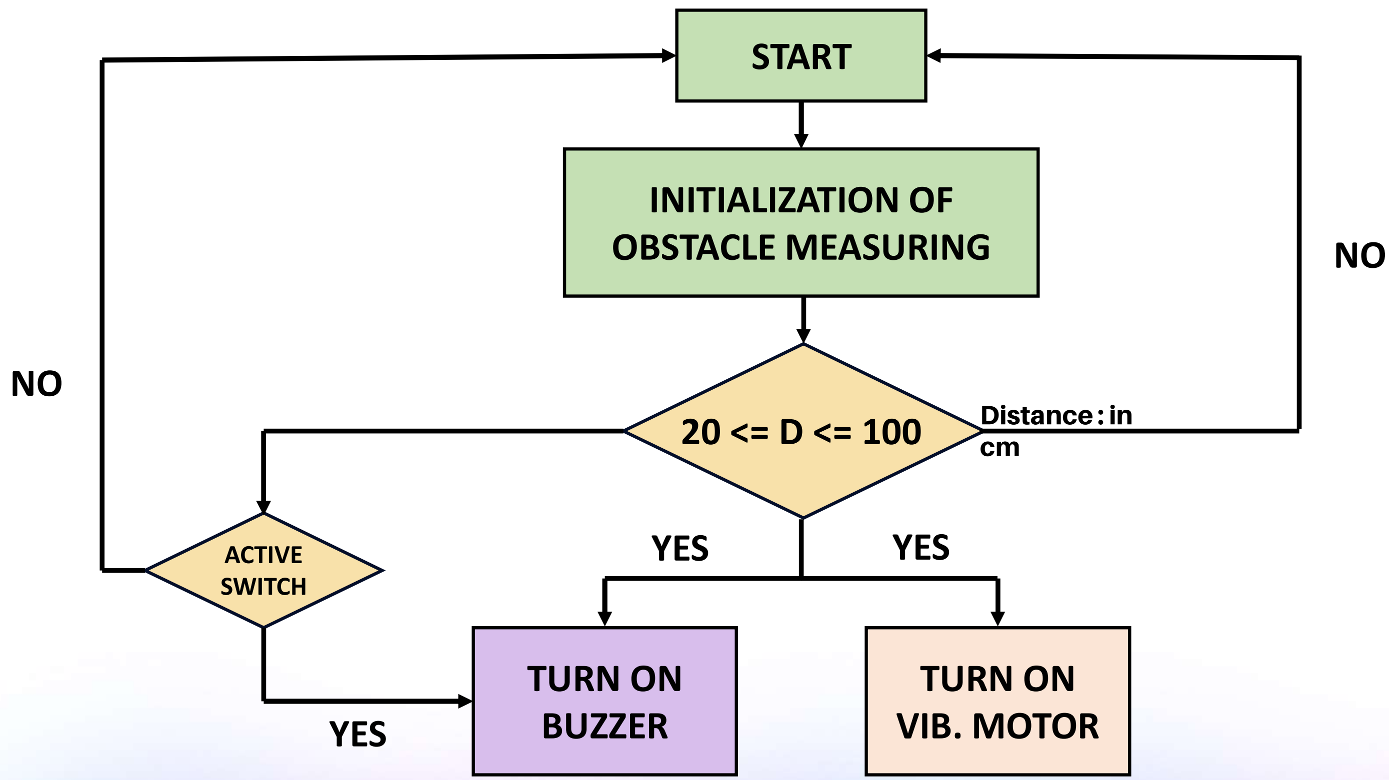


Jumper Wire

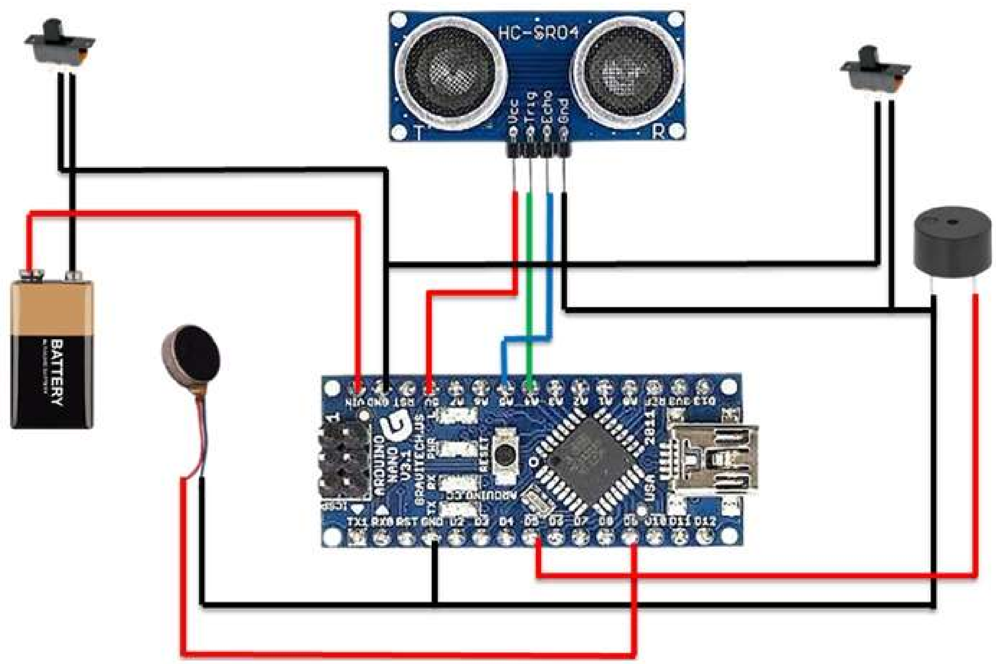
SYSTEM DESIGN OF THE MODEL

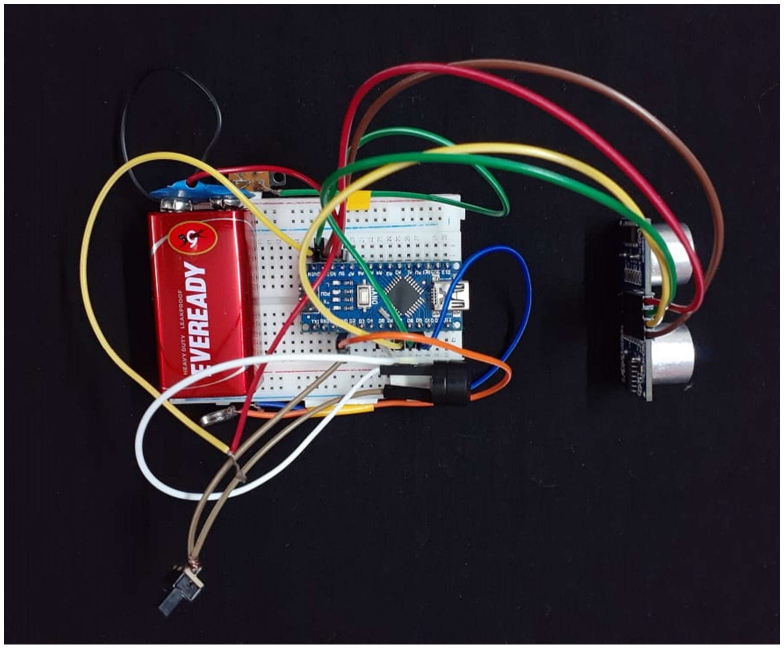


FLOW CHART OF THE MODEL

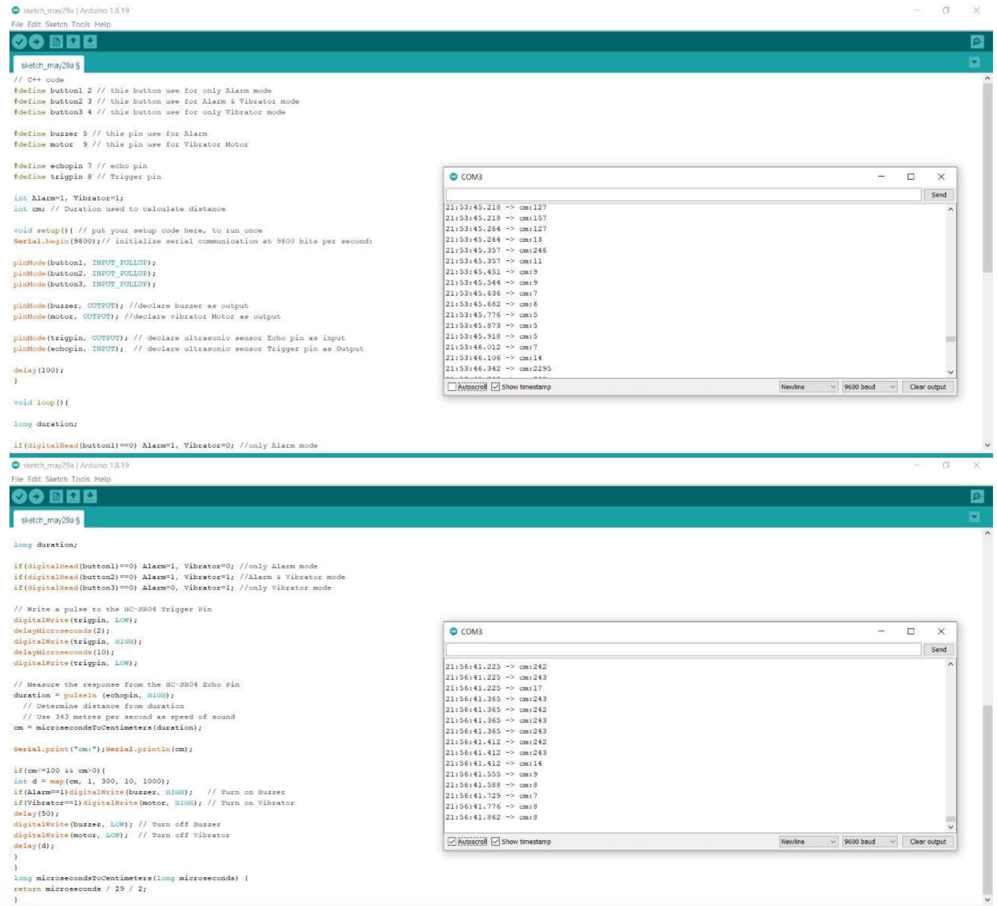


CIRCUIT DIAGRAM



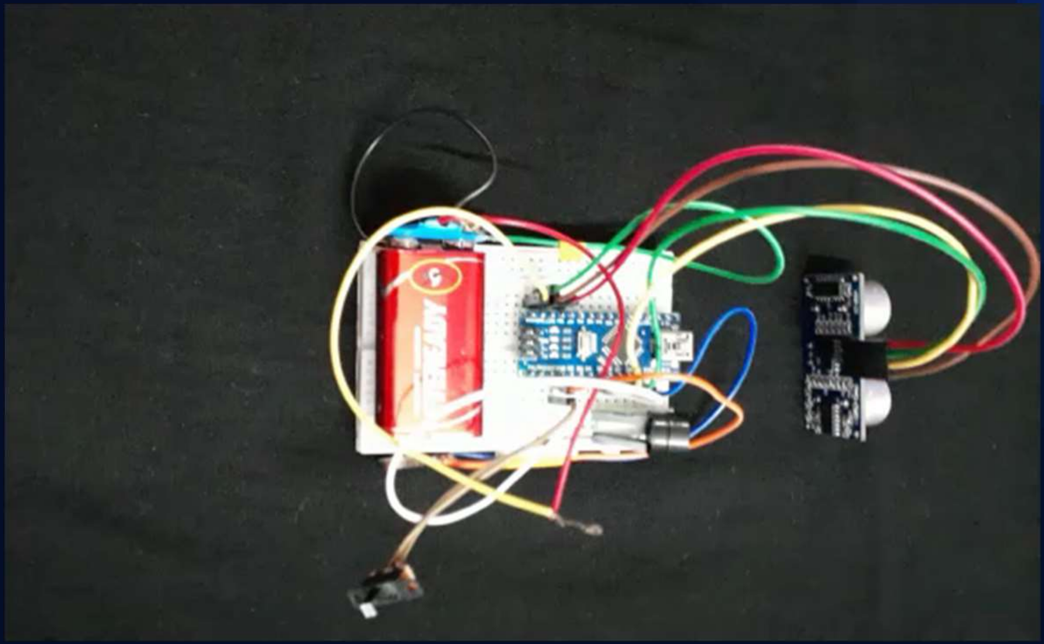


PHYSICAL MODEL OF THE PROJECT



DISTANCE SENSING WITH CODE

VIDEO DEMONSTRATION OF THE PROJECT



FUTURE SCOPE OF THE PROJECT

1) Low design time.
2) Low production cost.
3) This system is applicable for both the outdoor and indoor environment.
4) Less space.
5) Low power consumption.
6) Easy to use

Future work is going to be centered on enhancing the performance of the system and reducing the load on the user by adding the camera to guide the blind specifically. Pictures acquired by NI-smart cameras and web cameras helps in identification of objects further as scans the complete instances for the presence of a variety of objects within the path of the blind man. It also can detect the shape and material of the object. Matching percentage has got to be nearly all the time correct as there's no probability for correction for a blind man if it is to be reliable and trusty. The principles of the mono pulse radar can be used for finding long range target objects. Another scope may include a new concept of optimum and safe path detection based on neural networks for a blind person.

CONCLUSION

In the end of our project, we can conclude that our project can reduce the number of risk and injuries for the visually impaired person when walking at public. Nowadays, even at young age experience the visually impairment. This thing cannot be taken so lightly as they know how much risk could it be. If the number of risk and injuries increasing rapidly, the kid or the person will loss their spirit to walk independently. The Smart Blind Stick acts as a basic platform for the coming generation of more aiding devices to help the visually impaired to navigate safely both indoor and outdoor. It is effective and affordable. It leads to good results in detecting the obstacles on the path of the user. Though the system is hard-wired with sensors and other components, it's light in weight. Further aspects of this system can be improved via wireless connectivity between the system components, thus, increasing the range of the ultrasonic sensor and implementing a technology for determining the speed of approaching obstacles.

REFERENCES & ACKNOWLEDGEMENT

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IV. https://www.watelectronics.com/breadboard-construction-types-working/

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VI. Pooja Sharma, Mrs. Shimi S. L. "Design and Development of Virtual Eye for the Blind", IJIREEICE, Vol. 3, Issue 3, March 2015

Software used :

- **TinkerCad - online Arduino uno simulator**
- **Arduino IDE**