Third Eye For The Impaired

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Introduction

Need

- The device allow those that are unable to use their sight by detecting close by objects using ultrasonic waves and notify the user with a vibration or sound.
- According to WHO, globally the number of people of all ages visually impaired is estimated to be 285 million, of whom 39 million are blind.
- Every one of them is suffering from limited mobility to places and things they want to do.

Alternatives

Guide dog

The upside of owning a guide dog is you are guaranteed with extra safety. However, the con is the dog is very expensive, averaging from 50,000-60,000 dollars for one. And it takes at least 2-4 years of training before ready.

• White cane

Pros: affordable and very convenient.

Cons: The cane material is made from plastic which means easy to break. And it cannot detect silent vehicle

Purpose and Solution

An ultrasonic sensor glove that is designed to help the visually impaired by detecting obstacles in front of them. The design will produce a noise and flashing light which will notify the user and guide them to move more freely.

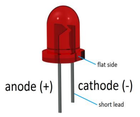
Components

Gloves

Arduino board

Ultrasonic Sensor

Buzzer



LED light

9V Battery

Testing

Physical

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Simulation

- Body Temperature
- Heart Rate
- Respiratory Rate
- Room Temperature

Designs

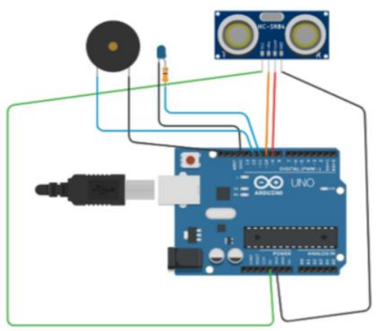


Figure 1: Diagram

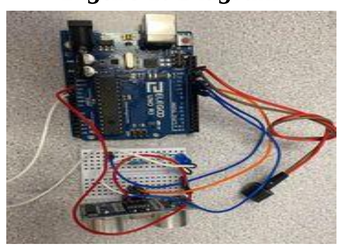


Figure 2: 3D picture

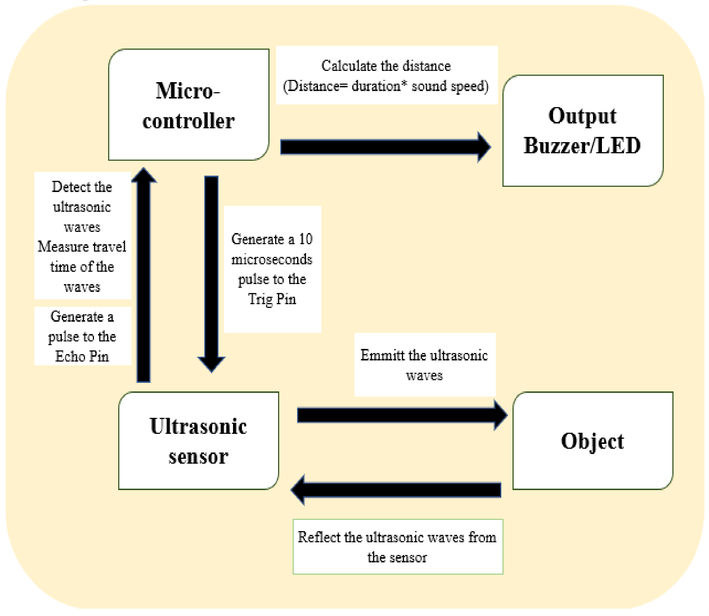
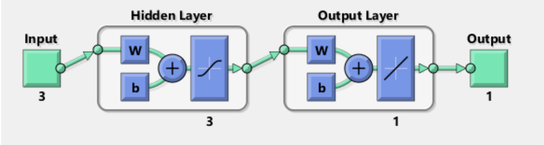


Figure 2: Flow Chart

Results



- Inputs: Heart Rate, Respiratory Rate, and Body Temperature
- Output: Healthy case or SIDS case
- •Choose to use equally as many hidden layers as inputs as to not run into overfitting issues

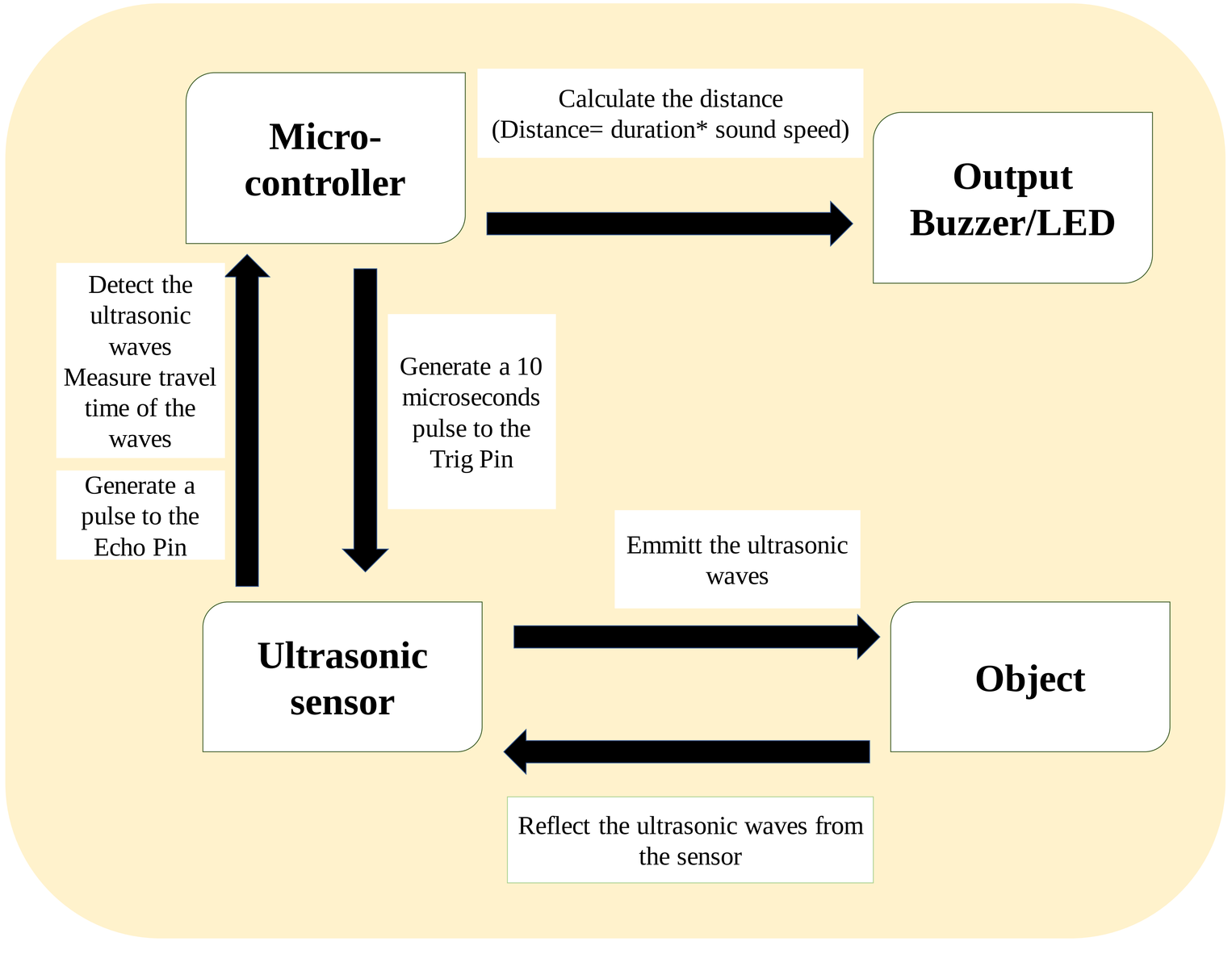
Conclusions and Future Directions

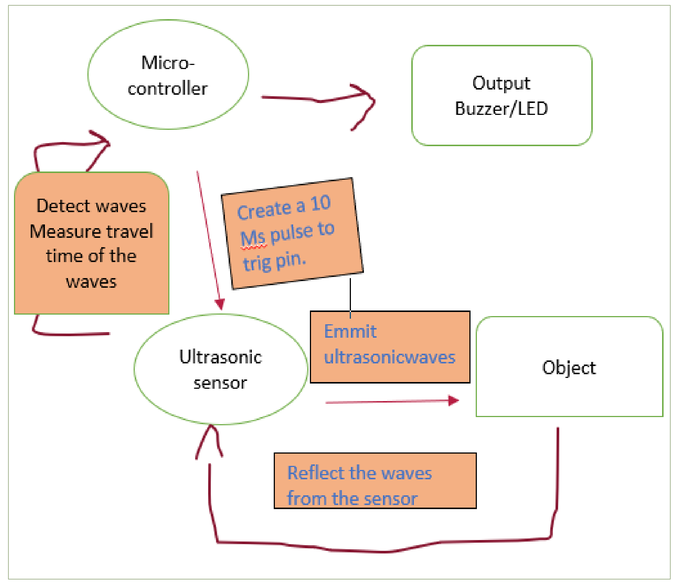
The SIDS diagnosis is inhuman in today's world due to the technologically advances society has made. It is time for us to use our most important modern inventions to protect our future.

- Create UI (user interface) to give parents a cleaner operating experience
- Bluetooth heart rate sensor (wires are obvious choking hazards)
- Advanced housing with mounting brackets for sensors
- Modularity; allow for customization (choose what vitals the parents wish to monitor)
- Develop software to extrapolate the data from the sensors, from there save the data to a larger database to develop trends

References

1. Cdc.gov. (2019). *FastStats*. [online] Available at: https://www.cdc.gov/nchs/fastats/births.htm [Accessed 14 Jul. 2019].
2. Sids.org. (2019). *What is SIDS/SUID? | American Sudden Infant Death Syndrome Institute*. [online] Available at: https://sids.org/what-is-sidssuid [Accessed 14 Jul. 2019].


Micro-controller
Calculate the distance (Distance= duration* sound speed)
Output Buzzer/LED
Detect the ultrasonic waves Measure travel time of the waves
Generate a pulse to the Echo Pin
Generate a 10 microseconds pulse to the Trig Pin
Emmitt the ultrasonic waves
Ultrasonic sensor
Object
Reflect the ultrasonic waves from the sensor


Micro-controller
Output Buzzer/LED
Detect waves Measure travel time of the waves
Create a 10 Ms pulse to trig pin.
Emmit ultrasonicwaves
Ultrasonic sensor
Object
Reflect the waves from the sensor