CRYSTAL CLEAR

SCIENTIFIC REPORT

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1. ABSTRACT

We plan to create a device that could be installed in cars to provide safety during periods of low visibility. For example, during fogs or sandstorms. The device will be activated as soon as the sensor determines low visibility. The device will provide a 360 degree view of the vehicles and other obstacles surrounding the car it is installed in on a screen which can be viewed by the driver. The device has ultrasonic sensors that use ultrasonic waves to measure the distance between the cars. It then sends this information back to the device which projects a moving image on the screen based on this input information. Hence, the driver will be able to navigate safely by looking at this image. We hope to reduce the number of accidents and deaths caused due to this problem with the help of our device. In addition to this, we plan to make sure our device is cost effective so that it is used by a larger number of people.

2. INTRODUCTION

Nowadays cars have become safer, more luxurious and more technically advanced. If you have a car that parks on its own or if you have seen that Ford advertisement, you should know that it uses ultrasonic sensors. What we did is that we took the sensors and transformed it into a safety device, a device that shows us the distance between the user's car and the cars around it. Now you may ask, why do we need this? Most new cars have cameras to show how close the user's car is to the cars around, but under foggy and dusty conditions, the visibility is low, even for the camera. Therefore, this device will prevent those accidents that occur during such erratic weather conditions.

2.1 PROJECT QUESTION

How can ultrasonic waves be used to determine the distance between cars and thereby help to display a live simulation of the vehicles and objects around it to prevent accidental hazards due to low visibility during fog, sand storms and dust storms?

2.2 WHY DID WE CHOOSE THIS PROJECT?

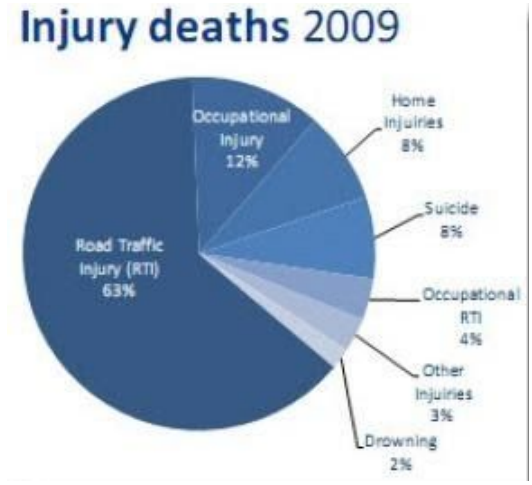
U.A.E is accustomed to sandy dust storms during the summer and thick fog during the winters. Fog and dust in the Middle East causes poor visibility on the roads. The number of Accidents that have occurred due fog have increased in the past years. Last year on the 5th of December, the Dubai police recorded 107 accidents and received 1602 phone calls from 4am to 9am. The

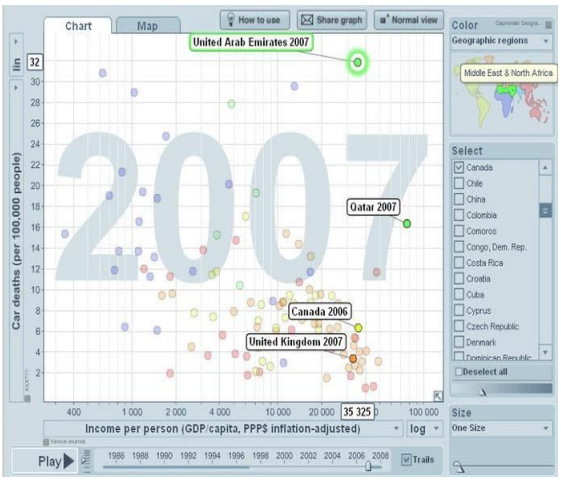
RTA and the Dubai government have implemented some ways to prevent these accidents. We as students would like to actively participate in reducing the hazard of accidents during fog and heavy dust storms. Therefore, we have devised a project that will allow the driver to see the car in front of him on the car screen and thereby reduce the risk of an accident. This simple and cheap solution will not only prevent accidents, but save lives in the Middle East.

3. BACKGROUND RESEARCH

3.1 ACCIDENTS TAKING PLACE IN THE U.A.E.

In the past few decades, U.A.E. has developed tremendously be it in terms of building architecture or increasing longevity. But even not U.A.E. has one of the highest death rates – 32 deaths per 100,000 which is very high as compared to U.K.'s 4 deaths per 100,000. A graph below shows the cause of the deaths that take place in the U.A.E. and Road traffic injury can be seen as a major reason for these deaths. The major reason for car accidents is found to be driving while intoxicated with alcohol, careless of the driver and low visibility. Accidents due to low visibility occur during the times of heavy fog and dust storms.





3.1.1 ACCIDENTS DUE TO FOG

Fog and smog cause a lot of accidents because a driver cannot see as far ahead. Fog can reduce the visibility to less than 1 km. Foggy conditions promote accidents because they affect perceptual judgments of speed and distance. The effects are the result of reduced contrast because during fog one sees an object based on the difference between the object brightness and background instead of the object's absolute brightness or darkness. Thus fog lowers contrast substantially, causing objects to become fainter and less distinct.

Due to lowered contrast, judgement of speed is affected and it becomes difficult for a driver to distinguish between a motionless object and an object in motion. For example, a man driving in fog may assume that the car in front of him is moving expecting it not to stop on a highway, but this might not always be true and the driver may fail to realize it until it is too late. Fog can also cause a driver to underestimate his own speed. Another reason due to which accidents occur in

the fog is "aerial perspective," a visual effect which causes people to misjudge distance. Therefore, a driver may judge the car in front of him to be at a farther distance, since the brain assumes that things with lower brightness are distant, but in reality the car might be just 5 - 10 meters away. Fog causes the eye to erroneously accommodate, resulting in blurred vision for more distant objects. This is caused by the "Mandelbaum Effect," the tendency of the eye to approach "resting" accommodation under conditions of poor visibility. Since resting accommodation is relatively short, a little over three feet, objects down the road will be out of focus.

Fog has caused many accidents in the U.A.E. The timeline below shows some of the major accidents that have occurred over the past few years due to low visibility. It can be seen that the amount of accidents due to fog has increased. **December 5, 2016** Dubai Police's Command and Control room recorded 107 traffic accidents across Dubai between 4 and 9am on Monday morning due to fog.

- **January 16, 2014** At least 14 people were injured in a 57-car pile-up on both sides of the motorway between Abu Dhabi and Al Ain after a thick fog suddenly descended.
- **December 3, 2013** An Arab man, 34, who failed to see an oncoming vehicle because of the fog, died instantly in Ras Al Khaimah. The driver of the other vehicle, an Emirati, 60, suffered minor injuries, as did his passenger, another Arab, 37
- **February 29, 2012** An Asian woman was killed after a car hit her on Corniche Road. An Asian lorry driver was killed after a crash near the Emirates Roundabout in Abu Dhabi in two fog-related traffic accidents.
- **April 2, 2011** A massive pile-up involving 127 vehicles occurred on the Abu Dhabi-Dubai highway caused by heavy morning fog that injured 61 people.
- **January 9, 2011** Two people were killed and 15 sustained injuries in separate road accidents that took place on several main and internal roads in Abu Dhabi due to low visibility and heavy fog at dawn.
- **September 14, 2010** Two youngsters were killed in a crash along the Tarif-Sweihan highway in Abu Dhabi due to foggy weather conditions.
- **March 10, 2010** Foggy weather conditions led to a serious road accident, which left one person dead and several others injured, involving 20-30 vehicles along the Lehbab-Jebel Ali Road, Dubai.
- **March 8, 2009** Fifty-four laborers and a driver were injured when their bus crashed into an outdoor advertising billboard on the outskirts of Ras Al Khaimah amid heavy morning fog which reduced visibility.
- **July 5, 2009** Three people died and two others were injured in four traffic accidents that took place in Abu Dhabi due to low visibility.
- **August 16, 2008** Over 17 cars crashed on the Al Ain highway, causing major traffic congestion on the road. The accident started when a taxi drifted off the road because of low visibility and foggy conditions, and bumped into a barrier on the road.
- **March 11, 2008** At least three people were killed and nearly 350 were injured in a horrific 60 vehicle pile-up on the Abu-Dhabi highway near Ghantoot caused by poor visibility due to think fog and lack of attention by motorists.

- **November 17, 2007** One person was killed and 13 people were injured, in accidents, in Dubai as a result of fog.
- **August 11, 2007** Seven people were killed and 11 injured in a bus and car collision caused by low visibility, fog and carelessness on Emirates Road.

3.1.2 ACCIDENTS DUE TO SAND STORMS

Sand storms occur more frequently in the Middle East as compared to fog. Moreover, they are very erratic and the time of occurrence is unpredictable and sudden. Sand storms, just like fog, reduce the visibility and cause accidents. However, the amount and intensity of accidents caused during a sand-storm is minimal compared to the ones that occur during fog. Sand storms in this region can be very high and can reduce the visibility to less than 500 meters at times.

One of the major casualties caused due to a dust storm was on 2nd April, 2015. The dust storm had caused 135 moderate to minor traffic accidents in Dubai. On the same day a 24 year old Emirati woman was also killed due to a car accident on the Dubai – Al Ain road. Many other such incidents have been reported which have caused a spike in the patient numbers in hospitals in U.A.E.

Experts suggest that the reason for most of these accidents was that the drivers were not able to see the car or the object that they crashed into in front of them. Keeping this fact in mind we have devised a project which will allow drivers to see the cars and objects in front of them on their car screen. This will overcome the problem of misjudgment of distance of the objects in front of the car and the estimation of the speed of the vehicles driving in front.

3.2 SOUND RANGING

Sound ranging is a process in which the distance between two points is determined by the use of sound waves. A transmitter produces a sound wave which on reflection from an obstacle returns back. The reflected sound wave is received by a receiver which is placed next to the transmitter. Using the time taken for the wave to reach back and by calculating the speed of air at that temperature the distance between the two points of emission and the obstacle is determined. Usually ultrasonic waves are used for this process

3.3 ULTRASONIC SOUND WAVES

Ultrasound is an acoustic wave with a very high frequency which is beyond the human ear's range of hearing. Since the audible frequency range for humans is said to be between 20Hz and 20 kHz, ultrasound generally means acoustic waves above 20 kHz. Bats, with their echo-location, can hear sounds up to 200 kHz, way beyond the capabilities of the human ear.

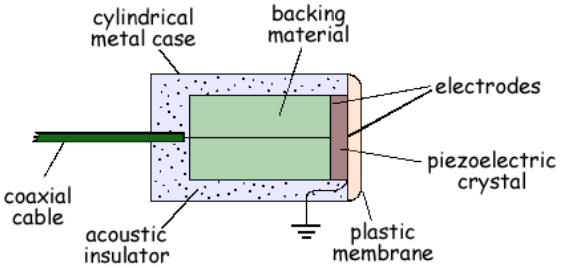
3.3.1 PROPERTIES OF ULTRASONIC SOUND WAVES

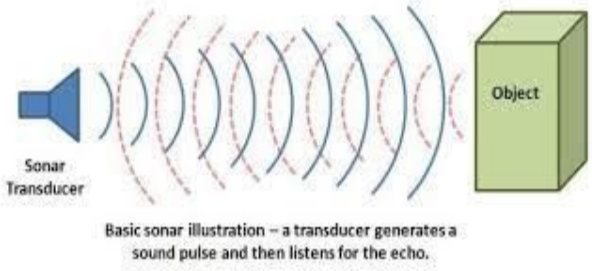
Ultrasonic sound waves are suitable for sound ranging, a process which is a vital part of our project, due to several of its characteristics. These waves have a very high wavelength due to which they are not reflected by the small objects and only return back when they encounter an object of substantial size, in this case a car or a pole. Ultrasound can be confined to a beam easily, unlike other waves. This means that ultrasound can be produced with high directivity. These waves do not scatter as easily as audible sound waves, therefore they will not be scattered by the dust particles in the sand storms or water droplets in the fog. Since these waves cannot be heard by humans, the use of these ways in our project will not disturb the driver or any pedestrians.

3.3.2 ULTRASONIC TRANSDUCER

Ultrasonic transducers are devices that comprise of transmitters, receivers and transceivers. Transmitters generate ultrasonic waves and receivers can convert the detected ultrasonic waves into electric signals for it to be analyzed. Transceivers on the other hand can both generate as well as receive ultrasonic sound signals. This device will be essential to our project as a camera transducer can be installed on the bonnet of the car, which will generate ultrasonic sound waves. The signals received by the receiver can be analyzed and used to create a moving image of the vehicles in front of it.

When an electric current is passed through an ultrasonic transducer, it converts the A.C. current into vibrations. These vibrations form sound waves, which propagate through the air and on reflection are received back by the transducer. This time the transducer converts the sound waves into electrical signals which are analyzed by a computer. The image below shows the construction of a transducer. The piezoelectric element refers to crystals that produce sound waves when electrical energy is supplied to it.





3.3.3 WILL ULTRASONIC WAVES SCATTER IN FOG?

Ultrasonic waves have a very big wavelength. Since waves can only be reflected by objects that have an area greater than the wavelength of the wave, ultrasonic waves will not be reflected by small particles. Usually dust particles and water droplets absorb waves and re-emit them, thereby dissipating them, but since the ultrasonic waves cannot be reflected by small particles, they do not get scattered that easily. This property of the waves also ensures that it will only be reflected from a solid and big obstacle only. Since ultrasonic waves are not affected by the water droplets or the sand particles, they are best suited for our project.

4. OUR OBJECTIVES

- To analyze the accidents that take place during dust storms, fog, and sandstorm and to find a way to minimize them.
- To discuss various waves that can be used for sound ranging in our project.
- To understand the properties and the uses of ultrasonic sound.
- To formulate hypotheses and conduct controlled experiments to test them.
- To record the different visibilities levels achieved during fog to test the fog detector.
- To record the results and compare the efficiency of different sensors.
- To discuss the implications of the results obtained and how ultrasound transducers can be integrated into the cars.
- To find ways to further develop our findings

5. HYPOTHESIS

- It is hypothesized that ultrasonic waves are the most suitable waves for sound ranging compared to laser waves, infrasonic waves and audible sound waves
- It is hypothesized that New Ultrasonic Module HC-SR04 Arduino sensor is the most efficient and accurate sensor which can be used in our project.

6. EXPERIMENTATION

6.1 EXPERIMENT 1

We conducted an experiment to determine visibility during fog and sand storms. To determine the most suitable location to install the fog detector.

6.1.1 MATERIALS USED

- A fog machine
- SL-FD-7100 fog detector
- A SLI battery
- A laptop or computer

6.1.2 PRINCIPLE

The detector calculates the visibility based on the amount of light scattered by the particles in the air. These particles can be water droplets, dust particles, etc. When a beam of light passes through one of these particles, it scatters it in different directions. The light whose direction is changed by more than 90 degrees is called backscattered light and the other part of the light emitted is called forward scattered light. The detector has a laser beam emitter that emits a narrow beam of red laser light form the front end of the detector. When this beam of light is scattered by a particle, the back scattered light travels in the direction of the detector. A receiver, which is usually placed behind the emitter, absorbs this light. Using the data collected from the light absorbed, it determines the presence of fog, sand storms, dust storms, haze, etc.

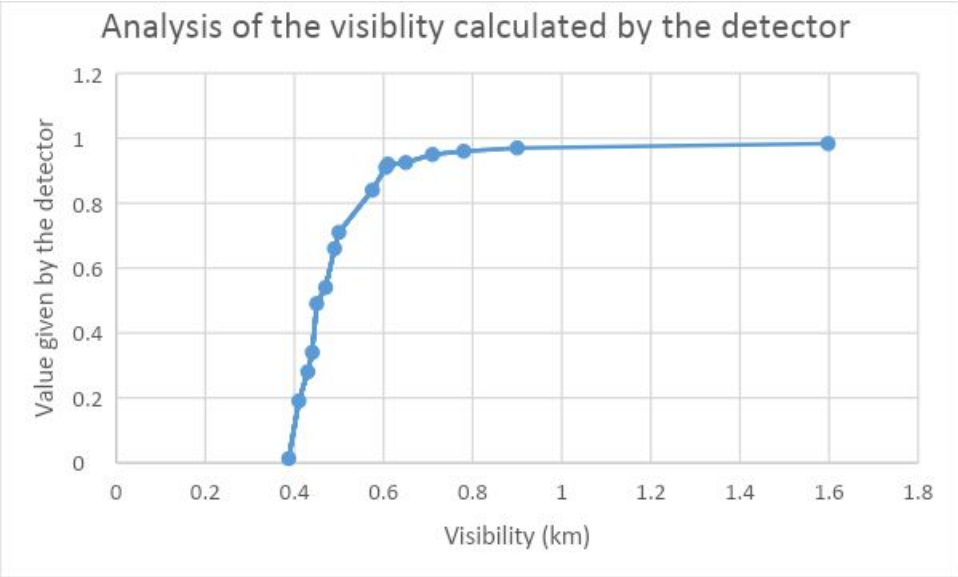
6.1.3 PROCEDURE

- Set up the fog machine in one end of the room. Make sure that there is a minimum 20 meters of empty space in front of the machine.
- Plug in the detector to a SLI battery and connect the input cable to a computer.
- Keep the level of the fog machine on low and press the start button.
- Record the data given by the fog detector.

- Repeat the experiment with different levels of the fog machine and record the values.

6.1.4 OBSERVATIONS AND DATA ANALYSIS

The value returned by the detector was plotted against the visibility that was determined.



The table below shows the visibility during different kinds of fog which was inferred from the graph

Type of Fog	Visibility	Value returned by the detector
No fog	12.7 km	Control value
Light fog	5km - 1.6 km	0.98- 3.10
Moderate fog	0.6 km	0.7 – 0.9
Heavy fog	0.2 km	0.4-0.5

6.1.5 RESULTS

It was concluded that the visibility reduces up to 0.2 km during heavy fog and to 1.6 km during light fog. The fog detector will be installed on top of the car. The values received from it will be immediately interpreted and the visibility will be calculated. Our device will start working as soon as the visibility falls down to 2 km. The driver can also switch it on manually if he feels that it is difficult for him to see.

6.2 EXPERIMENT 2

We conducted an experiment using different ultrasound transducers to determine which one is the most efficient for our prototype.

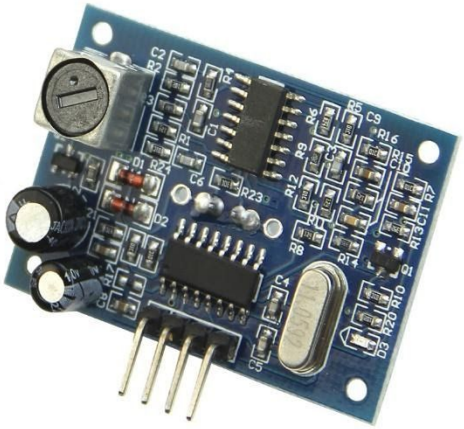
6.2.1 MATERIALS USED

- Arduino Uno SR04
- USB Cable to connect it to the computer
- Arduino UNO board SR04
- Breadboard
- Jumper Wires – 4
- New Ultrasonic Module HC-SR04 Distance Transducer Sensor For Arduino Robot
- Ultrasonic Module Distance Measuring Transducer Sensor Perfect Waterproof
- Arduino software and program code.

Sensor 1

New Ultrasonic Module HC-SR04

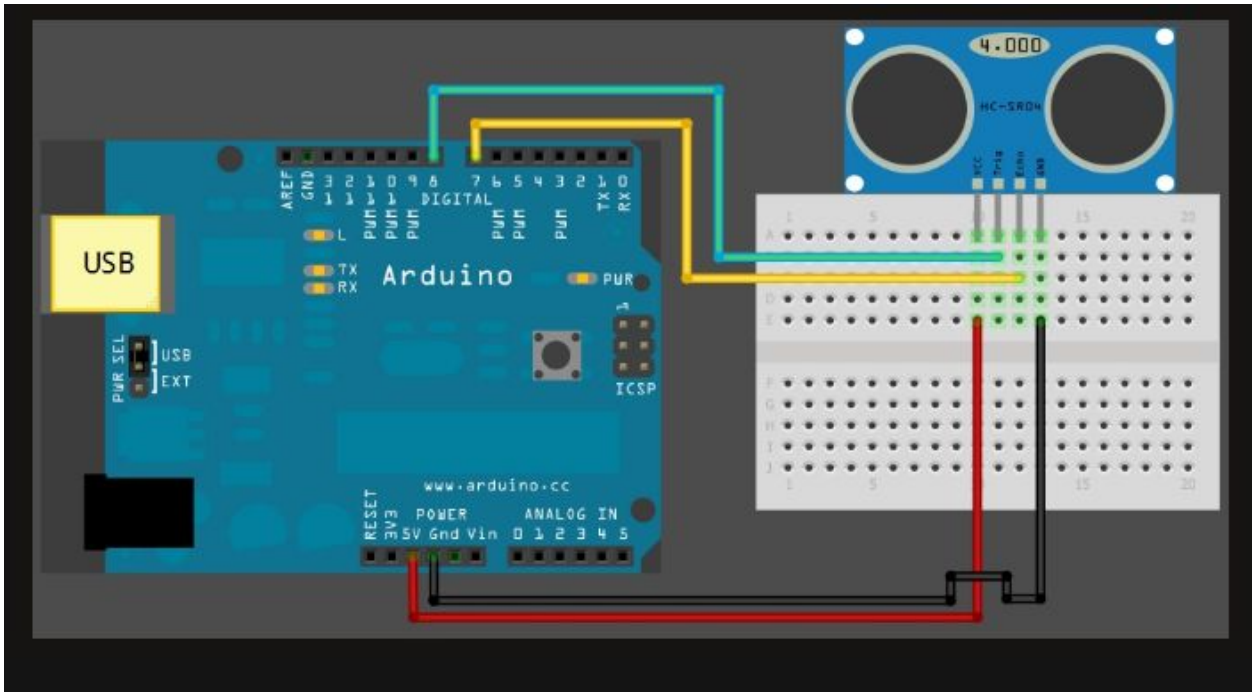
Sensor 2



Ultrasonic Module Distance Measuring Transducer

6.2.2 PROCEDURE

- Connect the ultrasonic sensor on the breadboard so that the pins are lined up vertically from 10 to 13.
- Connect a wire from the VCC pin to the 5V in the Arduino Uno board.
- Connect the GND pin to the GND port in the board.
- Connect the Trig to Arduino digital pin 7 and Echo pin to Arduino digital pin 8.
- Connect the Arduino Uno board to the laptop, which has the Arduino software installed in it and press the master reset button on the board.
- Compile and upload the code and upload it to the port. Press Ctrl + Shift + m.
- Move an object in front of the sensor and record the time taken for the program to return the distance and the accuracy of the distance.



- Program code used for Ultrasonic Module HC-SR04

```
#define echoPin 7 // Echo Pin

#define trigPin 8 // Trigger Pin

#define LEDPin 13 // Onboard LED

int maximumRange = 200; // Maximum range needed

int minimumRange = 0; // Minimum range needed

long duration, distance; // Duration used to calculate distance

void setup() {

 Serial.begin (9600);
```

```
 pinMode(trigPin, OUTPUT);

 pinMode(echoPin, INPUT);

 pinMode(LEDPin, OUTPUT); // Use LED indicator (if required)

}

void loop() {

/* The following trigPin/echoPin cycle is used to determine the

 distance of the nearest object by bouncing soundwaves off of it. */

 digitalWrite(trigPin, LOW);

 delayMicroseconds(2);

 digitalWrite(trigPin, HIGH);

 delayMicroseconds(10);

 digitalWrite(trigPin, LOW);

 duration = pulseIn(echoPin, HIGH);

 //Calculate the distance (in cm) based on the speed of sound.

 distance = duration/58.2;

 if (distance >= maximumRange || distance <= minimumRange){

 /* Send a negative number to computer and Turn LED ON
```

```
 to indicate "out of range" */
 Serial.println("-1");
 digitalWrite(LEDPin, HIGH);
 }
 else {
 /* Send the distance to the computer using Serial protocol, and
 turn LED OFF to indicate successful reading. */
 Serial.println(distance);
 digitalWrite(LEDPin, LOW);
 }
  //Delay 50ms before next reading.
 delay(50);
}
```

6.2.3 OBSERVATIONS

The time taken for the sensors to return the data, the accuracy of the sensors and behavior with different objects of different shape and size was noted down. The data was analyzed and the following table was prepared, which compares the two sensors on various criteria.

Criteria	Ultrasonic Module Distance Measuring Transducer Sensor Perfect Waterproof	New Ultrasonic Module HC-SR04 Distance Transducer Sensor For Arduino Robot
Operating voltage	DC 5V	DC 5V
Acoustic emission frequency	40khz	40khz
Farthest distance	4.5m	5 m
Resolution (precision)	about 0.5cm	Up to 0.3 cm
Angle	less than 50 degrees	Less than 15 degrees
Size	4 cm * 4 cm	3 cm * 1.5 cm

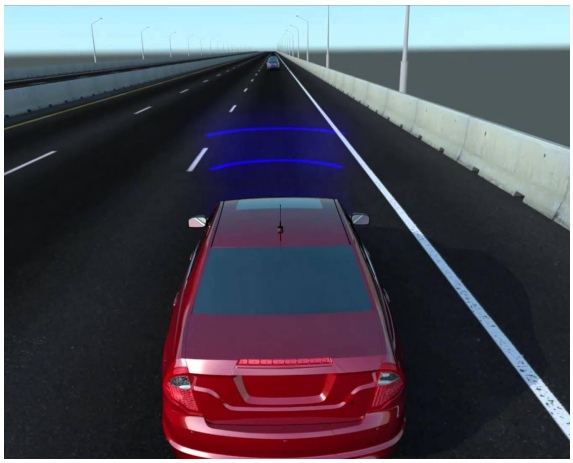
6.2.4. RESULTS

The New Ultrasonic Module HC-SR04 Distance Transducer Sensor for Arduino Robot has better efficiency due to its higher distance measurement capacity and its precision up to 0.3 cm. The size of this sensor is smaller than the other one, thus it is more convenient for our project as compared to the Ultrasonic Module Distance Measuring Transducer Sensor Perfect Waterproof.

7. OUR STEP AHEAD

7.1 A GRAPHIC DISPLAY OF THE CARS ON THE ROAD

Our device will be switched on as soon as the detector senses low visibility. The readings accepted from the ultrasonic transducer will be used to calculate the speed of the object in front of the car. A graphical view of the car and the other vehicles on the road will be displayed on the screen installed inside the car. Since there will be four sensors on the car's windshield and a rear-view mirror the display will show a 360 degree view of the surroundings of the car. The driver can see this graphic display and drive safely.



7.2 CONTROLLING THE CAR'S SPEED DURING PERIODS OF LOW VISIBILITY

A large number of accidents that occur during periods of low visibility are due to over speeding, especially on expressways. The driver assumes that the driveway is empty and goes on increasing his speed, until he crashes into something. Although the road may be empty, over speeding can be risky as the driver can lose control of the car. Our solution to this problem is to install a system, which on detecting the presence of fog or sandstorms or any such hazard, will not allow the car to drive above a certain speed limit. The speed of a car can be maintained by controlling the fuel- air mixture, which can control the force provided to the piston in the engine of the car. The speed limit can be changed according to the type of the road that car is travelling on. The location of the car can be monitored through a G.P.S. This additional feature will further prevent accidents on the road.

8. CONCLUSION

In this report we have discussed the various reasons for creating our project. The visibility changes that occur during fog and sandstorms were determined. The use of ultrasonic waves over for sound ranging to measure the distance between a car and object has also been reasoned. The efficiency of different ultrasonic transducers was analyzed and the most suitable one was chosen for our project. With the help of the experiments conducted, we have finally created a prototype for our project. Our device, Crystal Clear, will prevent accidents during times of low visibility. A detector installed in the car will determine the visibility and will trigger our device to start operating as soon as the visibility drops to less than 2km. Ultrasonic sound waves will be emitted and received on reflection from an obstacle by the transducer. The transducers will be placed on the rear view mirror and the car's windshield. The data received from the transducers will be used to create a graphic display of the vehicles and stationary objects around the car. The driver can view this display on his car screen and drive safely. We hope that our project will aid in preventing accidents in the U.A.E. during times of low visibility.

9. ACKNOWLEDGEMENTS

We would like to take this opportunity to thank our supervisor, Mrs. Sheeba Nair for guiding us through our project. We would also like to thank Mr. Ritesh Dhanak and his IT team for providing us with some of the Arduino equipment. And finally we would also like to thank our computer teacher Mrs. Swarna for advising us on which programming language to use. We also like to thank Mr. Naresh, an automobile engineer, for providing us with information regarding the mechanics of a car. We appreciate the RTA and the Dubai Police for providing us information regarding the road accidents.

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11. APPENDIX

PROBLEM

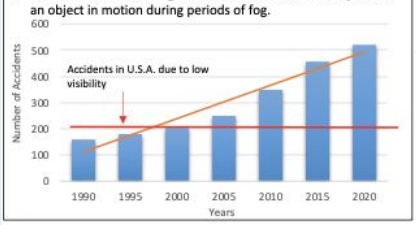
- U.A.E. has a very high death rate of 32 deaths per 100,000 in comparison with U.K.'s 4 deaths per 100,000.
- The graph below shows the cause of these unnatural deaths. Road traffic injury causes 63% of the deaths.
- One of the main reasons for these road accidents is low visibility during fog, sand storms, etc.

DEATH DUE TO INJURIES IN THE U.A.E

ACCIDENTS DUE TO LOW VISIBILITY

Road accidents occur during low visibility due to these reasons :

- Fog can reduce the visibility to less than 1 km by lowering contrast substantially, thereby causing objects to become fainter and less distinct. Furthermore, due to scattering of light the driver's vision is blurred.
- Due to lowered contrast, judgement of speed is affected and it becomes difficult for a driver to estimate his own speed and might drive at very high speeds and loose his control.
- The driver cannot distinguish between a motionless object and an object in motion during periods of fog.



CRYSTAL CLEAR

OUR SOLUTION

We have created a system that aims to prevent accidents during low visibility. After having analyzed the reasons of these accidents, crystal clear tries clear them in the following ways :

- Our System uses ultrasonic transducers on all four sides of the car to calculate the distance between the car and other obstacles surrounding it. This data is integrated into a graphical view that is displayed on the multimedia screen in the car.

- The speed control system prevents the car from exceeding a certain speed during times of low visibility. Since this system is installed in the engine, the driver will have to follow it.
- The ultrasonic transducers, while calculating the distance of the obstacles around the car will estimate the speed of the obstacles and they will be represented accordingly on the screen.

Since our device solves the problems that occur during low visibility, it will help in preventing a lot of accidents.

HOW IS IT EFFECTIVE IN THE UAE

- The U.A.E. is accustomed to sand storms and dust storms through out the year and heavy fog during the winters. During these weather conditions the visibility decreases immensely.
- A huge number of road accidents occur during these periods. Since our device prevents these accidents, it will be well suited for the U.A.E., where these conditions are frequent.

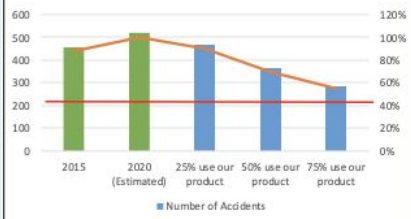
COST EFFECTIVE AND ENVIRONMENT FRIENDLY

- Our prototype including a low visibility sensor and ultrasonic transducers costs 50 AED.
- We approximate that the cost of our actual device would be 1500 AED. On mass production of the product, we estimate that this price should come down by a large margin. This in comparison with the price of a car is very less.
- Ultrasonic waves which are a primary use in our device cause no substantial damage to the environment. This makes our device very eco friendly and effective.

CONCLUSION

- Through our project, we aspire to reduce the number of deaths and injuries that occur especially in the UAE.
- The graph below demonstrates the reduction in the number of accidents that our project's implementation will bring about. Estimations are based on the fact that our product solves most issues related to driving during periods of low visibility.

REDUCTION IN NUMBER OF ACCIDENTS

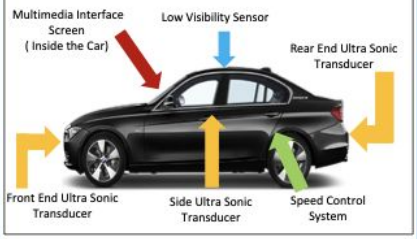


- Therefore we believe that if our product is used to the maximum, the number of accidents can be reduced by 50%. This would make UAE's roads much safer by the year 2020.

COMPONENTS OF THE DEVICE

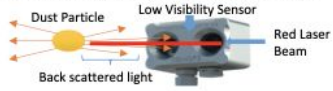
The device consists of four main components :

- Low Visibility Sensor
- Ultra Sonic Transducers
- Multimedia Interface Screen
- Speed Control System



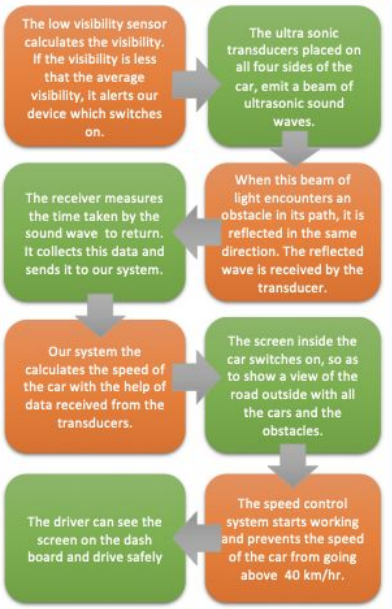
LOW VISIBILITY SENSOR

- The low visibility sensor will detect occurrences of low visibility and send signals to our device.
- A narrow beam of red laser light will be emitted from the sensor, which will be scattered by obstacles like fog particles or water droplets in a 30 cm radius in front of the sensor.



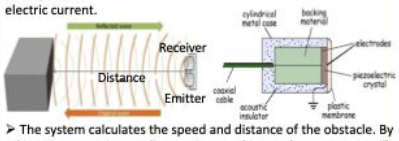
- A detector, placed just behind the lens of the sensor, detects this back scattered light and sends appropriate signals to our system.
- When our system receives these signals it will be switched on.

WORKING OF OUR DEVICE



ULTRASONIC TRANSDUCERS

- Ultrasonic transducers consist of an ultrasonic sound emitter and a receiver which are placed very close to each other. Our project uses 4 ultrasonic transducers. The first will be placed above the bumper of the car, one on the back and two on either side of the car.
- Ultrasonic sound waves are emitted by the transducers. When this wave encounters an obstacle, it will be reflected along the same path. The receiver will absorb this wave and convert it into electric current.



- The system calculates the speed and distance of the obstacle. By taking 5 consecutive readings at 5 second intervals our system will calculate the speed of the obstacle.
- The multimedia interface screen on the dash board will switch on and display a 360 degree view of the cars surrounding your car. The driver can view this image and navigate his way safely on the road in situations of low visibility.

SPEED CONTROL SYSTEM

- As soon as the low visibility sensor detects very low visibility, the speed control system will start working.
- Most cars have an upper limit for speed that they can't exceed. This is controlled by the Governor which is present in the car's Electronic Control Unit.
- The governor limits the amount of the fuel input to the engine, which reduces the force during the power stroke, thereby preventing the car from going above a certain speed.
- Our system will program the governor to prevent the car from going above a certain speed during times of low visibility.
- This will provide more safety to driver. There will also be a manual switch to start or stop the Speed Control System in case of an emergency.

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