# DISTANCE MEASUREMENT USING MOBILE APPLICATION

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## ABSTRACT

*This paper describes an ultrasonic sensor that is able to measure the distance from the ground of selected points of a motor vehicle. The sensor is based on the measurement of the time of flight of an ultrasonic pulse, which is reflected by the ground. A constrained optimization technique is employed to obtain reflected pulses that are easily detectable by means of a threshold comparator. Such a technique, which takes the frequency response of the ultrasonic transducers into account, allows a sub-wavelength detection to be obtained.*
*Experimental tests, performed with a 40 kHz piezoelectric-transducer based sensor, showed a standard uncertainty of 1 mm at rest or at low speeds; the sensor still works at speeds of up to 30 m/s, although at higher uncertainty. The sensor is composed of only low cost components, thus being apt for first car equipment in many cases, and is able to self-adapt to different conditions in order to give the best results*

**Keyword :** Firebase, Nodemcu  ,*soldering ,android application, and lora module*

## 1.  INTRODUCTION:

A Laser Distance Meter sends a pulse of laser light to the target and measures the time it takes for the reflection to return. For distances up to 30m, the accuracy is É3mm. On-board processing allows the device to add, subtract, calculate areas and volumes and to triangulate. You can measure distances at a distance.A Laser Distance Meter* sends out a finely focussed pulse of light to the target and detects the reflection. The meter measures the time between those two events, and converts this to a distance. The formula is simple: Distance = Ä (Speed x Time). However the speed of light is 300,000 km per second, so to resolve differences of (say) 1 cm, the meter mumeasurtime intervals of the order of billionths of a second. But don't worry – the technology is well established and reliable! A laser distance meter can measure distances of up to 30m with an accuracy of É3mm. An Ultrasonic Distance Meter works on a similar principle, but instead of light it uses sound with a pitch too high for the human ear to hear. The speed of sound is only about ⅓ of a km per second, so the time measurement is easier, but there are other issues, as we shall see below. * Note that we are not looking at laser 'range finders' – these are much less accurate, and are typically used in golf, hunting and forestry.

### 1.1 ARDUINO UNO:
 . If you want to program your Arduino Uno while offline you need to install the Arduino Desktop IDE The Uno is programmed using the Arduino Software (IDE), our Integrated Development Environment common to all our

boards. Before you can move on, you must have installed the Arduino Software (IDE) on your PC, as explained in the home page of our Getting Started.

**1.2 LORA MODULE:**
Semtech's LoRa transceivers feature a long-range wireless modem that    provides ultra-long range spread spectrum communication and high interference immunity while minimizing current consumption.
 Our patented modulation technique allows transceivers within this product family to achieve sensitivities of -137dBm and -148dBm respectively. LoRa technology provides significant advantages in both blocking and selectivity over conventional modulation techniques, solving the traditional design compromise between range, interference immunity and energy consumption

## 2.   FIREBASE:

  Firebase evolved from Envolve, a prior startup founded by James Tamplin and Andrew Lee in 2011. Envolve provided developers an API that enables the integration of online chat functionality into their websites. After releasing the chat service, Tamplin and Lee found that it was being used to pass application data that were not chat messages
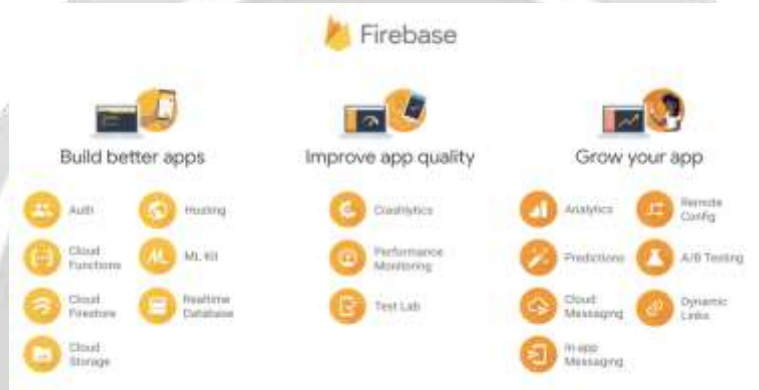


The Assistant tool window in Android Studio. Firebase is a mobile platform that helps you quickly develop high-quality apps, grow your user base, and earn more money

### 2.1 B**READBOARD CONNECTION:**
         The Functions of a Breadboard. A breadboard is a platform you can use to build and test electronic circuits, usually without having to do any soldering. Certain parts of the breadboard are wired together so that electricity can flow from component to component in orderly rows. get it running easily and quickly. It also helps when someone else needs to understand and inspect the circuit. ... Color coding the jumper wires can help reduce confusion when building a circuit. . This is what the clips look like when they are removed from a breadboard. When you press a component's lead into a breadboard hole
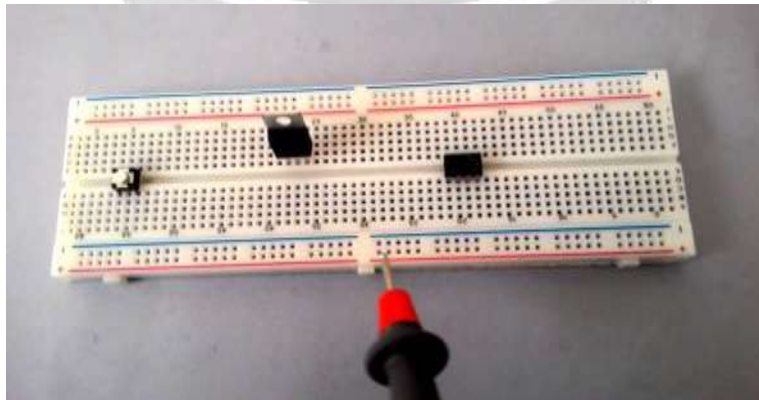
### 2.2 ANDROID APPLICATION:

An Android app is a software application running on the Android platform. Because the Android platform is built for mobile devices, a typical Android app is designed for a smartph Android initially came into existence with the sure fire idea that developments are given the power and freedom to create enthralling Mobile applications while taking advantage of everything that the mobile handset has to offer Google's mobile operating device, the android is its awesome creation in the definitive creation of Software Applications for the mobile phone arena it also facilitates the g-juice in your mobile thus initiating a whole new world of Mobile Technology experience by its customers.

We at Arokia IT are technically equipped to initiate any level of these amazing software applications using the android genius from Google. Around in the year 2007, Google announced its Android Operating System and Open Handset Alliance with these two major contributions to the mobile industry that ultimately changed our experience with mobile interface

### 2.3 ARDUINO CODE

Arduino is an open-source prototyping platform used for building electronics projects. It consists of both a physical programmable circuit board and a software, or IDE (Integrated Development Environment) that runs on your computer, where you can write and upload the computer code to the physical board

In 2005, building upon the work of Hernando Barragán (creator of Wiring), Massimo Banzi and David Cuartielles created Arduino, an easy-to-use programmable device for interactive art design projects, at the Interaction Design Institute Ivrea in Ivrea, Italy.

```
// defining the trigger and echo pins of the ultrasonic sensor
const int trigger = 9;
const int echo = 10;

// defining variables
long duration;
int distance;

void setup() {

    // Sets the trigger pin as an OUTPUT
    pinMode(trigger, OUTPUT);

    // Sets the echo pin as an INPUT
    pinMode(echo, INPUT);

    // Begins the serial communication
    Serial.begin(9600);
}

void loop() {

    // Clears the trigger pin
    digitalWrite(trigger, LOW);

    delayMicroseconds(2);
    // Sets the trigPin on HIGH state for 10 micro seconds
    digitalWrite(trigger, HIGH);
    delayMicroseconds(10);
```

### 3.    EXPERIMENTAL RESULTS:

Laboratory Tests The sensor has been initially calibrated and tested in laboratory for distances in the range of 0.1–0.6 m and for temperaturesin the range of 0–40C. The experimental standard deviation of the linearity with respect to the distance has been found to be of 0.3 mm (see Fig. 3), while the temperature effect produces a standard deviation of less than 0.2 mm as expected.The air turbulence effect has been investigated for speeds ofup to 10 m/s by moving the air with a variable-speed fan; the noise measurement system and the signal auto-change facility have been tested by artificially generating an ultrasonic noise with anadditional piezoelectric transducer. Theoverallstandard uncertainty, when the distance is measured from a flat surface Fig. 5. Sensor arrangement on the car that has been used for the tests. In the absence of acoustic noise, for temperaturesin the range of 0–40 C and distances in the range of 0.1–0.6 m, is better than 1 mmTests have beenper formed at different speeds on asphalt and rough ground.The four potentiometer outputs have been used to compute a distance reference value to be compared with the ultrasonic measured distance. The end spring heights, which have been estimated by adding the tire deformations to the spring heights measured by the potentiometers, have been used to identify the

plane of the vehicle body. The distance reference value that corresponds to the distance the ultrasonic sensor should produce has been determined by putting the measuring head coordinatesThe technique is to develop a device that can be used to measure the distance of the target with high precision .Focus is given on lower range. Focus has been given on lower ranges considering the range of 2cm to 4m with the precision of ±0.3cm
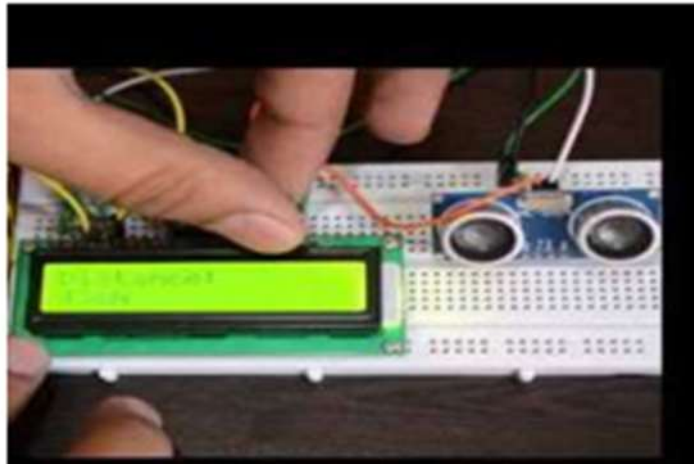


### 3.1 ULTRASONICSENSOR:

An ultrasonic sensor is an electronic device that measures the distance of a target object by emitting ultrasonic sound waves, and converts the reflected sound into an electrical signal. Ultrasonic waves travel faster than the speed of audible sound (i.e. the sound that humans can hear). Ultrasonic sensors have two main components: the transmitter (which emits the sound using piezoelectric crystals) and the receiver (which encounters the sound after it has travelled to and from the target In order to calculate the distance between the sensor and the object, the sensor measures the time it takes between the emission of the sound by the transmitter to its contact with the receiver

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## 4. CONCLUSIONS :

 Finding distance measurement using mobile application is the instance process that will so useful for detecting obstacles and also for an blind peoples and this is mainly processed by lidar lite v4 sensor that generating ultra sonic waves Which will get reflect back and get noted on the mobile application  instantly and with audio  facility for deaf and dumb peoples around the world .In this there is a vibrator  which will sense a ultrasonic radiation in the sensor and  it will vibrete fastly depending on the distance from the obstacle  From the user so they can  easily sense through it

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