

Ultrasonic Distance sensor

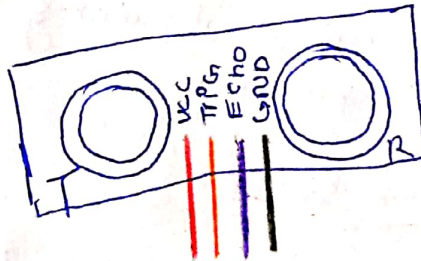
→ An ultrasonic sensor is an instrument that measures the distance to an object using ultrasonic sound waves.

→ An ultrasonic sensor uses a transducer to send & receive ultrasonic pulses that relay back information about an object's proximity.

Working

- ultrasonic sensors work by emitting sound waves at a frequency too high for humans to hear.
- they then wait for the sound to be reflected back, calculating distance based on the time required.

HC-SR04 ultrasonic sensor pinout diagram



PINOUT CONFIGURATION

<u>PIN NUMBER</u>	<u>PIN NAME</u>
1	VCC
2	TRIG
3	ECHO

DESCRIPTION

The VCC pin powers the sensor, typically with +5V. Trigger pin is an input pin. this pin has to be kept high for 10µs to initialize measurement by sending US wave.

Echo pin is an output pin. this pin goes high for a period of time.

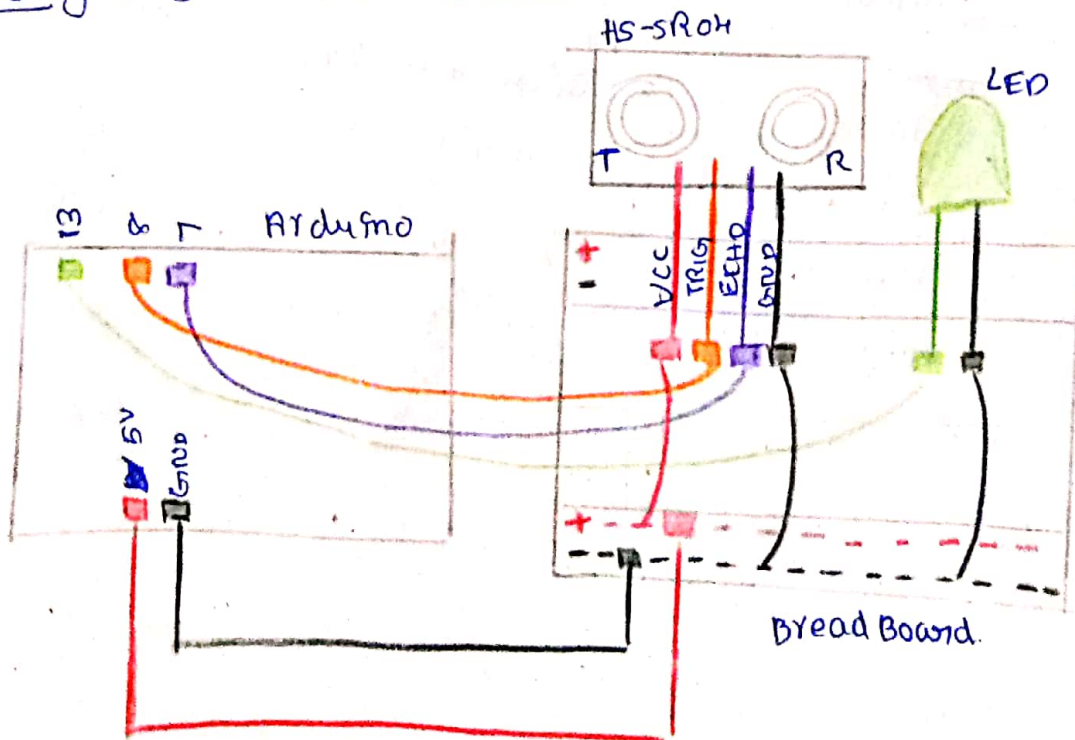
4 Ground

which will be equal to the time taken for the OS wave to return back to the sensor. This pin is connected to the ground of the system.

Applications of ultrasonic ~~son~~ distance sensor

- + used to detect & avoid obstacles with robots like biped robot, obstacle avoidance robot, path finding robot etc.
- + used to measure the distance within wide range of 2cm to 400cm.
- + can be used to detect objects submerged by sensor by rotating it.
- + Depth of wells, pits can be measured since the waves can penetrate through water.

Fitting program of a program



code.

const int trigpin = 8;

const int echopin = 9;

long duration;

int distance;

void setup ()

{ pinMode (trigpin, OUTPUT);

pinMode (echopin, INPUT);

pinMode (13, OUTPUT);

Serial.begin (9600);

}

void loop ()

{

digitalWrite (trigpin, HIGH);

delayMicroseconds (10);

digitalWrite (trigpin, LOW);

duration = pulseIn (echopin, HIGH);

~~time~~ = duration * 0.034 / 2;

Serial.println (distance);

if (distance <= 5)

digitalWrite (13, HIGH);

else digitalWrite (13, LOW);

}