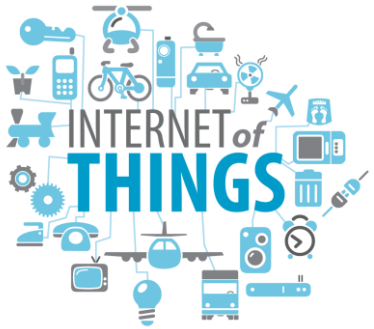
UNIVERSITY OF SCIENCE - VNUHCM
Faculty of Information Technology

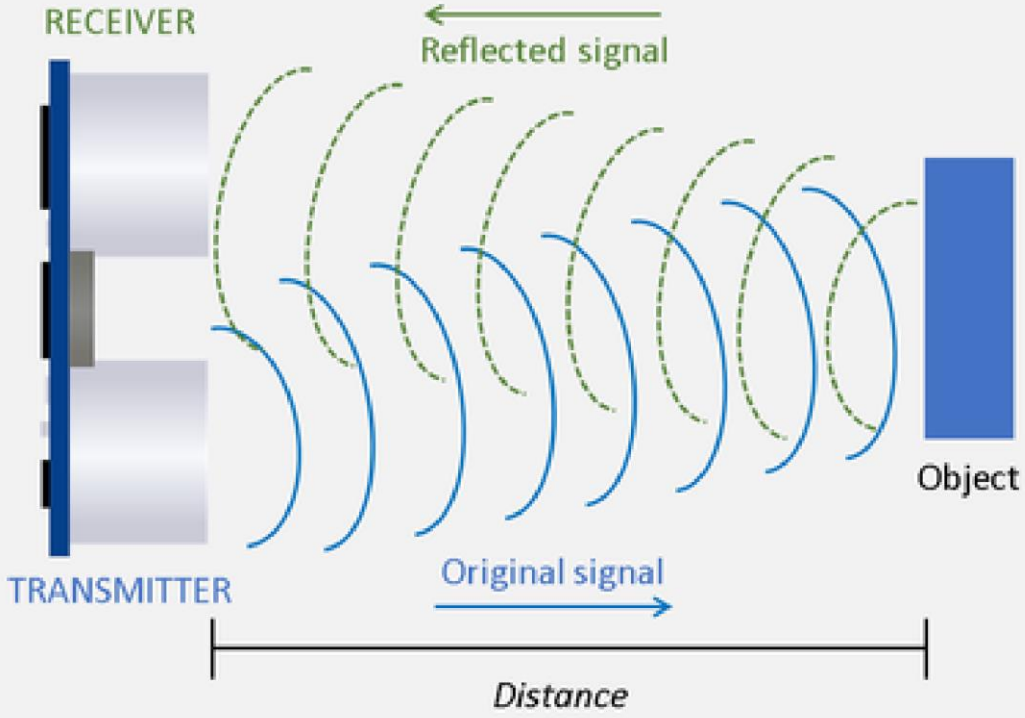
# INTERNET OF THINGS

# 1.6

# ULTRASONIC SENSOR



# Ultrasonic Sensor HC-SR04

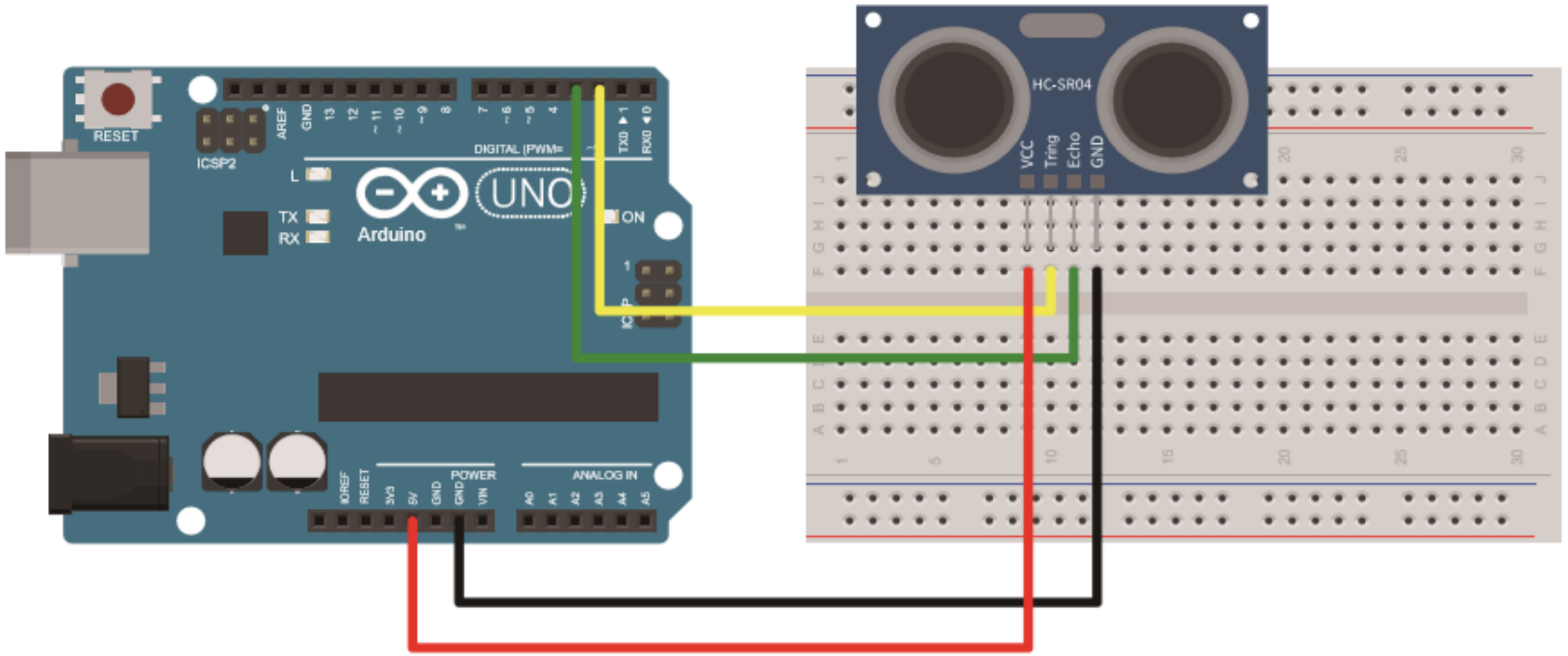

Sound speed: 340 m/s = ? cm / microsecond

# How does it works?

# Sound speed

The speed of sound transmits in the air:

340 m/s = 0.034 cm / microsecond




| Ultrasonic | Arduino |
|---|---|
| VCC | 5v |
| GND | GND |
| Trig | 2 |
| Echo | 3 |

```
int trig_pin = 2;
int echo_pin = 3;

long getDistance() {
  digitalWrite(trig_pin, LOW);
  delayMicroseconds(2);
  digitalWrite(trig_pin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trig_pin, LOW);

  long duration = pulseIn(echo_pin, HIGH);

  long distanceCm = duration * 0.034 / 2;

  return distanceCm;
}
```

```
void setup() {
  Serial.begin(9600);

  pinMode(trig_pin, OUTPUT);
  pinMode(echo_pin, INPUT);
}

void loop() {
  int distanceCm = getDistance();
  Serial.println(distanceCm);
}
```

# Parking System

Your car is backing back to the parking slot. If the rear of car is 100cm or more from the wall, the beep sound will be slow. Otherwise, the closer the car is to the wall, the faster the beep sound will come.