

Manhole Detector

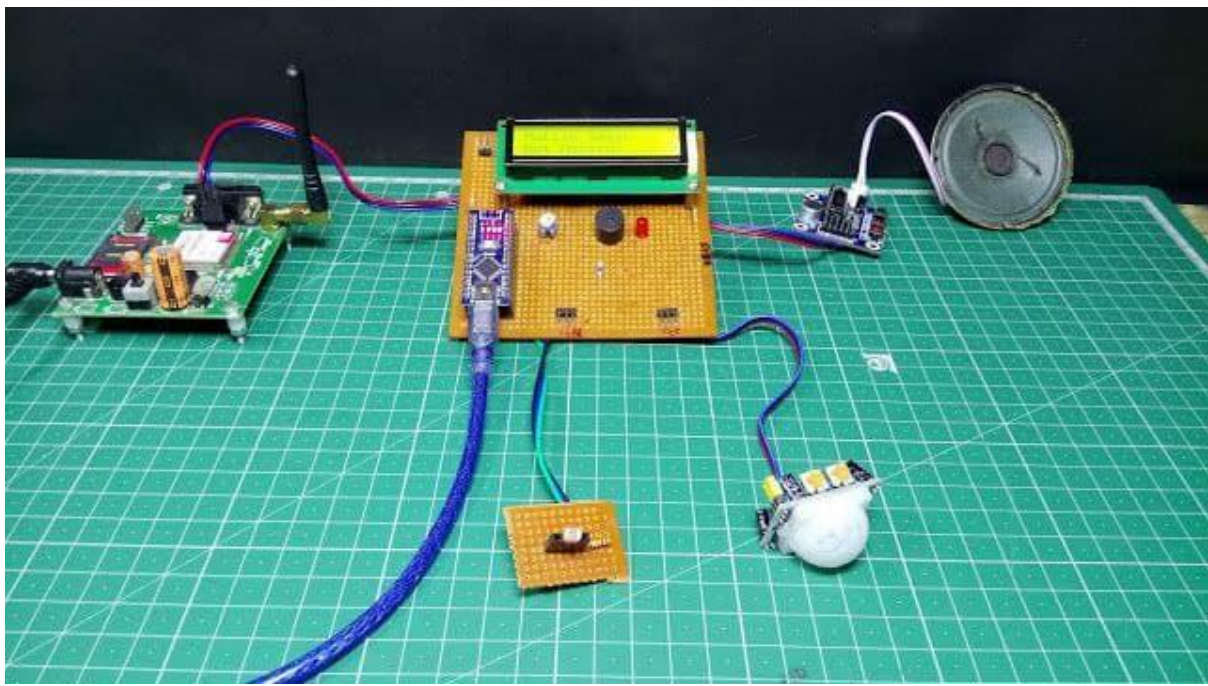
Team Members:

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Short Description:

It is a device to sense the people ,vehicles and make them aware that the manholes are opened and helps to avoid the “Unexpected accidents”.

Cover Image:



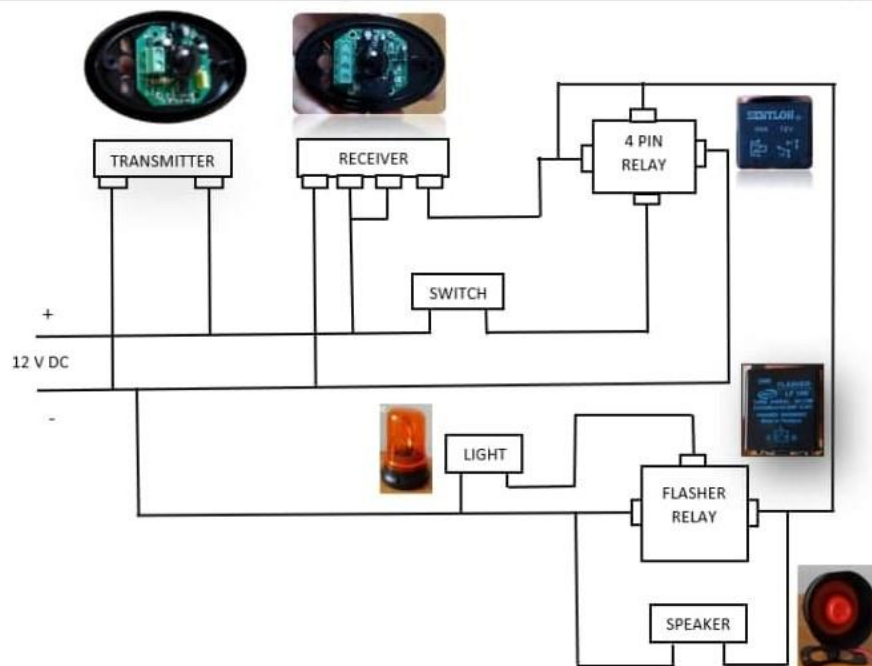
Platform:

Raspberry-pi4, Arduino, Python, SSD

Components Used:

1. Arduino uno
2. Raindrop Sensor
3. Speaker or Buzzer
4. Infrared beam sensor
5. Flasher Relay
6. 4 pin Relay
7. Switch
8. LED
9. Connecting wires

Block Diagram:



Description:

Manhole Detector is a device which helps the people to avoid "Unexpected accidents that happens on Manhole" (ie) The people who accidentally fall on Manholes without knowing whether it is opened or closed. People who fall on the Manhole suffers from asphyxiation and delirium .

Excess inhalation of hydrogen sulphide gas is harm to health people even die on falling into the manhole. Some device will measure the toxicity, water level present in the manhole. But no device is present to warn the people for this kind of problem. Hence our device will be the best solution.

Working:

- ✓ In our device initially camera is ON and speaker is OFF.
- ✓ Infrared beam sensor and Raindrop Sensor are already placed inside the hole both the sensors are connected to arduino
- ✓ Camera and speaker is connected to raspberry-pi.
- ✓ If the manhole cover is open it detects whether the person comes near to the manhole or not by using camera.
- ✓ If the person comes near to the manhole it rings the alarm and gives the red signal.
- ✓ Suppose if the manhole lid is broken it'll fall down inside the hole which disturbs the Infrared beam sensor so it activates our device.
- ✓ It stops ringing the alarm if no person comes near to it or if the manhole is closed.
- ✓ In special case when the camera is disturbed by external factors like rain, Raindrop sensor role comes into play.

- ✓ So our device works with both Hardware as well as Software based manner which will be very useful

Sample Program:

```
// Rain Detection Module

int rainsense= A0; // analog sensor input pin 0

int buzzerout= 10; // digital output pin 10 - buzzer output

int countval= 0; // counter value starting from 0 and goes up by 1 every
second

int ledout= 11; // digital output pin 11 - led output


void setup(){

    Serial.begin(9600);

    pinMode(buzzerout, OUTPUT);

    pinMode(ledout, OUTPUT);

    pinMode(rainsense, INPUT);

}

void loop(){

    int rainSenseReading = analogRead(rainsense);

    Serial.println(rainSenseReading); // serial monitoring message

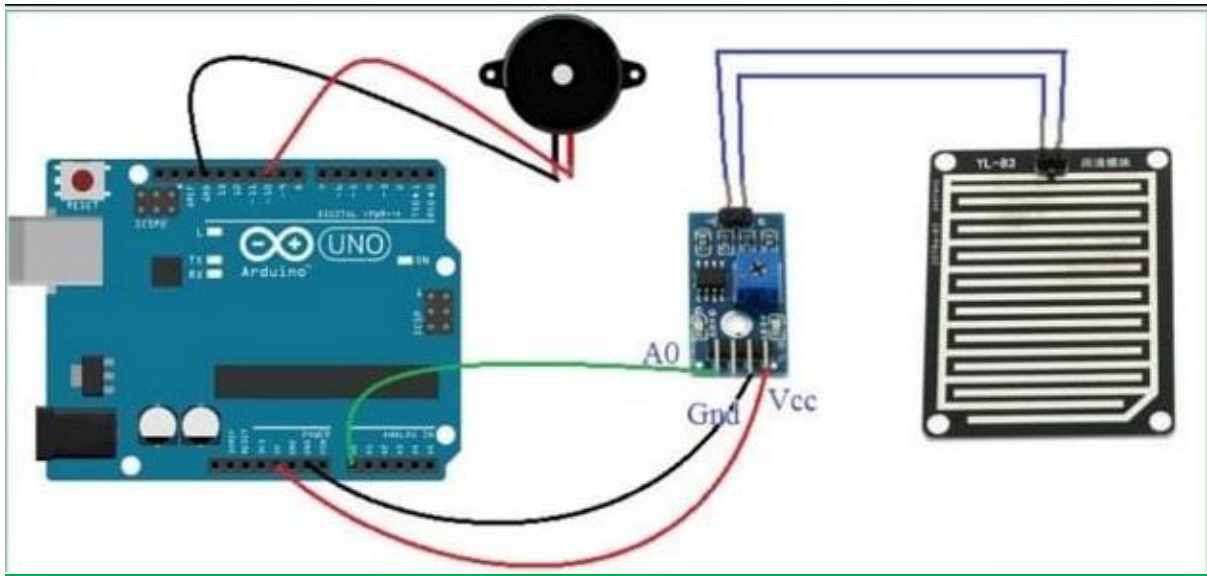
    delay(250); // rain sensing value from 0 to 1023.

    // from heavy rain - no rain.

    if (countval >= 35){
```

```
Serial.print("Heavy rain");  
  
digitalWrite(buzzerout, HIGH); //raise an alert after x time  
  
digitalWrite(ledout, HIGH); // led glow  
  
}  
  
//raining for long duration rise buzzer sound  
  
// there is no rain then reset the counter value  
if (rainSenseReading <500){  
    countval++; // increment count value  
}  
  
else if (rainSenseReading >500) { // if not raining  
    digitalWrite(buzzerout, LOW); // turn off buzzer  
    digitalWrite(ledout, LOW); // turn off led  
    countval = 0; // reset count to 0  
}  
  
delay(1000);  
}
```

Connection Diagram:



Advantages:

- ✓ It helps to save people's life from unexpected accidents
- ✓ Not only humans even automobiles can be prevented from accidents.

Further Improvement:

- In future we'll also implement this same idea to avoid accidents in deep well.
- When our device find that manholes are opened then it'll intimate directly corporation office with location.

Overview of our project:



Conclusion:

Manhole detector plays a vital role in everyday's life. In India more accidents are happening due to manholes it affects not only Human beings but also animals as well as automobiles also. So our device will be the best solution to avoid these kind of accidents. In simple words to say "When Manhole Detector is used in Smart city that city becomes much more Smarter".