A
PROJECT REPORT
ON

SMART SURVEILLANCE SYSTEM

USING ARDUINO

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Introduction:

In today's rapidly evolving technological landscape, the need for enhanced security and surveillance solutions has become increasingly critical. Traditional security systems often lack the flexibility, affordability, and advanced features that modern users demand. As a result, there is a growing interest in developing smart surveillance systems that leverage accessible technologies to provide effective monitoring and protection for homes and businesses.

Aim :

To develop a smart surveillance system using Arduino that integrates various sensors and modules to monitor and secure an area in real-time, providing alerts and visual feedback to enhance safety and security.

Objectives:

- real time monitoring
- intruder detection and alerting
- remote access and control
- modular and scalable design

Components:

Arduino Board:

- The Arduino board serves as the central microcontroller for the smart surveillance system. It processes inputs from various sensors and controls the outputs, such as sending alerts and activating LEDs. The Arduino platform is user-friendly and highly versatile, making it an ideal choice for both beginners and experienced developers. Commonly used boards for this project include the Arduino Uno or Arduino Nano.

GSM Module (e.g., SIM800L):

- The GSM module allows the surveillance system to send real-time SMS alerts to the user’s mobile phone. When the system detects motion or unauthorized access, the GSM module communicates with the mobile network to deliver

notifications. This feature ensures that users can receive immediate updates, enhancing the overall security of the monitored area.

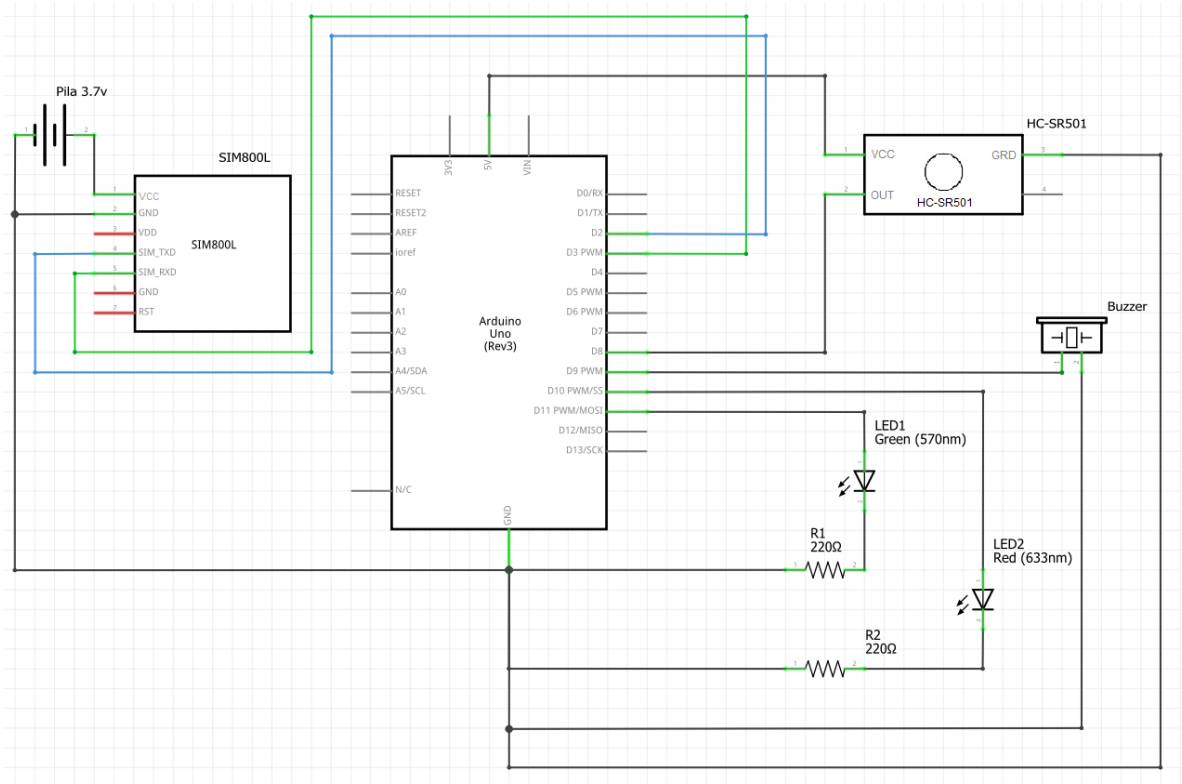
Ultrasonic Sensor (e.g., HC-SR04):

- The ultrasonic sensor is used to detect the presence of objects or movement within a specified range. It emits ultrasonic waves and measures the time taken for the waves to bounce back after hitting an object. This data allows the system to determine if someone has entered the monitored area. The ultrasonic sensor is essential for triggering alerts when an intruder is detected.

LEDs (Light Emitting Diodes):

- LEDs are used in the system to provide visual feedback about its status. For example, a red LED can indicate that the alarm is activated (intruder detected), while a green LED can signify that the system is in a safe state. These visual indicators help users quickly assess the system's status without needing to access the mobile app or web interface.

CIRCUIT DIAGRAM :



Program:

```
#include <SoftwareSerial.h>

SoftwareSerial mySerial(9, 10); // RX, TX

const int trigPin = 11;

const int echoPin = 12;

const int redLedPin = 4;

const int greenLedPin = 13;


int smsCount = 0;

bool isActivated = false;


void setup() {

    pinMode(trigPin, OUTPUT);

    pinMode(echoPin, INPUT);

    pinMode(redLedPin, OUTPUT);

    pinMode(greenLedPin, OUTPUT);

    mySerial.begin(9600);

    Serial.begin(9600);

}


void loop() {

    if (!isActivated) {

        checkForActivation();

    } else {

        monitorDistance();

    }

}
```

```
void checkForActivation() {
   if (mySerial.available() > 0) {
      char inchar = mySerial.read();
      if (inchar == '%' && mySerial.available() > 0 && mySerial.read() == '@' &&
         mySerial.available() > 0 && mySerial.read() == '$') {
         isActivated = true;
         sendInitialMessage();
      }
   }
}

void sendInitialMessage() {
   sendTextMessage("Burglar alarm system activated !!");
}

void monitorDistance() {
   int distance = getDistance();
   Serial.print("Distance: ");
   Serial.println(distance);

   if (distance < 20) {
      handleIntruder();
   } else {
      resetAlarm();
   }
}
```

```
int getDistance() {
    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);
    long duration = pulseIn(echoPin, HIGH);
    return duration * 0.034 / 2; // Distance in cm
}

void handleIntruder() {
    if (smsCount < 3) {
        sendTextMessage("ALERT !!! Someone entered.");
        smsCount++;
        redLedOn();
        greenLedOff();
    } else {
        Serial.println("Maximum SMS limit reached.");
        redLedOff();
        greenLedOn();
    }
}

void sendTextMessage(const String& message) {
    mySerial.println("AT+CMGF=1"); // Set SMS to text mode
    delay(1000);
    mySerial.println("AT+CMGS=\"+91 7075071942\"\r"); // Replace with your phone number
    delay(1000);
```

```
    mySerial.println(message);
    delay(200);
    mySerial.println((char)26); // End of message character
    delay(1000);
}

void resetAlarm() {
    redLedOff();
    greenLedOn();
}

void redLedOn() {
    digitalWrite(redLedPin, HIGH);
}

void redLedOff() {
    digitalWrite(redLedPin, LOW);
}

void greenLedOn() {
    digitalWrite(greenLedPin, HIGH);
}

void greenLedOff() {
    digitalWrite(greenLedPin, LOW);
}
```

APPLICATIONS:

- Home security
- small business monitering
- Parking Lot surveillance (to avoid vandalism)
- warehouse security
- elderly care
- event security

Conclusion:

In conclusion, the Smart Surveillance System using Arduino addresses the pressing need for effective security measures.By fostering a proactive approach to safety, this project contributes to a more secure environment and encourages innovation in the realm of personal and commercial security solutions.