School Of Computing

Internet Of Things
19CSE446

Bank Security System with Multi-Sensors

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March 2023

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Abstract:

The Automatic Bank Alarm System with Sensor Integration and Wireless Communication aims to enhance security measures in banking environments by incorporating sensors and wireless modules. This project utilizes Light Dependent Resistors (LDR) to detect environmental brightness and Passive Infrared (PIR) sensors to detect motion within the bank premises and door contacts to monitor entry and exit points. The system adjusts alarm sensitivity based on the presence of motion and unauthorized access, effectively deterring potential intruders and enhancing overall security. Additionally, it employs an ESP8266 Wi-Fi module for wireless communication, enabling real-time alerts and remote monitoring of alarm events. The project showcases the feasibility and benefits of integrating smart security systems in banking facilities, ensuring the safety of customers and assets.

Introduction:

The Traditional Bank Security Systems often operate inefficiently, leading to security breaches and inadequate protection measures. The Automatic Bank Alarm System addresses these issues by integrating sensors and wireless communication modules. This report provides a detailed overview of the project's objectives, methodology, components used, and results. The thought of outlining a new framework for bank security that effectively detects and deters unauthorized access while minimizing false alarms. Smart security systems are crucial components of modern banking facilities, ensuring the safety of customers and assets. Just as in the case of smart street lighting systems, efficient energy usage and effective security measures are essential for economic and social well-being.

Project Description:

1.Sensor Integration:

1.1) Light Dependent Resistor (LDR):

- The LDR sensor detects ambient light levels to determine whether alarms should be activated.
- During periods of low light or at night, the LDR triggers the activation of the alarm system to enhance security and deter potential threats.
- Additionally, the LDR sensor assists in fault detection by identifying anomalies in the ambient light conditions, such as sudden changes or prolonged darkness, and communicates these issues to the control room via the wireless module

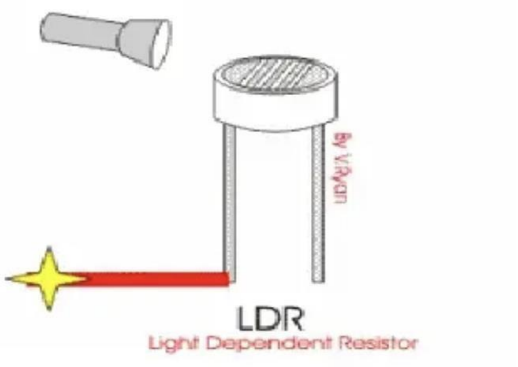


Fig: 1.1 Schematic illustration of the LDR

1.2) Passive Infrared (PIR) Sensor:

- PIR sensors are employed to detect motion within the vicinity of the bank premises.
- Upon detecting motion, the system activates the alarm system to alert security personnel and deter potential intruders.
- Integration with the LDR sensor enables intelligent monitoring, ensuring that the alarm system responds effectively to changes in both ambient light levels and motion detection.

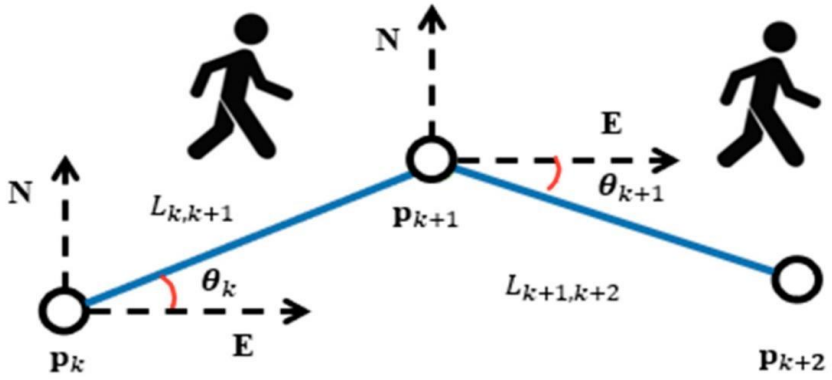


Figure: 1.2 Schematic illustration of the PDR.

1.3) Ultrasonic Sensor:

- Ultrasonic sensors are utilized to detect the presence and movement of individuals within the bank premises.
- These sensors play a crucial role in triggering the alarm system upon detecting unauthorized movement, thereby enhancing security measures.
- Integration with other sensors, such as door contacts and PIR sensors, further enhances the system's ability to detect and respond to potential security threats in real-time.
- Ultrasonic sensors are integral components of modern security systems, providing reliable detection capabilities to ensure the safety of bank personnel and assets.

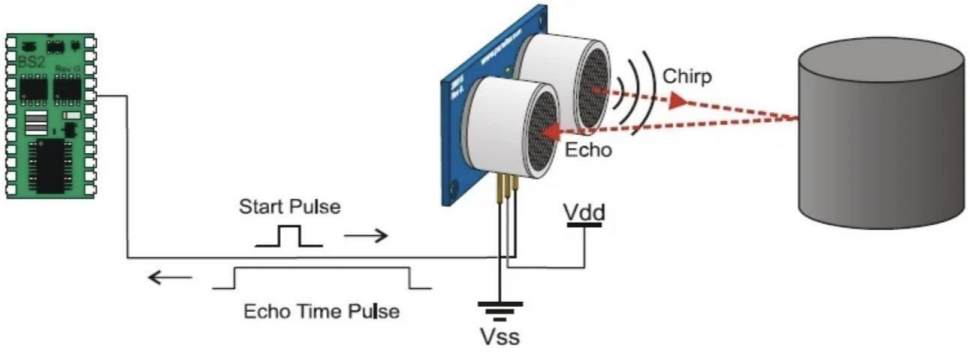


Figure: 1.3 Schematic illustration of the Ultrasonic

3.Wireless Communication:

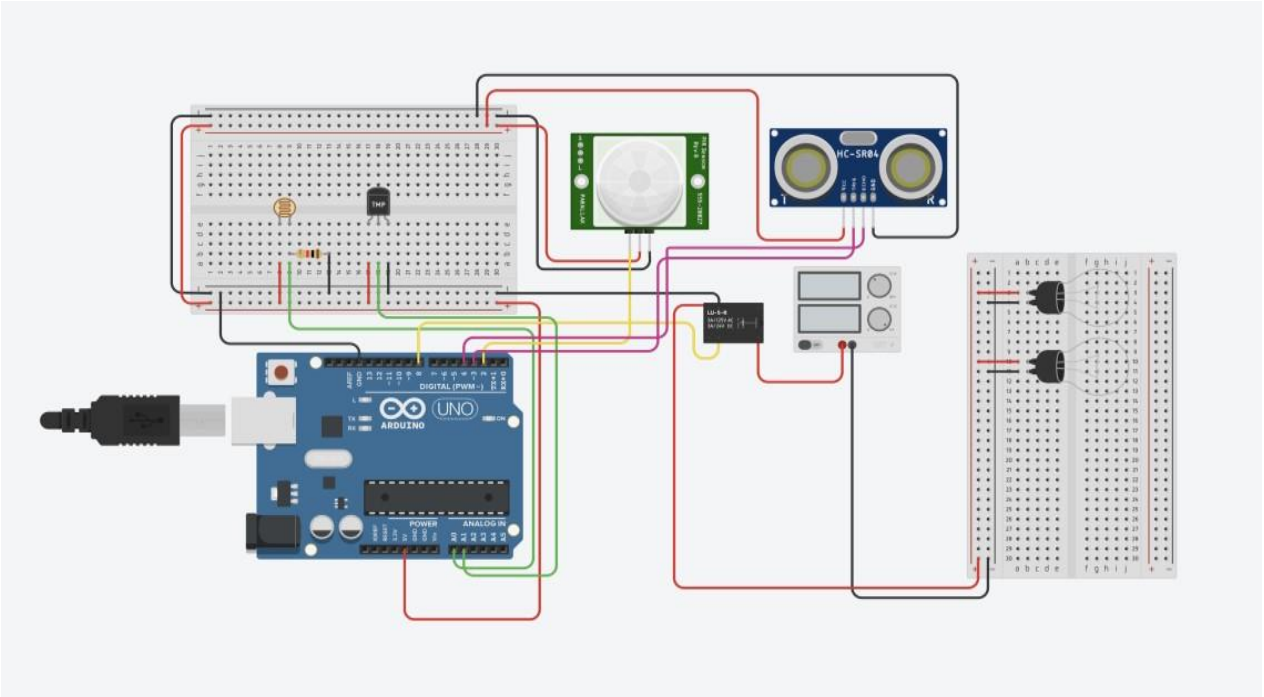
Prior to packets going through rule matching, preprocessors are modules. By managing operations like protocol normalization, stream reassembly, and defragmentation, they make it possible to identify sophisticated attacks with greater accuracy.

- **Logging and Alerting: Snort can log events it detects to output formats, such as databases, text files, and syslog servers.** Additionally, it produces warnings instantly, giving managers advance notice of possible security concerns.

- **Output Plugins**: With the help of these plugins, Snort can be more easily integrated with other systems for additional analysis, reporting, or reaction actions.

For network intrusion detection, Snort provides a strong and adaptable solution that enables enterprises to proactively guard against a variety of cyberthreats, including DDoS attacks.
Snort is a useful tool for preserving the security and integrity of network infrastructures when it is configured correctly and is continuously monitored.

Simulation and Schematic Diagram:



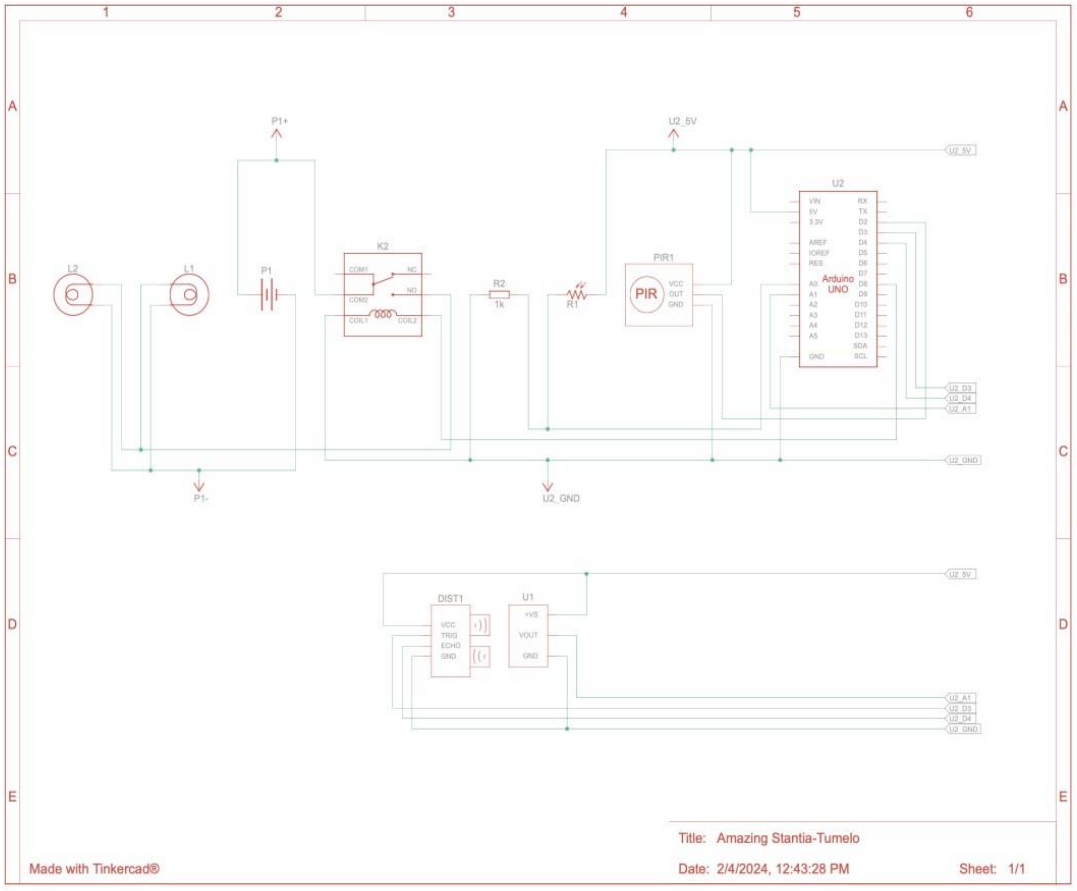


Figure: 1.4 Simulation & Schematic View

6. Components:

1. Arduino or similar microcontroller for central processing
2. Light Dependent Resistor (LDR) sensor to detect ambient light levels
3. Passive Infrared (PIR) sensor to detect motion
4. Ultrasonic sensor to measure distance
5. LED lights or similar actuators for illumination
6. ESP8266 Node MCU Wi-Fi module for wireless communication
7. Breadboard and jumper wires for circuit connections
8. Power source, such as a battery or power adapter
9. Resistors, capacitors, and other electronic components for circuitry

7.Source Code:

```
#include<ESP8266WiFi.h>

String API_KEY = "POXPR2L8AEQBB6F4";
String ssid = "Dinesh's";
String password = "12345678";
String server = "api.thingspeak.com";

int  PHOTO_SEN  =  16;
int LIGHT = 5;
int PIR_SEN = 4;

int US_TRIGGER = 12;
int US_ECHO = 14;
float distance, duration;

WiFiClient client;

void setup(){
pinMode(PHOTO_SEN, INPUT);
pinMode(LIGHT, OUTPUT);
pinMode(PIR_SEN, INPUT);
pinMode(US_ECHO, INPUT);
  pinMode(US_TRIGGER, OUTPUT);
  Serial.begin(115200);
delay(10);
  pinMode(2, OUTPUT);
  digitalWrite(2,                    0);
Serial.print("Connecting to ");
  Serial.println(ssid);
  WiFi.begin(ssid, password);

  while(WiFi.status() != WL_CONNECTED){
    delay(500);
Serial.print(".");
}
```

```
  Serial.println("");
  Serial.println("Wifi Connected");
}

void loop(){
  int light_val = digitalRead(PHOTO_SEN);

 String  data  =  API_KEY;
data+= "&field1=";
  data+= light_val;

  if(light_val==1){      int pir_val =
digitalRead(PIR_SEN);

data+= "&field2=";    data+=
pir_val;    if(pir_val==1){
Serial.println("Man Coming");
digitalWrite(LIGHT, HIGH);
     delay(3000);
    }
    else digitalWrite(LIGHT,LOW); digitalWrite(US_TRIGGER,HIGH);
    delay(10);
    digitalWrite(US_TRIGGER,LOW);
duration = pulseIn(US_ECHO,HIGH);
distance = duration*0.034/2.0;
    data+= "&field3=";
    data+= distance;
    digitalWrite(LIGHT, (distance<=30)?HIGH:LOW);
    data+="\r\n\r\n";
if(client.connect(server,80)){
client.print("POST /update HTTP/1.1\n");
client.print("Host: api.thingspeak.com\n");
     client.print("Connection: close\n");
     client.print("X-THINGSPEAKAPIKEY:          "+          API_KEY          +"\n");
client.print("Content-Type : application/x-www-form-urlencoded\n");
     client.print("Content-Length:
");       client.print(data.length());
client.print("\n\n");
client.print(data);
delay(1000);
     Serial.print("Distance : ");
     Serial.println(distance);
    }

    client.stop();
  }
  else{
    Serial.println("Morning");
digitalWrite(LIGHT, LOW);
  }
}
```

7. Results/Output:

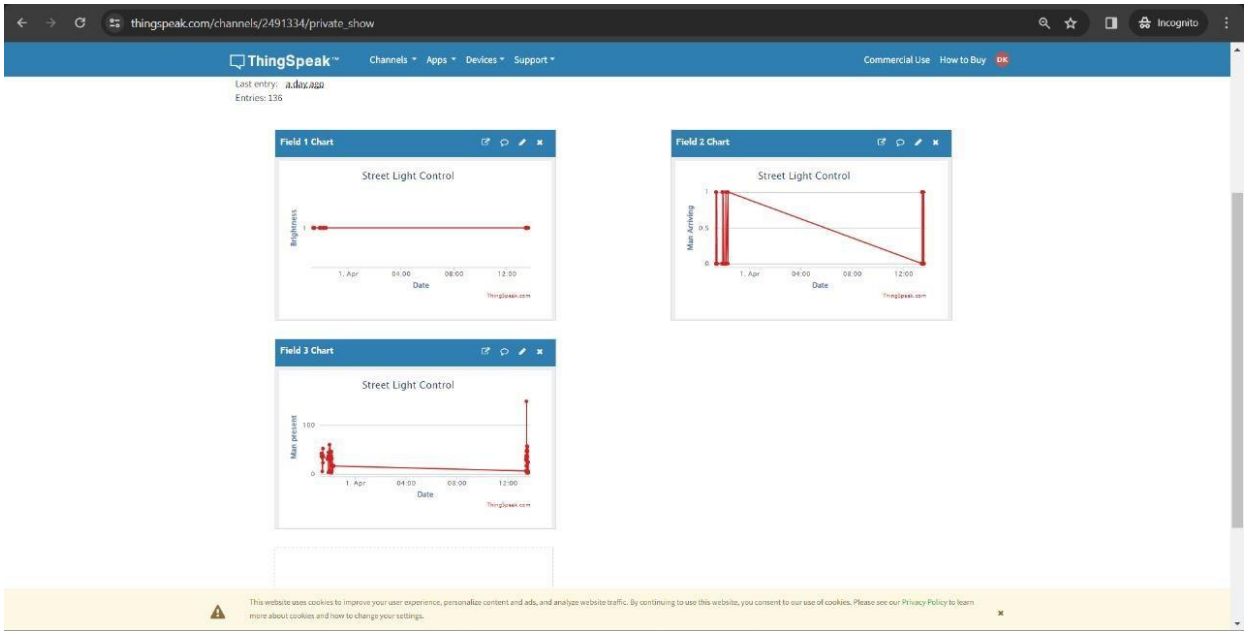
Bank Security Automation

Brightness: 1

Intruder Coming: 0

Intruder present: 23.85

Online Web Application Control System



Online Cloud Data Analytics

8.Conclusion:

More effective in case of cost, workforce and security as compared with today's running complicated and complex light controlling systems. Automatic Street Light Controlling System puts up a very userfriendly approach and could increase the power. The Streetlight controller using LDR based Light intensity & traffic density, in today's growing countries will be paper elaborates the design and construction of automatic street control system circuit. Circuit works properly to turn streetlamp ON/OFF. After designing the circuit which controls the light of the street as illustrated in the previous sections. LDR sensors are the main conditions in working the circuit. If the two conditions have been satisfied the circuit will do the desired work according to the program.

Each sensor controls the turning ON or OFF the lighting column. The streetlights have been successfully controlled by microcontroller. With commands from the controller the lights will be ON in the places of movement when it's dark. Furthermore, the drawback of the street light system using timer controller has been overcome, where the system depends on photoelectric sensor. Finally, this control circuit can be used in a long roadway between them.