**Anti-Theft Flooring System**

**CONTENTS**

|  |  |
| --- | --- |
| **CERTIFICATE………………………………………………………......................** | **i** |
| **DECLARATION……………………………………………………………………** | **ii** |
| **ACKNOWLEDGMENT…………………………………………………………** | **iii** |
| **…** |  |
| **ABSTRACT…………………………………………………………………………** | **iv** |
| **CHAPTER 1………………………………………………………………………...** | **1** |
| **Introduction……………………………………………………………..** | **1** |
| **1.1 About Project………………………………………………….** | **1** |
| **1.2 Aims and objective ………….……………………………..** | **1** |
| **CHAPTER 2………………………………………………………………………..** | **2** |
| **Literature Review……………………………………………………...** | **2** |
| **2.1 Exiting Technology……………………………………………** | **2** |
| **2.2 Identification of Problem………...……………………….** | **2** |
| **CHAPTER 3………………………………………………………………………...** | **3** |
| **3.1 Proposed Methodology/Technology…………………………………..** | **3** |
| **3.2 Circuit Diagram………………………………………………………..** | **4** |
| **CHAPTER 4………………………………………………………………………...** | **5** |
| **4.1 Results and discussion………………………………………………...** | **5** |
| **CHAPTER 5………………………………………………………………………...** | **7** |
| **5.1 Application and Conclusion…………………………………………..** | **7** |
| **CHAPTER 6………………………………………………………………………...** | **8** |
| **6.1 Future Scope……………………………………………………………** | **8** |
| **REFERENCES……………………………………………………………………...** | **9** |

# CHAPTER 1 : INTRODUCTION

**1.1.1 About Project : Antitheft flooring systems are an innovative and effective way to prevent unauthorized access and enhance building security. These systems use various components such as sensors, motors, microcontrollers, and other electronic devices to detect foot traffic and control access to secure areas of a building. The flooring systems can be designed to trigger alarms, activate locks or other security protocols, and provide real-time monitoring and feedback to security personnel. Antitheft flooring systems are commonly used in high-security areas such as banks, military facilities, and research labs, but they can also be adapted for use in other commercial or residential settings where enhanced security is desired. With advances in technology and increasing security threats, antitheft flooring systems are becoming more popular as a cost-effective and efficient way to prevent unauthorized access and protect people and property.**

## Aims and Objective:-

**1.To develop an IoT-based anti-theft flooring system to prevent theft in high-security areas.**

**2.To design a system that uses sensors embedded in the flooring to detect weight and pressure changes.**

**3.To develop a system that can analyze the data collected by the sensors to trigger an alarm if any unauthorized activity is detected.**

**4.To implement machine learning algorithms to detect patterns that may indicate theft.**

**5.To design and implement the system in a way that minimizes false alarms and ensures its effectiveness.**

# CHAPTER 2 : LITERATURE REVIEW

## Existing Technology

Anti-theft flooring systems using Arduino are designed to detect unauthorized access to a specific area by using a sensor system that is connected to an Arduino microcontroller. When an intruder steps on the sensor system, the Arduino detects the intrusion and triggers an alarm or activates other security measures. Here are some examples of existing technology in anti-theft flooring systems using Arduino:

SmartFloor:

SmartFloor is an anti-theft flooring system that uses Arduino technology. It features a modular sensor system that can be customized to fit any area. When someone steps on the sensors, the system detects the intrusion and triggers an alarm. SmartFloor can also be integrated with other security systems like cameras and access control systems.

Security Mat:

Security Mat is another anti-theft flooring system that uses Arduino technology. It features a pressure sensor system that is embedded in the floor mat. When an intruder steps on the mat, the sensor detects the pressure and triggers an alarm. Security Mat can also be customized to fit any area and can be integrated with other security systems.

FloorProtect:

FloorProtect is an anti-theft flooring system that uses Arduino technology to detect intruders. It features a pressure sensor system that is installed beneath the flooring. When an intruder steps on the floor, the pressure sensor detects the intrusion and triggers an alarm. FloorProtect can be used in a variety of environments like banks, offices, and retail stores

* 1. **Identification of the Problem**

**The problem that leads to the utilization of anti-theft measures is the risk of theft or unauthorized access to valuable assets, goods, or information. The theft or unauthorized access can result in financial losses, damage to reputation, and compromise of sensitive information.**

**Businesses and organizations often have valuable assets that are vulnerable to theft, such as cash, equipment, and merchandise. Retail stores, for example, may be at risk of theft by shoplifters, while banks may be at risk of robbery. Similarly, organizations that deal with sensitive information, such as hospitals or research facilities, may be at risk of unauthorized access by individuals seeking to obtain confidential data.**

**Anti-theft measures, such as anti-theft flooring systems, are utilized to prevent or deter theft and unauthorized access. These measures can include physical barriers, surveillance equipment, access control systems, and alarms. Anti-theft measures are designed to increase the security of a facility and reduce the risk of theft or unauthorized access.**

**Overall, the problem that leads to the utilization of anti-theft measures is the need to protect valuable assets and information from theft and unauthorized access. Anti-theft measures are essential for businesses and organizations to maintain their financial stability, protect their reputation, and safeguard sensitive information**

# CHAPTER 3 3.1 Proposed Methodology/Technology

Components Required:

* Ultrasonic sensor
* Servo motor
* Bluetooth module HC05
* Registers And LED’s
* Piezo sensor
* Jumper wires
* Buzzer
* Power supply lithium-ion
* Arduino Uno

# Working :

# An antitheft flooring system can be created using various components including an Arduino Uno, ultrasonic sensor, servo motor, Bluetooth module HC05, registers, LEDs, piezo sensor, jumper wires, buzzer, and a lithium-ion power supply. The system works by detecting foot traffic through the ultrasonic sensor and piezo sensor. The ultrasonic sensor measures the distance between the floor and the person's foot, and if the distance is less than the predetermined threshold, the system sends a signal to the Arduino Uno. The Uno then activates the servo motor, which locks or unlocks the door, depending on the authorization status. The HC05 Bluetooth module can be used to communicate with a mobile device or other Bluetooth-enabled devices for remote access control. The registers and LEDs can be used for monitoring and feedback purposes, while the buzzer provides an audible alert to security personnel or building occupants. The lithium-ion power supply provides the necessary power to run the system. Overall, this antitheft flooring system can provide an effective and efficient way to prevent unauthorized access and improve building security.

# Source Code of Arduino Program:-

#include <Servo.h>

#include <SoftwareSerial.h>

SoftwareSerial B(10,11); //10-RX, 11-TX

const int trigPin = 8;

const int echoPin = 9;

const int buzzer = 7;

const int ledPin = 13;

const int piezoPin = A1;

const int servoPin = 12;

Servo myServo;

int safetyDistance;

void setup() {

pinMode(trigPin, OUTPUT);

pinMode(echoPin, INPUT);

pinMode(buzzer, OUTPUT);

pinMode(ledPin, OUTPUT);

pinMode(piezoPin, INPUT);

myServo.attach(servoPin);

Serial.begin(9600);

B.begin(9600);

}

void loop() {

int piezoValue = analogRead(piezoPin);

int distance = calculateDistance();

Serial.println(analogRead(piezoPin));

// Piezo sensor

if (analogRead(piezoPin)>11) {

digitalWrite(ledPin, HIGH);

B.print("Thief Detected");

B.print(";");

delay(2000);

}

else {

digitalWrite(ledPin,LOW);

B.print("Safe");

B.print(";");

}

// Ultrasonic sensor

if (distance <= 20) { // Change the safe distance here

digitalWrite(buzzer, HIGH);

myServo.write(90);

} else {

digitalWrite(buzzer, LOW);

myServo.write(0);

}

}

int calculateDistance() {

digitalWrite(trigPin, LOW);

delayMicroseconds(2);

digitalWrite(trigPin, HIGH);

delayMicroseconds(10);

digitalWrite(trigPin, LOW);

long duration = pulseIn(echoPin, HIGH);

int distance = duration \* 0.034 / 2;

safetyDistance = distance;

returrn

# CHAPTER 5: Application And Conclusion

Banks and financial institutions: Antitheft flooring systems are commonly used in banks and other financial institutions to protect cash and valuable assets.

Laboratories and research facilities: Antitheft flooring systems can be used in laboratories and research facilities to protect sensitive equipment and prevent theft of valuable research data.

Museums and art galleries: Antitheft flooring systems can protect valuable artwork and artifacts from theft or damage.

Data centers and server rooms: These systems can provide access control to sensitive data centers and server rooms, preventing unauthorized access and data breaches.

Retail stores: Antitheft flooring systems can be used in retail stores to prevent shoplifting and protect valuable merchandise.

Residential buildings: Antitheft flooring systems can be installed in residential buildings to provide access control and enhance overall security,particularly in high-crime areas.

# CHAPTER 6 : Future Scopes

Artificial intelligence (AI): The integration of AI technology in antitheft flooring systems can enhance the accuracy of detection and access control, making them more efficient and effective.

Internet of Things (IoT): The use of IoT technology can enable antitheft flooring systems to communicate with other connected devices and systems, providing a more comprehensive and integrated security solution.

Biometric authentication: The incorporation of biometric authentication technology, such as fingerprint or facial recognition, can enhance access control and prevent unauthorized access.

Energy harvesting: The use of energy harvesting technology, such as piezoelectric materials, can provide power to antitheft flooring systems without the need for external power sources, reducing costs and increasing efficiency.

Advanced materials: The use of advanced materials, such as smart polymers or carbon fiber composites, can improve the durability and functionality of antitheft flooring systems, making them more resistant to wear and tear.

Machine learning: The use of machine learning technology can enable antitheft flooring systems to learn from previous data and improve their accuracy over time, making them more effective and efficient in preventing theft or unauthorized acces