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IOT Based Automated Door Open/Close System Using PIR Sensor and Keypad for Security of a Smart Door Lock System

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ABSTRACT- "IoT Based Automated Door Open/Close System Using PIR Sensor and Keypad for Security of a Smart Door Lock System" is as follows:In this project, we propose an IoT-based automated door open/close system for securing a smart door lock system. The system uses a passive infrared (PIR) sensor to detect motion and a keypad for inputting a security code. When a user approaches the door, the PIR sensor detects motion and triggers the system to check for a valid security code input via the keypad. If the input code is valid, the system opens the door lock, allowing the user to enter. If an invalid code is entered or no code is entered within a specified time, the system triggers an alarm and sends an alert to the owner's mobile device via an internet of things (IoT) platform.The proposed system is designed to be easy to install and use, and it offers enhanced security for a smart door lock system. The system can be remotely monitored and controlled using a mobile device or computer, providing real-time alerts and notifications to the owner. The system is also expandable and can be integrated with other IoT devices, such as surveillance cameras and smart home systems, to provide additional security features.Overall, this project aims to improve the security and convenience of smart door lock systems by leveraging IoT technology and integrating PIR sensors and keypads for enhanced security measures.

KEYWORDS: IoT,Automated door system,PIR sensor,Keypad,Smart door lock,Security,Alarm,Mobile device,Internet of things,Surveillance cameras.

I.INTRODUCTION

The security of homes and businesses is of utmost importance, and smart door lock systems have become a popular solution for enhancing security measures. However, smart door lock systems are vulnerable to hacking and unauthorized access, and there is a need to improve their security measures. In this project, we propose an IoT-based automated door open/close system using a passive infrared (PIR) sensor and a keypad for enhanced security measures.

The system is designed to detect motion and allow access only to authorized individuals with a valid security code. It also includes an alarm and an alert system to notify the owner of any unauthorized attempts to access the system. The proposed system is easy to install and use, and it offers an additional layer of security for smart door lock systems.

The remainder of this project will detail the implementation and functionality of the proposed system, including the hardware and software components used. We will also discuss the system's advantages, limitations, and potential for future improvements.

II.LITERATURE SURVEY

There are several existing studies on IoT-based automated door systems that use PIR sensors and keypads for enhanced security measures.For example, in the study "IoT-based Smart Door Lock System Using PIR Sensor and Keypad," the authors propose a smart door lock system that uses a PIR sensor and a keypad for user authentication. The system is designed to send notifications to the owner's mobile device if an unauthorized attempt to access the system is made.

Another study, "An IoT-Based Door Lock System Using Raspberry Pi and PIR Sensor," proposes a system that uses a Raspberry Pi and a PIR sensor for motion detection and user authentication. The system includes a database of authorized users and can be remotely monitored and controlled using a mobile device or computer.

In a study titled "Smart Security Door Lock System Based on IoT," the authors propose a system that uses a PIR sensor and a magnetic door sensor for motion and access detection. The system includes an alert system that sends notifications to the owner's mobile device if an unauthorized attempt to access the system is made.

These studies highlight the importance of implementing enhanced security measures in smart door lock systems and demonstrate the feasibility of using PIR sensors and keypads for user authentication.

III.PROBLEM STATEMENT

The problem with traditional smart door lock systems is that they are vulnerable to hacking and unauthorized access. Many systems rely solely on Bluetooth or Wi-Fi connectivity for user authentication, which can be easily compromised. There is a need for improved security measures to prevent unauthorized access and provide enhanced security for homes and businesses.The proposed IoT-based automated door open/close system using a PIR sensor and keypad addresses this problem by adding an additional layer of security. The system is designed to detect motion and allow access only to authorized individuals with a valid security code entered via the keypad. The system includes an alarm and an alert system to notify the owner of any unauthorized attempts to access the system. This system offers enhanced security and convenience for smart door lock systems.To address these challenges, we propose an IoT-based smart medical assistant system for older people. The system is designed to assist older people with their healthcare needs, including medication reminders, vital signs monitoring, and emergency assistance. The system aims to provide personalized care and support for older people, reducing their dependence on healthcare providers and improving their quality of life.The problem statement, therefore, is how to design and implement a user-friendly and customizable IoT-based smart medical assistant system that can provide personalized care and support for older people's healthcare needs. The system should be capable of remotely monitoring vital signs, providing medication reminders, and emergency assistance while also being easily accessible and cost-effective. By addressing these challenges, the proposed system can improve the quality of care, reduce healthcare costs, and increase accessibility for older people.

IV.PROPOSED METHODOLOGY

The proposed system is an IoT-based automated door open/close system that uses a PIR sensor and a keypad for enhanced security measures. The system is designed to detect motion and allow access only to authorized individuals with a valid security code entered via the keypad. The system includes an alarm and an alert system to notify the owner of any unauthorized attempts to access the system.

The system consists of the following components:

1. Passive Infrared (PIR) sensor: A motion detection sensor that detects human body heat and movement.
2. Keypad: A user interface for entering the security code to authenticate access.
3. Microcontroller: An Arduino or Raspberry Pi microcontroller to process the input from the PIR sensor and keypad and control the door lock.
4. Door Lock: An electric door lock that can be controlled by the microcontroller to lock and unlock the door.
5. Alarm: An alarm that triggers when an unauthorized access attempt is made.
6. Internet of Things (IoT) Platform: An IoT platform like ThingSpeak or AWS IoT to send alerts to the owner's mobile device.

The system works as follows:

1. The PIR sensor detects motion and sends a signal to the microcontroller.
2. The microcontroller prompts the user to enter a security code via the keypad.
3. If the entered code is valid, the microcontroller sends a signal to the door lock to unlock the door.
4. If the entered code is invalid or no code is entered within a specified time, the alarm triggers, and an alert is sent to the owner's mobile device via the IoT platform.

The proposed system is easy to install and use, and it offers enhanced security for smart door lock systems. The system can be remotely monitored and controlled using a mobile device or computer, providing real-time alerts and notifications to the owner. The system is also expandable and can be integrated with other IoT devices, such as surveillance cameras and smart home systems, to provide additional security features.

V.PROJECT PURPOSE

The purpose of the IoT-based automated door open/close system using a PIR sensor and keypad is to provide enhanced security measures for smart door lock systems. The system is designed to prevent unauthorized access by adding an additional layer of security through the use of a PIR sensor and keypad for user authentication.

The proposed system offers the following benefits:

1. Enhanced Security: The system provides enhanced security for smart door lock systems by adding an additional layer of security through the use of a PIR sensor and keypad for user authentication. This helps to prevent unauthorized access and keep homes and businesses safe.
2. Convenience: The system provides a convenient way for authorized individuals to access the building or room by entering a security code on the keypad, eliminating the need for physical keys or fobs.
3. Real-time Monitoring: The system can be remotely monitored and controlled using a mobile device or computer, providing real-time alerts and notifications to the owner in case of any unauthorized attempts to access the system.
4. Expandability: The system can be easily expanded and integrated with other IoT devices, such as surveillance cameras and smart home systems, to provide additional security features.

Overall, the purpose of the proposed system is to provide an easy-to-use and effective solution for enhancing the security of smart door lock systems.

VI.FUTURE ENHANCEMENT

The proposed IoT-based automated door open/close system using a PIR sensor and keypad has the potential for further enhancement in the future. Here are some potential areas for improvement:

1. Biometric authentication: Adding biometric authentication, such as fingerprint or facial recognition, could provide an additional layer of security and convenience.
2. Voice command integration: Integrating the system with voice command technology, such as Amazon Alexa or Google Assistant, could provide a more convenient way for users to access the system.
3. Machine learning-based security: Machine learning algorithms could be used to learn the user's behavior and detect any suspicious activity, improving the system's overall security.
4. Energy efficiency: The system could be made more energy-efficient by using low-power sensors and optimizing the code for power consumption.
5. Cloud-based storage: Storing data in the cloud could provide a more secure and reliable way to store user information and access logs.
6. Overall, these enhancements could further improve the system's security, convenience, and efficiency, making it a more attractive option for homes and businesses looking for enhanced smart door lock security.

VII.CONCLUSION

In conclusion, the proposed IoT-based automated door open/close system using a PIR sensor and keypad provides an effective solution for enhancing the security of smart door lock systems. The system adds an additional layer of security through the use of a PIR sensor and keypad for user authentication, which helps to prevent unauthorized access and keep homes and businesses safe. The system is easy to use and offers real-time monitoring, convenience, and expandability.In the future, the system has the potential for further enhancement, including biometric authentication, voice command integration, machine learning-based security, energy efficiency, and cloud-based storage. These enhancements could further improve the system's security, convenience, and efficiency, making it an even more attractive option for homes and businesses looking for enhanced smart door lock security.Overall, the proposed IoT-based automated door open/close system using a PIR sensor and keypad provides an effective and convenient solution for enhancing the security of smart door lock systems.

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