

SECURE DWELL: HOME SECURITY MODEL USING IOT

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ABSTRACT

The project pioneers an advanced home security paradigm, leveraging ESP8266 Node MCU, PIR sensor, Buzzer. The PIR (Passive Infra-Red) sensors act as efficient motion detectors, initiating a real-time buzzer alert upon sensing human activity. A pivotal feature is the establishment of communication between the system and the users mobile device. This connectivity empowers users with remote monitoring capabilities, offering real-time motion visualization and enabling control over electronic devices within the home environment. Beyond security, the project explores home automation technologies, providing an inclusive solution to modern residential living. The systems adaptability allows users to remotely monitoring electronic devices, ensuring energy efficiency and convenience. The synergy of security, IoT, and automation technologies in this project represents a comprehensive approach to fortifying homes against potential threats while offering users unprecedented control and awareness over their living spaces.

KEYWORDS: ESP8266 Node MCU, PIR sensor(Passive Infra-Red), Buzzer

INTRODUCTION

The "Secure Dwell Home Security Model using IoT" project is a sophisticated and innovative solution designed to enhance home security through the integration of IoT technology. At its core, the system utilizes motion sensors to detect any movement or activity within the monitored area, triggering an immediate response in the form of a buzzer alert. This proactive approach ensures that residents are promptly notified of any potential security threats, allowing for swift action to be taken. One of the key features of the system is its seamless integration with the Blynk app, which enables users to receive real-time alerts, messages, and emails on their smart phones or other devices. This connectivity empowers homeowners to stay informed and in control of their home security, even when they are away from the premises. By leveraging the power of IoT, the project aims to provide a comprehensive and user-friendly security solution that prioritizes convenience and effectiveness. Through the coordination of sensors and a microcontroller, the system can

effectively monitor and respond to security incidents, ensuring the safety and well-being of residents. The intuitive design of the system makes it easy to set up and operate, allowing users to customize settings and preferences according to their needs. By combining advanced sensor technology with smart alert mechanisms, the project offers a robust defense against unauthorized access and potential security breaches. Overall, the project represents a cutting-edge approach to home security, emphasizing proactive monitoring, real-time alerts, and user-centric design. With its focus on reliability, efficiency, and affordability, the system aims to provide homeowners with a comprehensive security solution that offers peace of mind and protection for their property.

LITERATURE SURVEY

Sushma .N. Nichal, Prof. J.K. Singhas done abstraction of Smart supervisor system using IOT based on embedded Linux O.S. with ARM11 architecture. In this Paper they have implemented real-time video monitoring system and acquired data. In this system they have also used PIR, temperature, Humidity sensors the system first requires authentication from user to activate the system if the system detect human it will send that data to the server or user smart phone [1].

Khushbu H Mehta, Niti P Gupta have presented real time monitoring and security system using Raspberry Pi the system allow user to live monitor from any place. In the system Authors have discuss that if motion is detected it will check for face detection if the face is detected it will stored on local storage, they have used background subtraction Algorithm for face detection. Authors concluded that system is able to identify faces and user can able to monitor remotely [2].

R.Chandana et al have implemented monitoring and home security system using think and speak with the help of raspberry Pi, they have used Gyro sensor to detect the movements of person if the movements is detected camera will be captured image and the image will be send to the owners mail id with captured image. They have also stated some importance of this system. Authors have concluded that this system is important for security purpose [3].

K Saravana Kumar et al have developed the security system with proximity sensor, Raspberry Pi, and Camera, proximity sensor detect the person after detecting the person camera will be initiated and capture the image and image will be uploaded to drop box and user gets the notification about the intruder in the form of SMS. They have discussed few advantages like cost effective, portable. Authors concluded that this security system is useful for security of homes [4].

Dhadiwal Kalpesh Paraskumar et al have designed and implemented security system with Raspberry Pi, IR sensor and camera IR sensor detects the person then the camera will be capture image of intruder and microphone records the vice of the person then the captured image along with vice recorded will be send to user mobile phone. They have also discussed advantages and

disadvantages of this system in this paper. Authors concluded that this system is useful for real time monitoring of home [5].

Yogita Vijay Narkhede, S. G. Khadke have presented smart security system with Raspberry Pi and IR sensor if IR sensor detects the person camera will capture image as well as video of the person, the data then encrypted first and then decoded. User will get notification on his mobile device. Authors discussed that user can also perform the live streaming and provide security. Authors have concluded that this system is important for commercial places; they have discussed few advantages of the system [6].

EXISTING METHODS

Traditional Alarm Systems:

Problems: These systems may lack remote monitoring capabilities and can be prone to false alarms or limited coverage.

Project Solution: Our project overcomes these limitations by integrating IoT technologies, allowing for remote monitoring via a mobile app. Additionally, the use of PIR sensors enhances accuracy in detecting human activity, reducing false alarms.

Closed-Circuit Television (CCTV) Systems:

Problems: CCTV systems can be expensive to install and maintain, and reviewing footage may be time-consuming. They also may not provide real-time alerts for immediate action.

Project Solution: Our project offers a cost-effective alternative by leveraging IoT components like ESP8266 Node MCU and PIR sensors. The real-time monitoring feature via the Blynk app provides instant alerts, enabling prompt response to security events without the need for manual review of footage.

Professional Monitoring Services:

Problems: These services often come with subscription fees and may have limited customization options. They also rely on external monitoring centers, which can introduce delays in response times.

Project Solution: Our project provides an affordable DIY solution that puts control directly in the hands of the homeowner. By integrating Blynk app connectivity, users can customize their security settings and receive instant alerts without relying on external monitoring services, thereby reducing costs and response times.

DIY Home Security Kits:

Problems: These kits may lack integration with other smart home devices and may have limited expansion capabilities. Setup and configuration can also be complex for inexperienced users.

PROPOSED METHOD

The proposed Secure Dwell Home Security Model using IoT is designed to revolutionize residential security measures by leveraging cutting-edge technology to create a robust and efficient security system. This innovative solution integrates IoT principles with advanced sensor technologies and smart communication protocols to provide comprehensive protection for homes. The system's core functionality revolves around the detection of motion or movement by sensors strategically placed within the monitored area. Upon detecting any suspicious activity, the sensors promptly send signals to the central microcontroller, which triggers an audible alarm through a buzzer, alerting occupants of potential security breaches.

In addition to the audible alarm, the system incorporates the Blynk app, a versatile mobile application that enhances the alert mechanism by sending real-time notifications and alert messages to users via email. This seamless integration of the Blynk app ensures that homeowners receive immediate alerts and stay informed about any security incidents, enabling them to take swift action to address the situation. The user-friendly interface of the Blynk app allows for easy monitoring and control of the security system, empowering users to manage security settings remotely and stay connected to their homes at all times.

Furthermore, the Secure Dwell Home Security Model offers a comprehensive security solution that prioritizes user convenience, reliability, and effectiveness. By combining state-of-the-art sensor technologies with IoT connectivity, the system provides a proactive approach to home security, enabling homeowners to proactively monitor their properties and respond swiftly to any security threats. The system's versatility allows for seamless integration with existing home automation systems, enhancing the overall security infrastructure and creating a cohesive and interconnected security ecosystem.

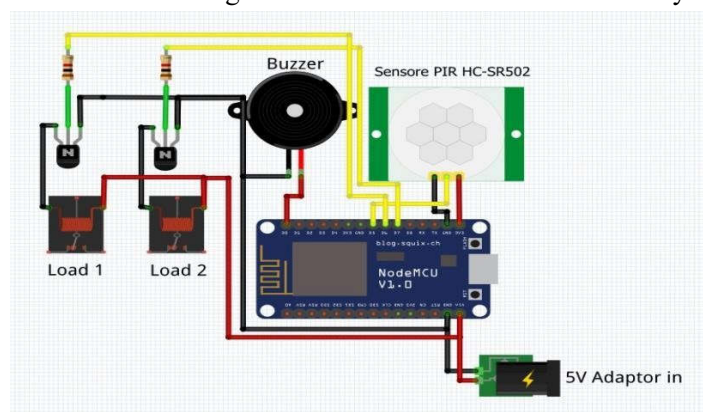


Fig1: Architecture of the proposed system

THE DESIGN STRUCTURE OF THE COMPARATORS

Comparators are essential components in electronic circuits that compare two voltages or currents and output a digital signal indicating which input is larger. In the context of your Secure Dwell Home Security Model using IoT, comparators play a crucial role in the motion detection system. In the Secure Dwell Home Security Model project, the comparators serve as essential components that compare the analog output signals from the PIR (Passive Infrared) sensor with a predefined threshold voltage. The comparators are responsible for determining whether motion has been detected based on the difference between the sensor output and the reference voltage. By setting the threshold level appropriately, the comparators can distinguish between background noise and actual motion events, ensuring accurate detection. The design structure of the comparators includes hysteresis to prevent false triggering and ensure stable operation. Hysteresis introduces a small delay in the comparator's response, helping to filter out noise and maintain a consistent output signal. This feature enhances the reliability of the motion detection process and reduces the likelihood of false alarms. Furthermore, the comparators are integrated into the system architecture to work in conjunction with the microcontroller and alarm system. When the comparator detects a significant change in the sensor output indicative of motion, it triggers the buzzer to sound an alarm alerting occupants. Simultaneously, the comparator signal is used to activate the Blynk app, which sends alert messages and emails to notify users of the security breach. Overall, the design structure of the comparators in the Secure Dwell Home Security Model project is crucial for accurate motion detection and reliable alarm triggering. By incorporating hysteresis and precise threshold settings, the comparators ensure efficient operation, minimize false alarms, and enhance the overall security system's effectiveness in detecting and responding to potential threats.

RESULT ANALYSIS

The result analysis of the "Secure Dwell Home Security Model using IoT" project will involve a comprehensive evaluation of the system's performance and effectiveness. This assessment will focus on key metrics such as detection accuracy, response time, alert delivery efficiency, user interface usability, system reliability, integration testing, security assessment, and user satisfaction feedback. By analyzing the system's ability to accurately detect and respond to security threats, evaluating the speed and reliability of alert notifications, assessing the user interface for ease of use, and testing the system's overall reliability and security features, the project team can gain valuable insights into the system's functionality and performance. Additionally, gathering

feedback from users will provide essential information on their experience with the system and help identify areas for improvement to ensure that the "Secure Dwell Home Security Model using IoT" system meets the desired objectives of enhancing home security through IoT technology.

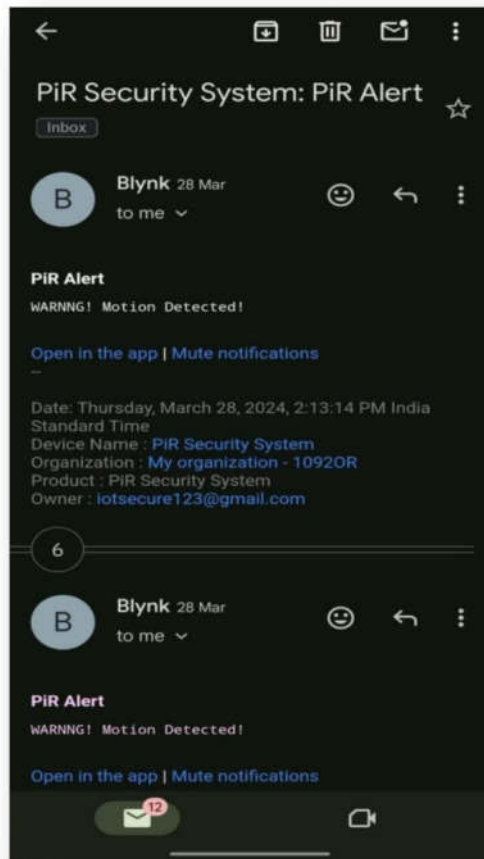


Fig.2: Alert Email

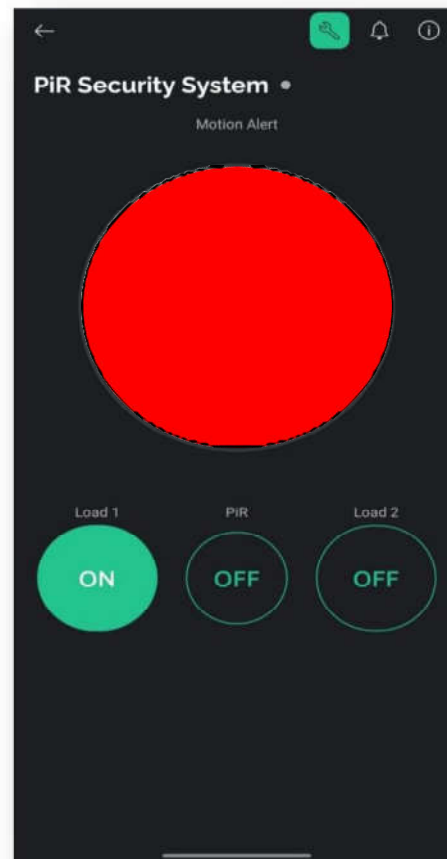


Fig.3: Alert Buzzer sound

CONCLUSION

After conducting extensive research on various security systems, it has been observed that most of them utilize Raspberry Pi as the main component. While Raspberry Pi is a versatile and powerful tool, it may not be affordable for everyone. This is where our project comes in, as we have utilized the ESP8266 Node MCU, which is not only cost-effective but also has the capabilities of both a microcontroller and a wifi module. With the help of this device, our system is able to detect human movement through PIR sensors, detect fire through smoke sensors, and monitor temperature through temperature sensors. The ESP8266 Node MCU also enables remote access and notification to the user in case of any suspicious activity. Our project aims to provide a comprehensive and affordable solution for home security, while also exploring the potential of home automation.

technologies. By combining security, IoT, and automation, we aim to create a system that not only protects homes from potential threats but also offers users control and awareness over their living spaces. This project highlights the importance of cost-effective security systems and the use of various tools and parameters to ensure the safety of homes and other spaces. With the ability to be accessed remotely through mobile devices, our system offers convenience and peace of mind to users. Overall, our project showcases the potential of integrating different technologies to create a comprehensive and inclusive solution for modern residential living.

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