International Journal of Latest Engineering Science (IJLES) E-ISSN: 2581-6659

DOI: 10.51386/25816659/ijles-v7i1p103

Volume: 07 Issue: 01 **January to February 2024** **www.ijlesjournal.org**

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Abstract *- The project involves the creation of an extensive home security system with theprimary goal of safeguarding residential properties against potential threatsand intruders. This all-encompassing system is comprised of various essentialcomponents, including a variety of sensors such as motion sensors, door/windowcontact sensors, and glass break detectors. These sensors serve to detectunauthorized entry and unusual activities in and around the home. Additionally,strategically placed security cameras are integrated into the system, enablingreal-time video surveillance and the recording and streaming of video footage. This capability ensures that any potential threats or intruders are captured on camera. For added security, a remotely controllable solenoid lock is installed on key entry points like doors and gates. This solenoid lock can be operated remotely, providing an extra layer of protection by preventing unauthorized access. To enhance access control and security, the system incorporates facial recognition technology, allowing it to identify individuals attempting to enter the premises. Authorized users gain access, while unrecognized faces trigger immediate alerts and notifications. Furthermore, the system is equipped with a Telegram bot that delivers instant notifications to homeowners and authorized users in the event of security breaches or incidents. These notifications may include images or video clips captured by the security cameras, providing real-time updates and raising awareness of potential threats.*

Keywords - *Home security system, Safeguard, Motionsensors,Door/window contact operation, Solenoid lock, Facial recognition technology, Secure access control.*

I. INTRODUCTION

The introduction in the provided paragraph lays the foundation for a specific project that revolves around the development of an innovative "home security system with automatic door operation using a Telegram bot." This introduction serves the crucial purpose of outlining the central objectives and distinctive features of the project. At its core, this project aims to create a home security system that goes beyond conventional solutions. It seeks to not only bolster the security of residential properties but also to introduce cutting-edge automation and remote control capabilities into the mix. Unlike traditional security systems, this project places a particular emphasis on the integration of a Telegram bot—a digital communication tool that will act as the central control hub for the entire security system.

The inclusion of the Telegram bot signifies a leap into modernity and efficiency. This technology opens up new avenues for homeowners to oversee and manage their home security from afar. It offers an elevated level of convenience and interactivity, enabling users to maintain a watchful eye on their property and swiftly respond to any security events. The Telegram bot also implies that users can receive instantaneous notifications and alerts, ensuring that they remain in the know regarding the security status of their home, no matter where they are. A standout feature of this project is the implementation of automatic door operation. This feature adds an additional layer of security and convenience. By automating the doors, homeowners gain remote control over access to their property, allowing them to grant or deny entry as the situation warrants. This not only heightens security but also instills a sense of confidence and tranquility in homeowners, knowing that they possess the ability to govern their home's access points with precision and ease. Thus, the introduction provides a succinct yet comprehensive

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overview of the project's fundamental objectives and distinctive qualities. This project aspires to craft a sophisticated, user-friendly security solution that marries traditional home security with state- of-the-art automation via the integration of a Telegram bot and the implementation of automatic door operation. The ultimate goal is to empower homeowners with enhanced control, convenience, and peace of mind in safeguarding their cherished abodes.

II. LITERATURE SURVEY

Extensive research and literature exist on online marketplaces and art platforms, forming a foundational understanding of the project's significance and potential influence. Several pertinent studies and articles contribute to the project's context:

1. A Comprehensive Study on Internet of Things in Smart Home Security: Issues, Challenges, and CountermeasuresThis paper involves a comprehensive review and analysis of existing research, studies, articles, and publications related to home security technologies and solutions. It aims to provide an overview of the current state of knowledge in the field, highlight key findings, identify research gaps, and establish a foundation for further research or the development of home security systems

AUTHOR:S. M. Riazul Islam, Daehan Kwak, et al.

2. Smart Home Security: Current Challenges and Future Research Directions

The paper systematically examines several critical issues that have emerged as major impediments to the widespread adoption of secure smart home technologies. These challenges include concerns surrounding privacy, where the intrusion into personal lives through connected devices raises substantial ethical and legal questions and addresses the pressing problem of intrusion detection, highlighting the vulnerability of smart homes to various forms of cyberattacks and unauthorized access

AUTHOR:Md Zakirul Alam Bhuiyan, Md Shohrab Hossain, et al.

3. Home Automation System Using Zigbee

This research project introduces a comprehensive wireless home automation system that leverages Zigbee technology, offering a versatile platform for enhancing home security and control. Zigbee, a low-power, wireless communication protocol, forms the backbone of this system, providing the means for various smart devices within the home to communicate seamlessly and efficiently. The applications of this technology in home security are manifold. By deploying Zigbee-enabled sensors, such as motion detectors, door/window sensors, and surveillance cameras, homeowners can create a robust security ecosystem. These devices can interact with each other and with a central hub to trigger alerts, notifications, or automated actions when suspicious activity is detected, ensuring the safety and peace of mind of the occupant.

AUTHOR:M. D. Jeya Bharathi, Dr. K. Rajasekaran

4. Security in Wireless Sensor Networks for Home Healthcare

This paper delves into the critical realm of security considerations within wireless sensor networks, with a specific focus on their application in the context of home healthcare and monitoring systems. Wireless sensor networks have gained immense traction in recent years due to their potential to revolutionize healthcare by enabling remote patient monitoring, early disease detection, and personalized healthcare services. However, their widespread adoption also raises significant security challenges that must be meticulously addressed.

AUTHOR: F. M. E. A. El-Samie, K. El-Malek, et.

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5. Smart Home Automation Security: A Literature Review

This comprehensive literature review delves into the intricate landscape of security challenges and innovative solutions within the domain of smart home automation systems, shedding light on the latest research trends that have emerged in this rapidly evolving field. Smart home automation systems, powered by Internet of Things (IoT) technologies, have witnessed explosive growth in recent years, promising unparalleled convenience and efficiency for homeowners. However, this surge in connectivity and automation also exposes these systems to a host of security vulnerabilities, necessitating rigorous examination and robust countermeasures. The review starts by elucidating the diverse security challenges that smart home systems encounter. It explores issues such as unauthorized access to smart devices, data privacy concerns, and the potential for network eavesdropping or tampering. Additionally, it delves into the emerging threats specific to these systems, including the risk of botnet attacks and the compromise of interconnected devices

AUTHOR:Marayam Ahmad, Naeem Ramzan, et al.

III. POPOSED SYSTEM

Our proposed home security system represents a significant advancement over the existing setup, offering a comprehensive suite of features to bolster home security and provide homeowners with enhanced peace of mind. The system's core components include motion sensors, surveillance cameras, remote monitoring capabilities, an alarm system, integration with smart home systems, and a reliable backup power supply. This combination of features ensures a multi- layered security approach. Motion sensors serve as the initial line of defense, detecting any unauthorized movement within the home or its vicinity. Surveillance cameras provide real-time video surveillance, capturing any potential threats or intrusions and enabling homeowners to visually monitor their property.

Remote monitoring is a key aspect of the system, allowing homeowners to access and control their security system from anywhere through a mobile app or web interface. This remote accessibility ensures that homeowners are constantly connected to their home's security status, even when they are away. The inclusion of an alarm system adds an additional layer of protection. In the event of a security breach, the alarm can be triggered to alert both homeowners and, if desired, local authorities or security services. Integration with smart home systems enhances convenience and control. Homeowners can seamlessly incorporate the security system into their existing smart home ecosystem, enabling coordinated actions with other smart devices and routines.

One notable feature of our system is the utilization of a face recognition system. This advanced technology adds an extra layer of access control. It can recognize authorized individuals, granting them access while triggering alerts for unrecognized faces, enhancing overall security. Importantly, our system is designed to be highly customizable. Homeowners can tailor the components and features to align with their specific security needs and budget. This flexibilityensures that the system can be adapted to different home environments and user preferences. Lastly, the presence of a backup power supply ensures that the system remains operational even during power outages or disruptions, preventing any gaps in security coverage.

IV. CONCLUSION

In the conclusion, we reflect on our initial objectives and the successful implementation of key features. Our primary goal was to enhance home security by creating a system that allows for remote control and monitoring while automating door operations for added convenience. We have achieved these objectives through a well-rounded implementation. Our system seamlessly integrates various sensors, including motion sensors and cameras, positioned strategically around the home to bolster security. These sensors play a pivotal role in detecting intruders and triggering responses within the system. Motor control software has been effectively employed to automate door operations, enabling the locking, unlocking, opening, and closing of doors and gates, all under the user's control through a Telegram bot. Notification of the Telegram bot, it serves as the central interface for controlling

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and monitoring the security system. Users can issue commands such as "/lock" or "/unlock" through the bot, receive real-time status updates on their doors, and access security alerts and notifications. We've also prioritized security and reliability by implementing authentication, encryption, and robust error handling measures to protect against unauthorized access and ensure the system's dependable operation.

One of the most significant achievements of our project is the improvement in user experience. Homeowners now enjoy the convenience of managing their security system remotely, granting them peace of mind knowing they can monitor and control their doors from anywhere. The system's adaptability to different security modes, including home and away settings, further enhances its usefulness. Alerts and notifications keep homeowners informed of critical security events in real time, fostering a heightened sense of security. As we look to the future, there is ample room for enhancements. We envision incorporating additional sensors for a more comprehensive security system, expanding support for various home automation devices to create a more integrated home ecosystem, and refining the user interface to further enhance user experienceTo illustrate the system's functionality, we've provided tangible demonstrations and examples, including video clips showcasing automatic door operations in response to bot commands and screenshots displaying real-time security alerts in the Telegram bot interface. These demonstrations offer a clear glimpse into the system's practical applications and how it benefits homeowners. Thus, the project has successfully realized its objectives, offering enhanced security, convenience, and automation. It empowers homeowners with remote control and monitoring capabilities, real-time alerts, and robust security measures. As we continue to explore future enhancements, this project represents a significant step toward creating a safer and more connected home environment.

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