Smart Security Alert System

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Abstract: This paper proposes the development of a smart security system that utilizes microwave and piezoelectric sensors to detect unauthorized entry into a restricted area. The sensor data is sent to the cloud platform, which triggers the activation of a camera to capture the face of the intruder. The system is designed to be cost-effective, easy to install, and highly accurate in detecting unauthorized access. The system uses the Internet of Things (IoT) technology to connect the sensors to the cloud platform, where machine learning algorithms are used to analyses the sensor data and trigger the camera activation. The proposed system has significant potential for use in various applications, such as home security, industrial security, and public safety. The project aims to provide a reliable, scalable, and affordable solution for securing restricted areas. The system's performance is evaluated using various metrics, including accuracy, precision, and false positive rate. The results demonstrate that the proposed system is highly effective in detecting unauthorized access and can be easily integrated with existing security systems. The proposed smart security system offers an innovative solution for addressing security challenges and has significant potential for future research and development.

Keywords: Internet of Things (IoT), Image processing, PIR sensors, Camera.

I. INTRODUCTION

IoT based Smart Security Alert System is a system which is made for maintaining the security. This threat protection device serves as an intelligent surveillance system. The main objective of this project is to create an intelligent screening system that monitors the surroundings in which it is operated. This gadget is placed in a location where only authorized people are permitted to use it. That particular region is only acceptable to those who are authorized. If any unauthorized individuals visit that region, this device hardware will detect them and, if the person identified is valid, the system will continue to monitor the area; if not, the buzzer on the system will ring and an alert message will be sent through mail along with a picture to the authorized person of that area.

A camera is used in this system, along with PIR sensors and a buzzer for alerting purposes. Also, a storage device is used, since it is the sole place where the taken photographs will be saved, together with the fundamental information about the recognized person name, designation, and contact information. When an authorized person approaches that specific region, the camera will capture an image. Using face recognition system, it will compare that image, and when a match is found, the buzzer won't sound. Since some authorized persons are allowed to be there. If the person identified is not recognized, then the system will send a mail. This system is built on the IoT (Internet of Things) concept, and these kinds of technologies are used to improve security. Using this will improve that location's security.

II. RELATED WORKS

The research problem that motivates the project are basic security systems that use sensors on walls or motion detection sensors can be avoided by hiding behind objects or simply identifying and disabling them. To secure and monitor the area in absence of authorized persons, the Smart Security Alert System is proposed which will identify the presence of unauthorized person and gives alert to the authorized person.

The objective of the project is to notify the authorized person of an unauthorized person's presence in an area such as an industry, a warehouse, or a jewelry store. Face detection is being integrated to eliminate false positive alarms and ensure that
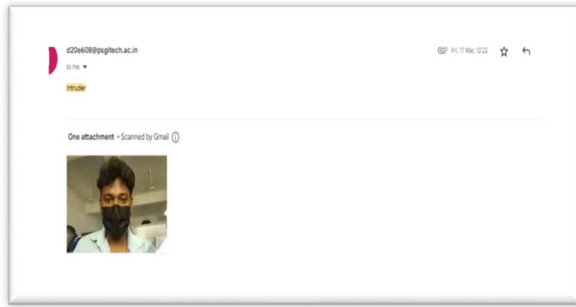
Fig.7 Mail alert

VI. CONCLUSION:

In conclusion, the smart security system we have developed using microwave and piezoelectric sensors has proven to be a highly effective solution for detecting unauthorized entry into a protected area. By combining the two types of sensors and sending the data to the cloud, we have been able to activate a camera and capture images of individuals entering the area without permission. The use of face detection technology, which allowed us to identify these individuals and take appropriate action.

Overall, the system has demonstrated its ability to provide real-time monitoring and response capabilities, making it an ideal solution for security applications in a variety of settings. With the increasing need for effective security measures in both residential and commercial environments, we believe that this system has great potential to make a significant impact in the field of security technology.

VII. FUTURE SCOPE:

The smart security system that we have developed using microwave and piezoelectric sensors has great potential for further development and expansion in the future. Some of the possible future scopes for this project are Integration with other smart home devices: Our security system can be integrated with other smart home devices, such as smart locks, smart lights, and smart thermostats. This will allow for a more comprehensive and interconnected security system that can provide a higher level of protection for the home or building.

Improved face recognition technology: The face recognition technology used in the cloud platform can be further developed and enhanced to improve its accuracy and efficiency. This will allow for better identification and tracking of individuals entering the protected area, and enable quicker and more effective response to potential threats. Mobile application integration: A mobile application can be developed that will allow users to monitor the security system remotely, receive alerts and notifications, and view live camera footage from anywhere at any time. Integration with artificial intelligence: The integration of artificial intelligence can enhance the system's ability to learn and adapt to changing environments and situations, allowing for more sophisticated threat detection and response capabilities.

Expansion to larger areas: The system can be expanded to cover larger areas, such as parking lots, warehouses, or manufacturing facilities, with the use of multiple sensors and cameras. This will provide enhanced security for larger facilities and help reduce the risk of security breaches. Overall, the future scope for this project is promising, with many opportunities for further development and expansion in the field of smart security technology

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