

Motion Detection System for Security Using IoT- Survey

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Abstract - Because of the frequency and pervasiveness of burglaries, an effective and dependable intrusion detection system with an alarm system has become an absolute must. Attacks against homes, workplaces, businesses, and banks are becoming more common. Motion may now be detected as a consequence of technological advancements by detecting a change in the speed or vector of an item in the field of view. Mechanical devices that physically interact with the field, as well as electrical devices that measure and monitor changes in the supplied environment, can be utilized to do this. The motion detector is used in a wide range of applications, such as home automation systems and energy efficiency systems. This project employs an embedded microcontroller system capable of detecting intruder mobility in a confined region and activating an alarm system and motion detection system. A passive infrared sensor, on the other hand, recognized the person's mobility by utilizing the person's body heat. The motion detector in this project is a passive infrared (PIR) sensor coupled to a microcontroller that activates the alarm system and any other associated output device to notify the house owner. Early testing of the design confirmed that it performed as planned.

1.INTRODUCTION

It must consider the conduct of persons who are attempting to trespass or cause damage. The degree of protection from danger, loss, and crime is referred to as security. Humans have fought to defend their lives, property, and professions throughout history. People's busy lifestyles need remote control of their home equipment, which increases the need for home monitoring. Now that we have everything, we can develop something that would offer us with perfect security. The very beginning of this was a simple alarm system that included warning suspicious actions at a low cost. An embedded microcontroller system capable of detecting intruder mobility in a limited area and activating an alarm system and motion detection system. 24 hour monitoring, difficult to hack, ability to operate doors, and motion sensor are some of the common qualities of motion detection alarm and security systems. The pyro electric gadget, which detects motion by monitoring changes in the infrared levels emitted by nearby objects, was employed in this study. The main goal of this project work is to build a system that detects human movement, buzzes an alert, and captures an image of the intruder, which is then compared to the owner's image. This is a well-organized and sophisticated intruder motion detector alarm and security system that can identify the presence of human bodies and quickly notify the owners.

This system offers a low-cost security system that may be installed anywhere in the home.

2. RELATED WORK

a. USING SENSOR NETWORK IN MOTION DETECTION BASED ON DEEP FULL CONVOLUTIONAL NETWORK MODEL by Qichang Xu

This study describes the limitations of traditional moving target detection methods in complex background, such as low detection precision and high complexity, and proposes a moving-target detection based on sensor network without taking into account the overall structure information of the video frame image. To begin, a low-power motion detection wireless sensor network node is established to capture motion detection data in real time. Second, the video scene's backdrop is quickly recovered using the time domain averaging technique, and the video sequence and background picture are channel-merged to form a deep full convolutional network model. Finally, to distinguish moving objects, the network model is used to learn the deep properties of the video picture and output the pixel-level classification results. This method not only adapts to complex video scenarios of varied sizes, but it also includes a simple background extraction mechanism that improves detection performance dramatically.

b.MOTION DETECTION AND ANALYSIS WITH FOUR DIFFERENT DETECTORS by Ching Yee Yong, Rubita Sudirman and Kim Mey Chew

The authors define motion as a change in the speed or vector measurement of an item or objects in the field of vision. Motion detection can be accomplished through the use of electronic or mechanical devices that interact with or measure changes in the supplied environment. A monitoring system is developed in this study by merging motion detection technology with modified commonly known algorithms written in C sharp and Matlab. The outcomes of this study are expected to be informative and beneficial in aiding users with motion detection and analysis. Four unique motion detectors' performance is being compared. The Morph filter provides a more accurate and smooth detection in three trials at three different rates of motion. In conclusion, an effective motion assessment and monitoring system has been developed for the improvement of the motion detection ability.

c.PIR SENSOR BASED SECURITY SYSTEM by Sanikommu Umamaheswari

This paper describes a security system based on passive infrared sensors (PIRs). Using this sensor, we can save power, have effective management at a cheap cost, and only need a little amount of memory space. When an intruder or person passes through the system or site where it is installed, the PIR sensor detects a change in infrared radiation levels. Changes in voltage are induced by changes in radiation levels, and the signal is amplified with this voltage, resulting in the generation of sound. As a result, it is useful in a number of applications and industries. When compared to the present system, this sort of technology offers various advantages.

d.EFFICIENT HUMAN MOTION DETECTION WITH ADAPTIVE BACKGROUND FOR VISION-BASED SECURITY SYSTEM by Fadhlan Hafizhelmi Kamaru Zaman, Md. Hazrat Ali, Amir Akramin Shafie, Zairi Ismael Rizman.

The authors of this article emphasize the importance of motion detection in video surveillance systems, notably for video compression, human detection, and behavior analysis. Various approaches have been used to detect motion in a continuous video stream, but for a real-time video surveillance system, we need motion detection that can provide accurate detection even in non-static backgrounds, regardless of surroundings (outdoor or indoor), object speed and size, and is resistant to camera noisy pixels or sudden changes in light intensity. This is crucial for ensuring the security of a monitored parameter or location. We provide a technique for identifying human motion in real-time video streams that employs adaptive background removal and camera noise reduction in this work.

3. CONCLUSIONS

A home security system's feature will garner a lot of attention in the future. People are getting increasingly worried about defending their houses from burglars. When a possible breach occurs, a calling mechanism is used to warn consumers by mobile phone. Because almost everyone has a smartphone these days, customers will not need to carry an additional device to keep an eye on their house if they utilize this system. This system is developed with modularity in mind to be a flexible system that can add more sensors without having to replace the entire system; instead, only a few sensors can be added to extend the system's capabilities. In a nutshell, this system is a modular home security system that communicates with the user via a call function. The project model may be used in a number of situations, including banks and businesses. It is now feasible to handle theft strategies that differ depending on the location and kind of goods. Modern technology has entered all regions, making it simple to minimize theft potential in a number of

ways without spending a lot of money. A microcontroller was used to build a home security and reliability system.

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