

## Design and realization of motion detector system for house security

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### Abstract

*In this paper, the design and realization of motion detector system for house security based GSM network is presents. The development of microcontroller carried out intruder detection that supports tracking techniques to provide vital security with control and alert operation inside and outside the home. The pivot of security on the integration the motion detector and cameras into web applications has become more interested. The smart surveillance Pi camera obtain the input from the motion detector and controller which is send the video to the web server allowing the homeowner to access this video by use web applications. An intrusion alert send to the owner by mean of message via mobile and buzzers alarms located at suitable distance. This system is typify proficient video camera for remote sensing and tracking with live video for succeeding play again to offers efficient and easy implementation with omnipresent surveillance solution.*

**Keywords:** home security, motion detection, Pi camera

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### 1. Introduction

The security level in the home becomes more important and enhanced system always [1]. Many security techniques have been enhanced such as the sophisticated weapons, security officers, alarms and others were produced the software and electronic hardware integration [2]. The home security is one of the most important safety systems which are required for all social groups [3]. Any home need to be monitored at all time from fire, theft and short circuits cases. In existing time, the rate of crimes include murder, fire and robbery is increased and worrying the hum. Therefore, house surveillance system should be improved to be more valuable. Nowadays, developer and researchers come up with wide range of security systems that are deployed at houses in remote area and industrial in same time [4]. A number of these studies have realized and other is in progress. A combination of software and hardware is the main task in security system that protects the properties and life in commercial building and residential place from interruption [5]. The idea of security design comes after perceived that the value of life could be lost through fire or robbery without prior warning data [6]. With time, the security systems have developed from simple control to high technological methods [7]. By using Arduino kits, the GSM based house security system has been proposed by [8]. Low cost smart security Pi camera with nigh vision capability with passive infrared sensor has suggested by [9]. Numerous techniques of home security development and investigation have been subjected as in [10-37]. An automatic control and efficient power consumption security system has been proposed by [38] as show in Figure 1. In this work, many techniques were used to provide effective algorithms security system which is realized using python script as illustrated in Figure 2.

### 2. Security System State Flow Model

The house alarm system include sensors, event, motions and all system activities has been designed and running in MATLAB as showing in Figure 3. In this design, when the system detects an intrusion permit a certain time for alarm to be disable and otherwise calls the house owners. This system illustrates how to use output events to derive all blocks and how to use direct event broadcasting to coordinate between parallel states. Additionally, this model could

show how to use the function call trigger to simulate the security system which required to be every so often triggered.

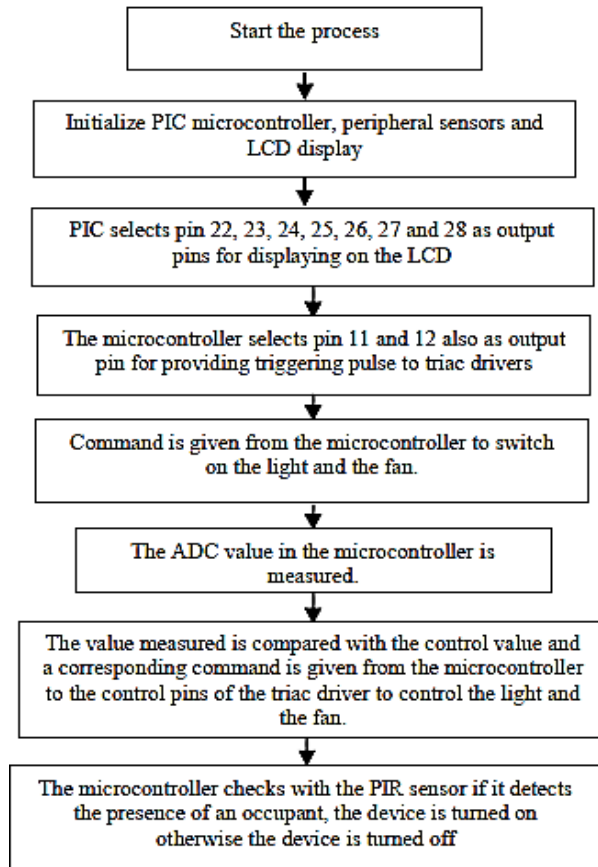


Figure 1. Human movement detection [39]

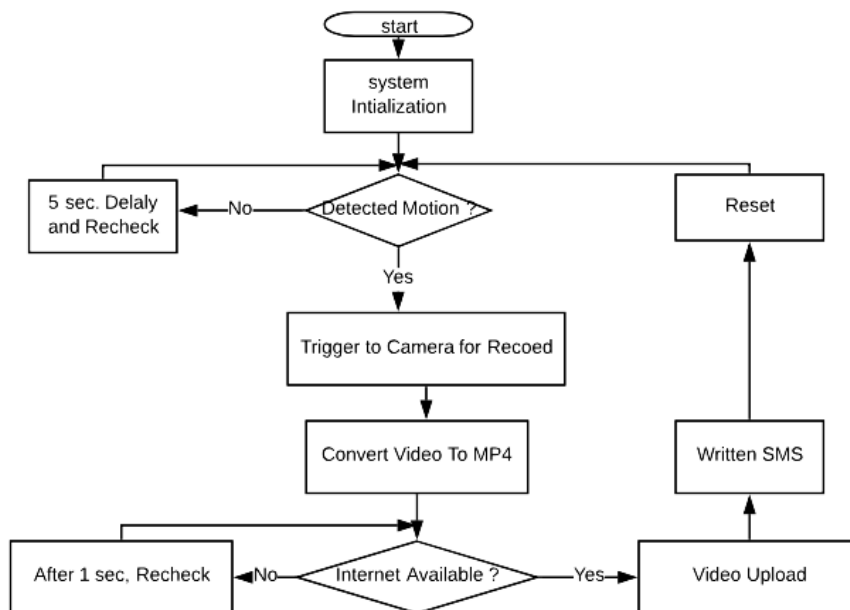


Figure 2. Flow chart representation of the proposed security system

Figures 4 and 5 show the door and window state status which is variable at each update. Hence, if the sensor variable is true, the broadcasting event is sent to alarm condition and when the sensor is active, the alert events could broadcast, otherwise, the warm event is broadcasting. The motion sensor event illustrated in Figure 6 represents the input from this sensor which could be sporadic, and then the de-bouncing state is used. The state of de-bouncing remains active while motion sensor is true and after certain delay duration, the alert event could broadcast. In case of an alert event is broadcasted to the alarm state, the pending state will be activated for delay duration. If the disable of alarm is not established through the delay duration, then the house owners is directly contacted by the output event. Figure 7 shows the alarm activity state flow model.

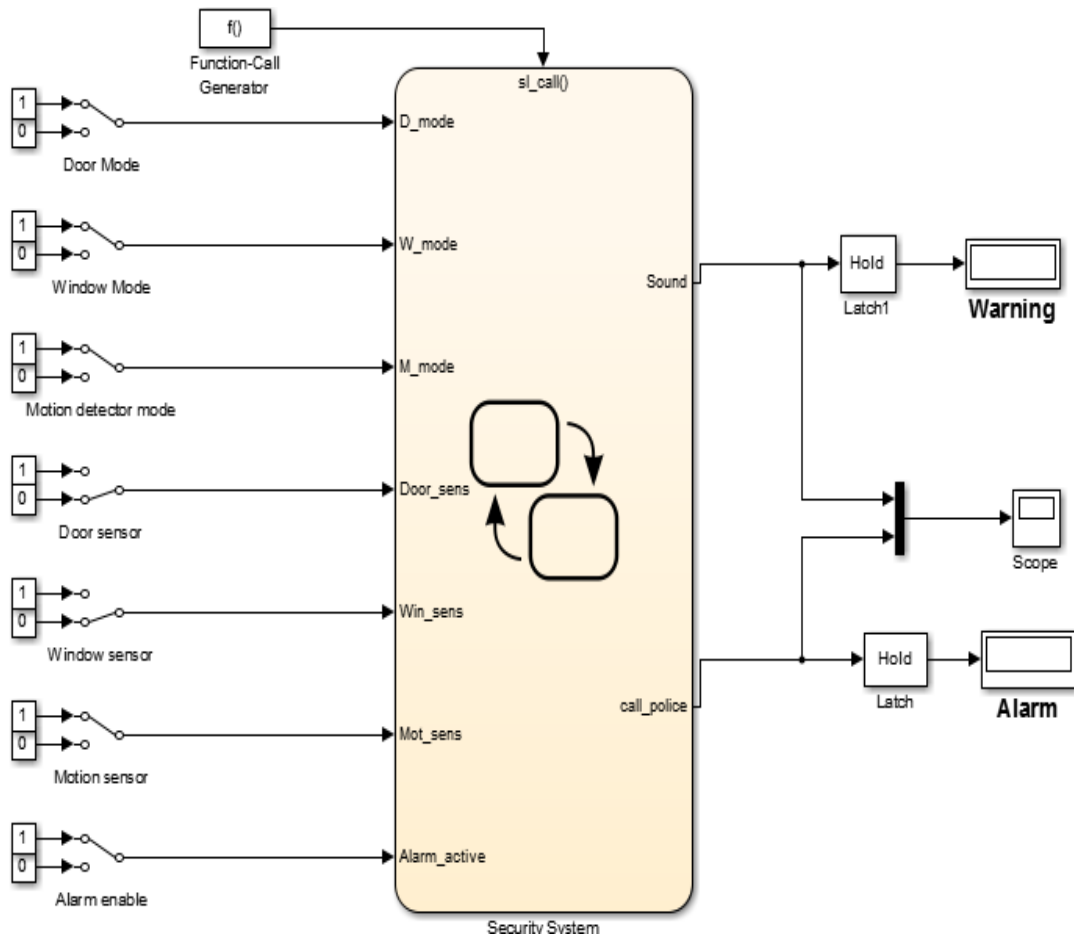


Figure 3. House security state flow model

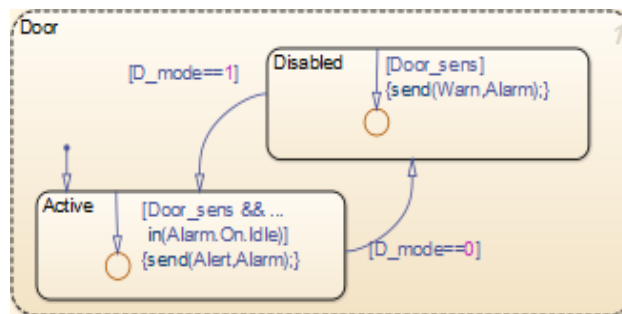


Figure 4. Door/window activity state flow model

### 3. Results and Discussion

To achieve the goal of house security system, the software and hardware parts in the proposed system are combined and implemented in MATAB. The hardware equipments used to performs the surveillance possibility, while the software part drives the operations and enabling all functions of connected components. To ensure the house security with minimum cost, the installation of surveillance system is based software via GSM network. The sensor sensitivity is installed at 15 meters to enhance the system operations by careful locations of Pi camera and sensors. Figure 8 shows the system triggers over all time in yellow color line. The locations of sensors is setup in such a way that interloper walk across the field of vision improve the performance in motion discovering as compared with locations in case of interloper walk straight towards the sensors. Any movements within 15 meters will realize by Pi camera and captured. The controller programs required for video record and transmitted to the server of the web. In case of motion was detected by sensor, the program enable Pi camera to capture and save the images. The alerts of the system to the house owners about any intrusion around the house could be sent via GSM network which is refer the house members to the web applications to watch the video recorded by the system. In this instant, the house members could take the required steps to overcome any further damage to the properties.

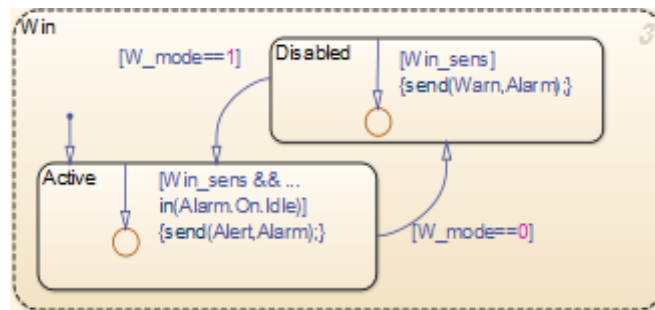


Figure 5. Window events state flow model

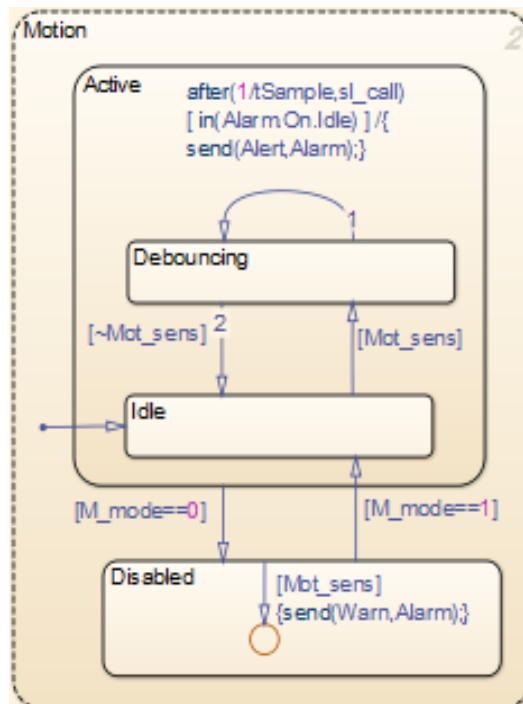


Figure 6. Motion sensor state flow model

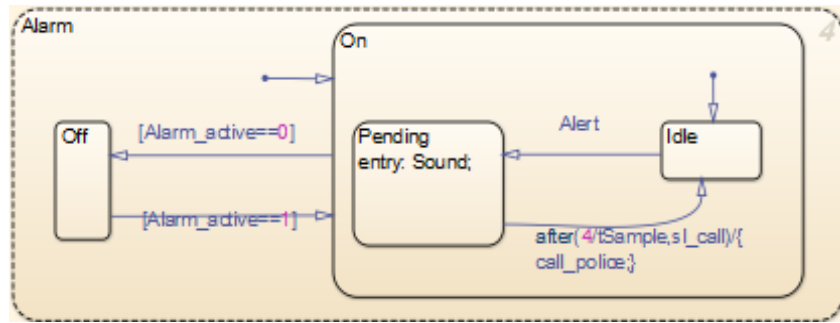


Figure 7. Alarm activity state flow model

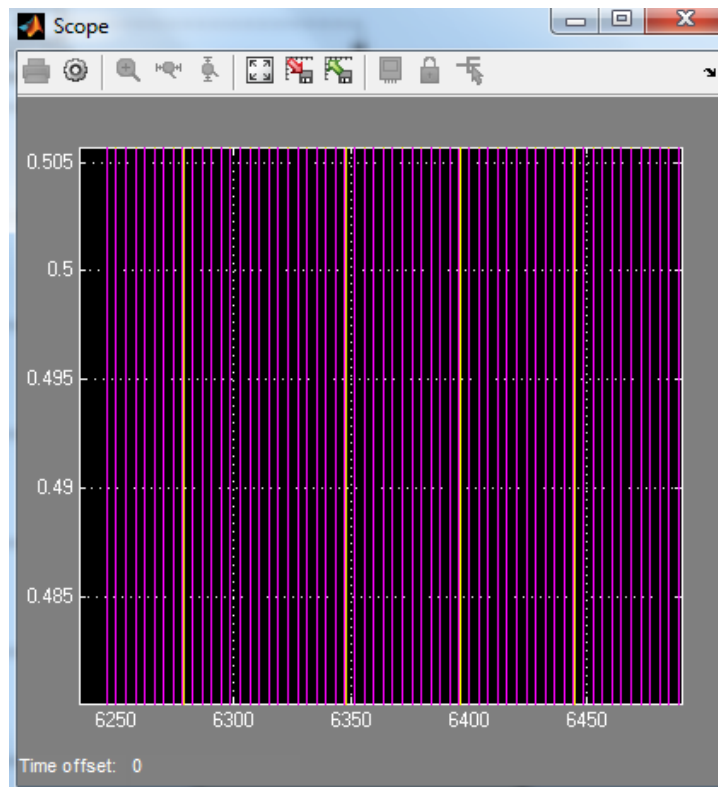


Figure 8. Triggers of security system

#### 4. Conclusion

This work introduces advance security system for house safety with development alertness of importance security in home owners, workers, residential and commercial building are on the lookout for effective surveillance system. The intrusion detection into the office or house is made possible using passive infrared sensors which use the radiation that alert any human motion across the movement. The suggested design is power efficient and particularly applicable in locations with low power consumption. It's absolutely challenging to have implementation of this work with incredible application and possibility. The full automation realization in real time system might be occupied and biometric scanner that provide monitoring and security tasks. This will make it feasible for house owner to have interval that their belonging are protected. To provide more effective and sensitive sensor is suggested for enhanced performance.

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