iJRASET
International Journal For Research in
Applied Science and Engineering Technology

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 2 **Issue:** X **Month of publication:** October 2014

DOI:

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International Journal for Research in Applied Science & Engineering Technology(IJRASET)

A Review on Embedded Security System

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Abstract- Security system was implemented more than years ago, but only today are the conditions united for mass application of this technology. The customer require simple, reliable and high performance core system. In recently the system design with high resolution camera and built up with different sensor and also provide Internet service for global access for databases. In this review paper; we survey the current work on security system and application. We examine the existing work, which is held by ultrasonic sensor to inform any intruder passed through the surveillance region, PIR (Pyroelectric Infrared) sensors for activities observation i.e. for motion detection with the help of majority voting mechanism and monitoring alarm system, which is commonly used. This review contributes to better understanding of the challenging in existing work on security system and further research direction.

Keyword- Automatic latch, embedded system, Monitoring Camera, PIR sensor, Ultrasonic sensor

I. INTRODUCTION

Security system is now a crucial part for any Banks, organization and for home where we can monitor for 24 hours and provide necessary activities information. Security systems involve the use of various device, techniques and sometimes-human force to protect individuals and property from various hazards such as fire, crime and loss. The available security systems can be classified into various types, which, however, often overlap with one another. However, since most of the available security systems are focused on protection from a specific hazard. A monitored system alarm is one of the commonly used security systems. This system will alert a call centre if the alarm is triggered and this call centre will contact the police. Nowadays security system is most important for image detection [II]. It is essential that any organization privacy is protected always and no outsider can affect it by any means. Some researchers use embedded system for image processing or analysing [III]. In the last past year the implementation of security system was increase rapidly and technology terms are added with system day by day. In electronics terms cameras for monitoring the activities that is video streaming did the first way of security system or capturing image and then system include some circuits to improving the security. In a system first added motion sensor that make camera to move with person movement and capturing the image and then embedded board was added on security system that makes not only capturing the image but also processing that image for further actions, this all process are done by camera. As we know surveillance system for public area covers large area so that additional sensor was added out of the camera to cover large area and consuming power, for this PIR sensors was added to find any intruder enter in the surveillance area by change in room temperature or any motion [II]. The PIR sensors sense any object, animals and humans body Single PIR sensor has high miss rate in sensing [II] will decrease the reliability of the security system so that modules added numbers of PIR sensors that reduce the high miss rate[IV]. Recently system added ultrasonic sensor, which make simple and reliable security system this sensors are judge by majority i.e. majority, voting mechanism [II].These sensors are also sense intruder pass through the security region. The ultrasonic sensor provide transmitter and receiver section where ultrasonic transmission will spread the frequency at beam angle [III] and receiver part receive that frequency, if any intruder passed through this sensor which cause blocking the transmitted frequency i.e. frequency not receive by ultrasonic receiver where we can identify that human body passes through the security region. For enhancing the sensing probability the numbers of receivers required in line direction at receiver end [III] [IV].

II. HUMAN DETECTION AND MONITORING

The human activities detection and monitoring is crucial part for any kind of security system that is make distinguish between authorized and unauthorized person from its database. A monitored system alarm for security system is one of the most commonly used alarm systems. This system will alert to authorize person if the alarm is triggered and this person will contact the police for further action. Monitoring action are captured by high sensitive camera and process by embedded system for further action

Different sensors like Microwave detectors hold the existing work for detection of human body or any objects and animals, Photoelectric beams, Vibration (shaker) or inertia sensors, PIR sensor, ultrasonic sensor and motion detection sensor. The system uses ultrasonic sensor that has a transmitter part and a receiver part. The ultrasonic transmitter periodically emits ultrasonic signals into an open area in front of it. To cover a wide range. If the signal ever hits a physical object, it will be reflected back and, the receiver part of the sensor will then capture it with the object considered detected as its position.

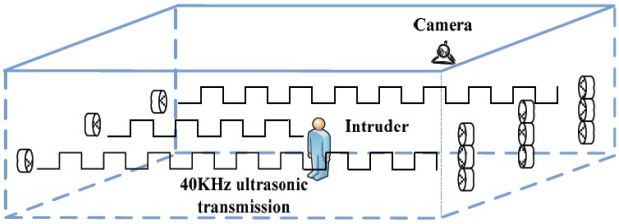


Figure. 1: Experimental Environment

Figure. 1 shows we place the ultrasonic sensors on the walls around the room [III]. The ultrasonic transmission will be blocked when an intruder enter into the transmission path of the sensing area. The distance between the transmitter and the receiver is 6 m. It including an LED, which is turned on/off according to whether the receiver receives an ultrasonic signal or not.All objects with a temperature above absolute zero emit heat energy in the form of radiation. Usually this radiation is invisible to the human eye because it radiates at infrared wavelengths, but electronic devices designed for such a purpose can detect it. It is important to note that PIR sensors do not detect or measure "heat" per se; instead, they detect the Infrared radiation emitted from an object, which is different from but often associated/correlated with the object's temperature. A PIR-based motion detector is used to sense movement of people, animals, or other objects.

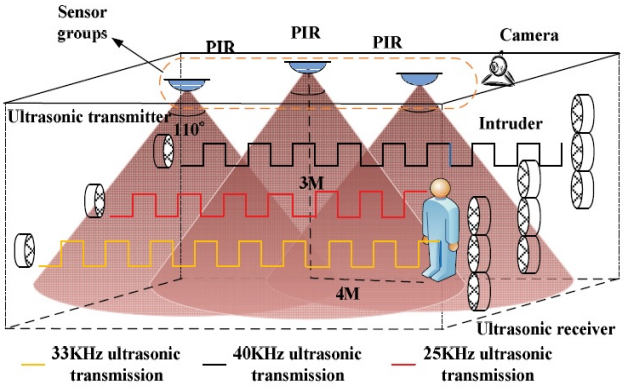


Figure. 2: Experimental Environment

Figure. 2 shows the experimental environment [II] [III]where we placed the numbers of pairs of PIR and ultrasonic sensor in surveillance area for detecting any movements or observing any activities in a room by intruder, if they find it capture by camera and uploaded by embedded system [II] [III].

III. PROPOSAL WORK

A. Sensing loop

Figure. 1 shows the sensing loop that makes simple and reliable security system as a watch dog by installing the wiring around the building. You have to stretch the loop wires two feet above the ground to sense the unauthorised entry into your premises. Wire loops 1, 2 and 4 are connected to inputs of 7-segment display decoder. The loops are also connected to a dual 3-input NOR gate and inverter activate the alarm. A common-cathode, 7-segment display is used for displaying whether the loops are intact or not. If loop 1 is broken, the display will show ‘1’. If two or all the three loops are broken, the display will show the sum of the respective broken loop neatly. The loops are also connected to a dual 3-input NOR gate and to activate the alarm.

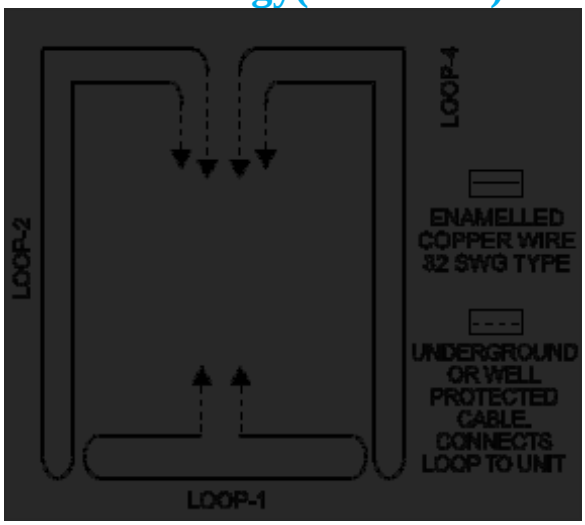


Figure. 1: The proposed Sensing loops diagram

B. Automatic Door Latch

Home security system for automatic doors provides advance security of today's standard for homeowners. It will be used to closed the home doors automatically just by receiving activating signal from sensing loop to closed the next door. In this design, we worked to create a security system, which is utilizing embedded technology to sense signal at the doorknob for automatic door lock purposes. This system is also connected with servomotor to perform a function of physical. This type of systems can be used in any type of doors and gates for high class and fastest accessible security with ease of use.

IV. DISCUSSION

While survey on existing work on security system we find some drawback or problems that is we cannot stop robberies which is in progress because camera just capture footage (so were we can receive justice in court), also it is useless in police investigation when they are hide their identity while doing misdeed if the perpetrator is masked so that the capture footage picked by camera can be useless in police investigation To stop robberies we will move for physical action that's done by creating some delays for rob and harm that unauthorized person by infecting gas for fainting human body. To create some delay we will use sensing loop and automatic door latch, which work as road breakerto burglar by locking next way doors and windows. PIR sensor miss rate will be rectify by use of multiple sensor and adding focus point on ultrasonic sensor increase the sensing probability

V. CONCLUSION

Embedded security system is important research area where we see the state of the art ofexisting method that observe the activities and sense movements in security area. At the end of the survey we discuss on further direction such as sensing loop and automatic door latch to make physical action.

VI. ACKNOWLEDGMENT

I would like to thank the Prof. Shubhangi Borkar reviewers for their valuable comments and suggestions to improve the quality of the paper. Iam also grateful to Prof. Tirupati M Goskula for improving the numerical aspects.

REFERNCES

[1] S.C. Chan,Member,IEEE, Shuai Zhang, Jia-Fei Wu, Hai-Jun Tan, J. Q. Ni, and Y.S. Hung,"On the Hardware/Software Design and Implementation of a High Definition Multiview Video Surveillance System"IEEEjournalonemergingandselectedtopicsincircuitsandsystems,vol.3,no.2,june2013

[2] Ying-Wen Bai, Li-Sih Shen and Zong-Han Li, "Enhancement of the Reliability of an EmbeddedSurveillance System by Multiple Sensors Using aMajority Voting MechanismI2MTC 2009, May 2009 singapore pp.5-7

[3] Ying-Wen Bai, and Li-Sih Shen, "Enhancement of Sensing Probability and Sensing Range of an Embedded Surveillance System by Use ofMultiple Sensor Groups Incorporating a Majority Voting Mechanism," IEEE International Symposium on Consumer Electronics, June, 2009, pp. 801-805.

[4] Ying-Wen Bai, Li-Sih Shen and Zong-Han Li, "Design and Implementation of an Embedded Home Surveillance system by use if multiple ultrasonic sensor," IEEE International Symposium on Consumer Electronics, February, 2010, pp. Vol.56, No.1.

[5] Xiangjun Zhu, Shaodong Ying and Le Ling, "Multimedia sensor networks design for smart home surveillance," Control and Decision Conference, 2008, Chinese, 2-4 July 2008, pp.431-435.

[6] Wen-Tsuen Chen, Po-Yu Chen, Wei-Shun Lee and Chi-Fu Huang, "Design and Implementation of a Real Time Video Surveillance System with Wireless Sensor Networks," VTC Spring 2008. IEEE Vehicular Technology Conference, 11-14 May 2008, pp. 218-222.

[7] Jun Hou, Chengdong Wu, Zhongjia Yuan, Jiyuan Tan, Qiaoqiao Wang and Yun Zhou, "Research of Intelligent Home Security Surveillance System Based on ZigBee," International Symposium on Intelligent Information Technology Application Workshops, Shanghai, 21-22 Dec.2008, pp. 554-57.

[8] Hui Li and Dong C. Liu, "An Embedded High Performance Ultrasonic Signal Processing Subsystem," *International Conference on EmbeddedSoftware and Systems, 2009. ICESS '09*, pp.125-130, 25 27 May 2009.

[9] Hai-Wen Zhao, Hong Yue, and He-Gao Cai, "Design of a Distributed Ultrasonic Detecting System Based on Multiprocessor for Autonomous Mobile Robot," Proceedings of the 2007 WSEAS Int. Conference on Circuits, Systems,Signal and Telecommunications, Gold Coast, Australia, January 17-19, 2007, pp. 59-64.

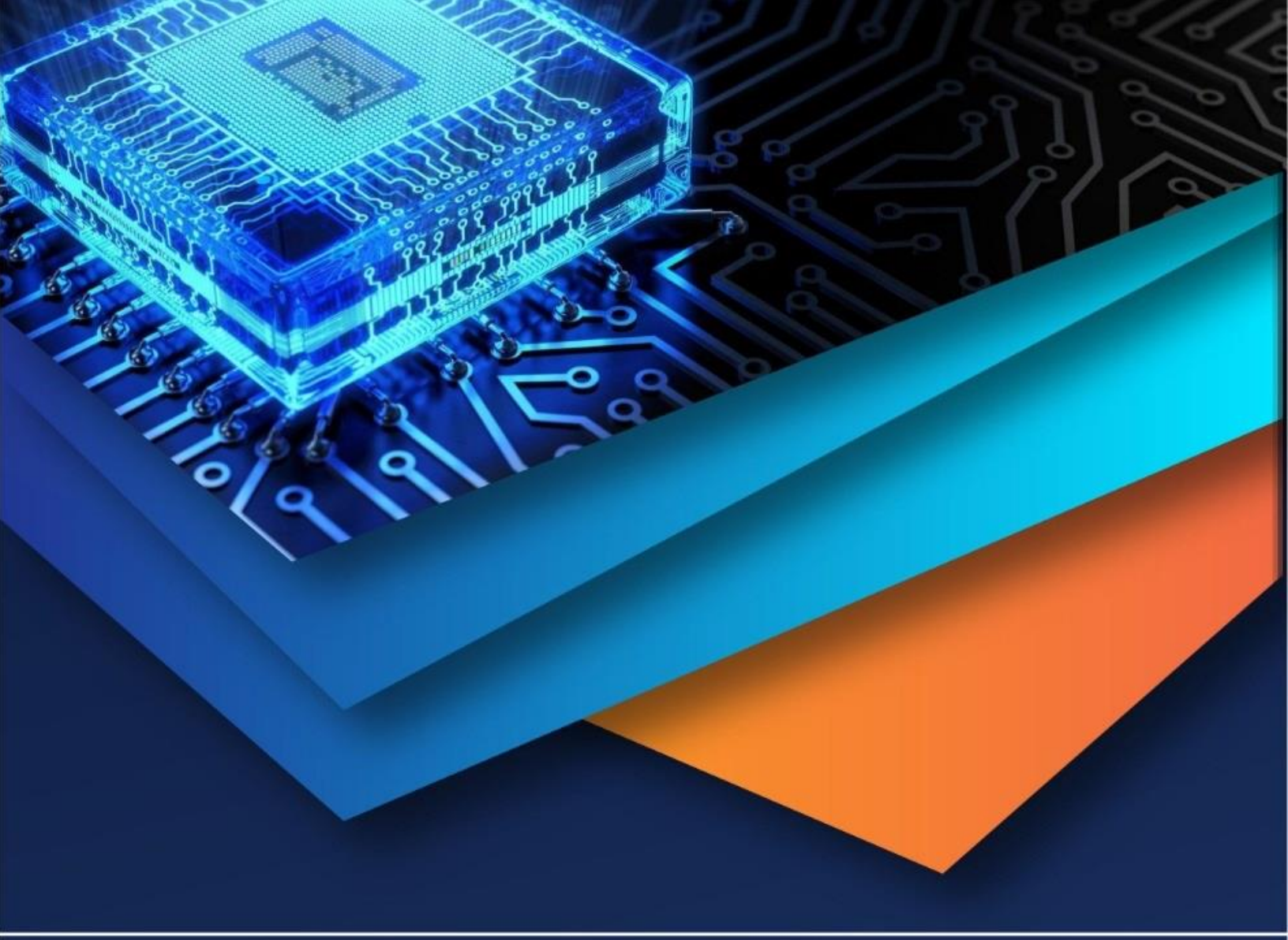
[10] Johann Borenstein and Yoram Koren, "Error eliminating rapid ultrasonic firing for mobile robot obstacle avoidance," IEEE Transactions on Robotics and Automation, Vol. 11, No. 1, pp 132-138, Feb.1995.

[11] Francesco Alonge, Marco Branciforte, and Francesco Motta, "A novel method of distance measurement based on pulse position modulation and synchronization of chaotic signals using ultrasonic radar systems," IEEE Transactions on Instrumentation and Measurement, Feb. 2009, pp. 318-329.

[12] Weiming Hu, Tieniu Tan, Fellow, IEEE, Liang Wang, and Steve Maybank, "A Survey on Visual Surveillance of Object Motion and Behaviours," IEEE transactions on systems, man, and cybernetics—part c: applications and reviews, vol. 34, no. 3, august 2004

[13] I.Yugashini, S.Vidhyasri, K.Gayathri Devi, "Design And Implementation Of Automated Door Accessing System With Face Recognition,"International Journal of Science and Modern Engineering (IJISME), November 2013 Vol.1,Issue-12,10

[14] Mahasak Ketcham, Thittaporn Ganokratanaa, Sriphagaarucht Srinhichaarnun, "The Intruder Detection System for Rapid Transit using CCTV Surveillance Based on Histogram Shapes," 2014 11th International Joint Conference on Computer Science and Software Engineering (JCSSE)



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