

# Intrusion Detection System for Smart Home using Laser Rays

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*Abstract*--- Now-a-days security is one of the major issues for home environment. Smart home security is important as the intrusion is increasing very drastically for home. Safeties from theft, damage to resources and leakage to sensitive information are to be handled in a very smart and secure way. The traditional security system uses some form of an alarm signal to detect the intrusion. In recent times, companies have invested considerable amount into home security systems. To handle this problem we propose and implement alarm systems involving light dependent resistors as the main component. In this paper, a circuit has been developed and tested using a light dependent resistor.

## I. INTRODUCTION

Automated home or intelligent homes which are the other names of smart home-indicates the automation of electrical appliances used in smart homes. It could be viewing of house interiors for surveillance purposes, controlling home appliances or generating an alarm in case of accident like leakage of gas, smoke detection and intrusions.

The technology about home security has increased a lot as compared to the last century and will be increasing in the coming years. Among all the smart home applications, security has become an important aspect. A convenient, comfortable and safe environment has to be provided to overcome intrusions using new and emerging concepts. Conventional security system keeps house owners safe and secure from the intruders by giving indication through alarms.

So far, many technologies have been developed such as image processing technology (detection) and some intruder detection technologies (by using communication). This security system that has been developed using a simple circuit (prototype) is an affordable one. Components such as LDR, transistor and LASER (IR rays)-light source, have been used. It can be installed in the premises of our smart homes near walls and doors. It can also be installed in museums; to secure valuable things. This security system project can also be extended by linking it to Wi-Fi and sending a signal to the nearest security hub to generate an alarm.

## II. LITERATURE REVIEW

According to the market research, the common parameters or characteristics of home security system are

- 24 hours monitoring of the intruder
- Ease of use
- Reliability
- Efficient

Fast and precise notification system. Today a number of home security systems are available in market.

In paper [1] a design which contains a home network including a GPRS/GSM gateway and three kinds of wireless security sensor nodes is presented. This system has a user interface and it can respond quickly to alarm incidents. In paper [2], a new method of moving object/body

detection by combination of pixel illumination with its Chroma in YUV colour space is made implemented. The algorithm of maintenance with 3 key values is discussed in this paper. In case of swaying objects, it is very robust and effective way of false alarms.

Paper [3] discusses the detection and description based on an object oriented, statistical multi feature analysis of video sequences. The system described in [4] monitors everything by moving cameras. The system can increase the efficiency of monitoring and can eliminate the blind spots of fixed cameras. In this system, a mobile manipulator is developed which is equipped with cameras at the arm end for purpose of monitoring. The system is based on SMS technology using any GSM modem/mobile is presented in [5].

The proposed remote control system works from anywhere in the world. A low cost Short Message System (SMS) based home security system equipped with motion sensor, smoke detector, temperature sensor, humidity sensor and light sensors has been studied in [6]. The sensors are controlled by a microprocessor PIC 18F4520 through the SMS having password. As mentioned earlier about security systems, there are more advanced security systems, like image processing security system and communication based security systems.

As mentioned above there are two home-security network systems and according to its operating function we could divide into cabled system and wireless system. In literature [7] mainly explored the methods for conducting data transmitting with power lines in home environment. In spite of the less expenditure and easy construction, the transmitting quality was easily disturbed by noise, therefore, the method would be difficult to keep the data complete and accurate and cause problems in safety. In literature [8] mainly explored the methods for constructing home-security network with TCP/IP standard communication protocol layout of wires of which was too complicated to meet the demand for modern home.

## III. PROPOSED METHODOLOGY

This device works on the basis of interaction between the sensor (which is LDR) and light source, preferably a LASER. When light is incident upon the LDR that is connected- the resistance would below, which directs a high input current through the base of the transistor, which in turn gives a low output which is accepted as an input into the buzzer.

Note that the transistor here, works as a NOT gate as shown in Fig1. When an intruder steps between the light source and the LDR, the resistance of the LDR becomes up to 1 mega-ohm. This directs a very low amount of current into the base of the transistor as an input, which in turn gives a high output. This is the one which is accepted as the input by the buzzer, which gets activated and produces a sound

which is considered as the signal of the intruder alarm system.

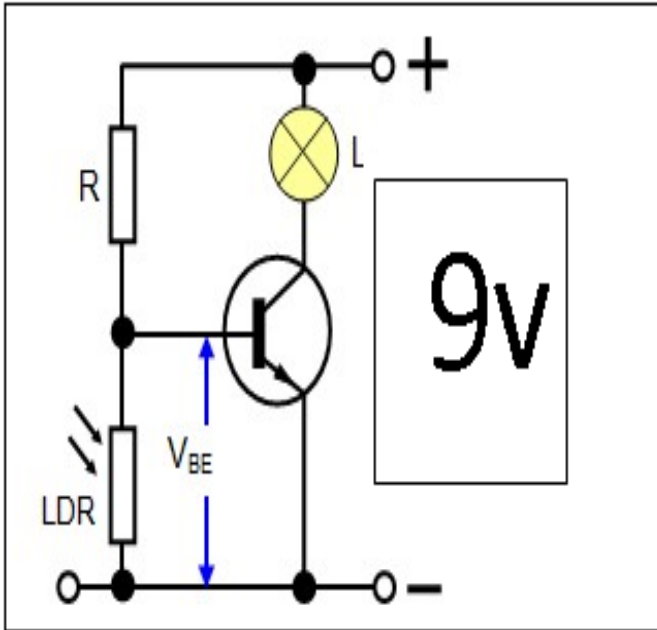


Fig. 1: Circuit Diagram



Fig. 2: Overview of Smart Home

Here in the circuit shown one end of the wire is connected to the negative terminal of the battery and the other terminal to the LDR in the circuit. The emitter of the transistor also connects at the same point of the contact. Here in the circuit made the positive terminal of the battery and the positive terminal of the buzzer and the resistor are connected in series. The end from the collector of the transistor and the negative terminal of the battery are combined and are connected to the buzzer. The input wire is connected to potentiometer of the circuit as shown in Fig3.

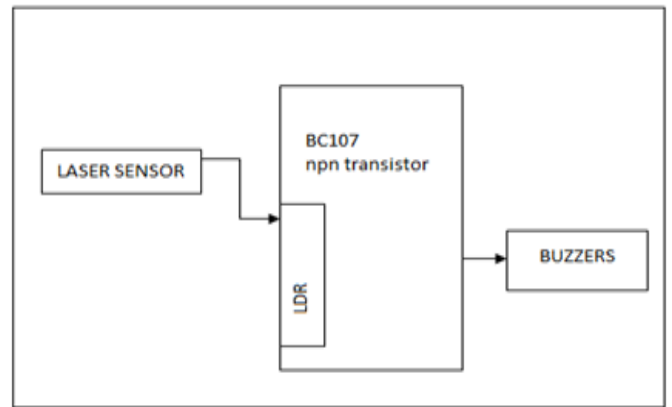


Fig. 3: System Architecture

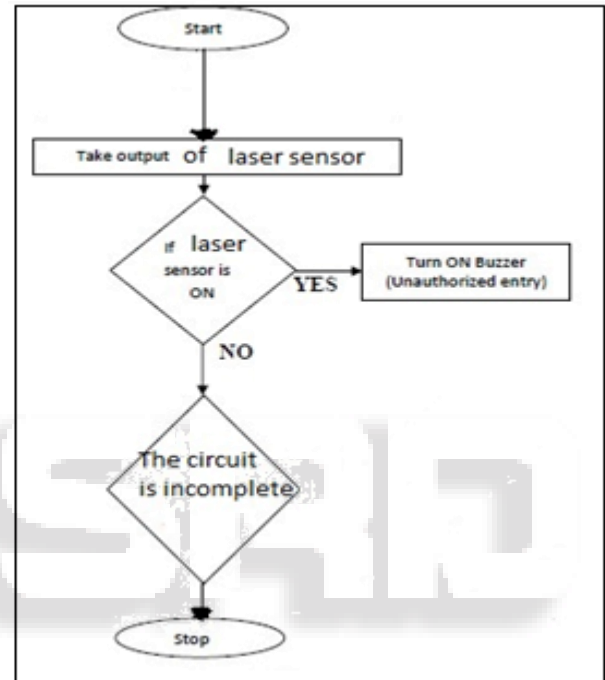


Fig. 4: Flow Chart of the system

#### IV. RESULTS AND DISCUSSION

The proposed system is tested on the model of the smart homes(which is as shown in the above discussions).the laser rays using Wi-Fi technology based security system detects the motion of intruders and sends SMS to the nearby police station. This system is more convenient and easy to use. This system can also be developed with the latest improvements in the technology.

The developed laser based security system gives good response to the sensor and sends SMS when it detects the intruders entering the house premises. The time taken by the system to deliver the SMS is dependent on the coverage area of the range of the specified mobile network. If the mobile is in the range of the system then the SMS is delivered in 25-30 seconds.

##### A. Advantages of the proposed system:

1. There is no need to have extra circuitry to transmit SMS as the system is SMS based.
2. The proposed system is very cost efficient.

##### B. Drawbacks of the proposed system:

1. There are also some places in the world where the mobile network is not established so the connectivity of

mobile phones in that area is not possible. Therefore the SMS cannot be sent

#### V. CONCLUSION

Nowadays, in our daily life the home-security system was popularly adopted, but in most occasions the security system was usually occupied or organized by big insurance companies or specific security companies. That means users need to pay higher money for management fee to protect the safety of their own houses. In this paper we develop another home-security system combining with some brand-new technologies such as wireless sensor network. This security system has been tested under many conditions and has given a satisfactory result and has proved to be very efficient. Some improvements in its technical and aesthetic design can be expected in the future.

#### REFERENCES

- [1] The-History-of-Home-Security 4th July 2010 [Online]. Available: <http://ezinearticles.com>.
- [2] V. Karri and J. S. Daniel Lim, "Method and Device to Communicate via SMS After a Security Intrusion", 1st International Conference on Sensing Technology, Palmerstone North, New Zealand, (2005) November 21-23.
- [3] Y. Zhao and Z. Yet, "Low cost GSM/GPRS BASED wireless home security system", IEEE Trans. Consumer Electron, vol. 56, no. 4, (2007) January, pp. 546-567.
- [4] Z. Bing, G. Yun hung, L. Bo, Z. Gangway and T. Tina, "Home Video Security Surveillance", Info-Tech and Info net, 2001, Proceedings, ICII 2001-Beijing. 2001 International Conference, vol. 3, pp. 202-208.
- [5] M. Meyer, M. Hotter and T. Ohmacht, "A new system for Video-based Detection of moving objects and its integration into digital networks", Security Technology 1996, 30th Annual 1996 International Carnahan Conference, (1996), pp. 105-110.
- [6] Mae , Y.; SaaS , N .; Inonu ,K .; Await.; "Person Detection by Mobile Manipulator for Monitoring",SICE 2003 Annual Conference, pages-2801-2806.
- [7] V. Chunduru and N. Subramanian, "Effects of PowerLines on Performance of Home Control SystemPower Electronics, Drives and Energy Systems,"Proc. of International Conference on PowerElectronics, Drives and Energy Systems, Delhi, India,2006, pp. 1-6.
- [8] I.K. Hwang and J.W. Baek, "Wireless AccessMonitoring and Control System based on DigitalDoor Lock," IEEE Transactions on ConsumerElectronics, 53(4), 2007 pp. 1724-1730.