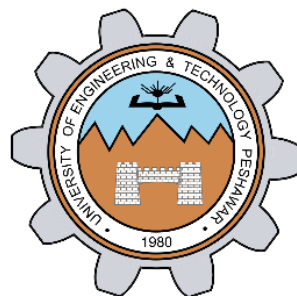# SMART SECURITY SYSTEM

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Introduction

In this modern world, Analog Electronics devices are becoming less popular and digital electronics components are becoming more advanced and popular day by day. Smart security system is also an example of modernized digital world. The basic concepts of this project is to ensure the security system of homes, bank vaults, offices. It is also used in many electronics projects among engineering students and also very popular in industry.

Motivation of our Project

Security is a most important factor today. Technology develops day by day in the world. The crime gang also improves their technology toper form their operation. So technology of security should be modern with time to protect the crime works. We decide to make a security project as our project. In this project we have used laser light to cover a large area. We know laser light goes through long distance without scattering effect. It's also visible only at source and incident point, otherwise invisible. These two properties help us to build up a modern security system, which may name as "laser security". When any person or object crossover the laser line the security alarm will ringing and also the focus light will "on" to focus the entrance of unauthorized person. We can make a security boundary of single laser light by using mirror at every corner for reflection. Our project provides complete information on the topic "Laser Security Alarm System" and maximum efforts have been taken to make the project more comprehensive and lucid to understand. Our project covers a variety of sub topics like its working, setup, uses in life and different aspects of Laser Security Alarm System**.**

OBJECTIVE

The objective of this project is to develop a modern security system, in which the laser security uses to ON the buzzer in the case of entry intruders during the absence of the owner. Laser door alarm is based on the interruption of Laser beam. The laser pointer is used as the source of light beam. If somebody tries to break the laser path, then an alarm will be generated in a few seconds. Normally laser door alarm circuit will have two sections. Laser transmitter is a laser pointer readily available. This is powered with 5 volt DC supply and fixed on one side of the door frame.

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HARDWARE & SOFTWARE

2.1 Hardware

Hardware is the physical parts or components of the system. In this project work, we've used some hardware Arduino, LDR, Buzzer, Laser etc.

2.1.1 Microcontroller ARDUINO

The Arduino microcontroller is an easy to use yet powerful single board computer that has gained considerable traction in the hobby and professional market. The Arduino is open source, which means hardware is reasonably priced and development software is free. This guide is for students in ME 2011, or students anywhere who are confronting the Arduino for the first time. For advanced Arduino users, prowl the web; there are lots of resources. The Arduino project was started in Italy to develop low cost hardware for interaction design.

Figure: Microcontroller Arduino

Arduino Pins and Jacks:

Power -USB / Barrel Jack: Arduino board needs a way to be connected to a power source. The Arduino NANO can be powered from a USB cable coming from your computer or a wall power supply that is terminated in a barrel jack. In the picture above the USB connection is labeled and the barrel jack is labeled .The USB connection is also how you will load code onto your Arduino board.

Pins (5V, 3.3V, GND, Analog, and Digital): The pins of Arduino are the places where connect wires to construct a circuit. The Arduino has several different kinds of pins, each of which is labeled on the board and used for different functions.

5V: The 5V pin supplies 5 volts of power. Most of the simple components used with the Arduino run happily off of 5 or 3.3 volts.

GND: Full name is Ground. There are several GND pins on the Arduino, any of which can be used to ground circuit.

Analog: The area of pins under the 'Analog In' label (AO through A5 on the NANO) is Analog In pins. These pins can read the signal from an analog sensor and convert it into a digital value that we can read.

Digital: Across from the analog pins are the digital pins (0 through 13 on the NANO). These pins can be used for both digital input and digital output (like powering an LED).

Power LED Indicator : Power LED Indicator Just beneath and to the word "NANO" on circuit board, there's a tiny LED next to the word 'ON'. This LED should light up whenever plug Arduino into a power source. If this light doesn't turn on, there's a good chance something is wrong.

Reset Button: The Arduino has a reset button. Pushing it will temporarily connect the reset in to ground and restart any code that is loaded on the Arduino. This can be very useful if code doesn't repeat, but we want to test it multiple times. Unlike the original Nintendo however, blowing on the Arduino doesn't usually fix any problems.

2.1.2 LDR (Light Dependent Resistor)

A light dependent resistor (LDR) or a photo resistor is a device whose resistivity is a function of the incident electromagnetic radiation. Hence, they are light sensitive devices. They are also called as photo conductors, photo conductive cells or simply photocells. They are made up of semiconductor materials having high resistance. It works on the principle of photo conductivity. Photo conductivity is an optical phenomenon in which the materials conductivity is increased when light is absorbed by the material. LDR's are light dependent devices whose resistance is decreased when light falls on them and that is increased in the dark. When a light dependent resistor is kept in dark, its resistance is very high. This resistance is called as dark resistance.

Figure 1: LDR (Light Dependent Resistor

2.1.3 Laser Diode (LD)

A laser diode or LD also known as injection laser diode or ILD. It is an electrically pumped semiconductor laser in which the active laser medium is formed by a p-n junction of a semiconductor diode similar to that found in a light-emitting diode. It produces coherent radiation that means the waves are all at the same frequency and phase, in the visible or infrared (IR) spectrum when current passes through it. Laser diodes are used in optical fiber systems, compact disc (CD) players, laser printers, remote-control devices, and intrusion detection systems. A laser diode cannot be used for spectacular purposes such as burning holes in metal, bringing down satellites, or blinding aircraft pilots. Nevertheless, its coherent output results in high efficiency and ease of modulation for communications and control applications. A typical laser diode measures less than one millimeter across and weighs a fraction of a gram, making it ideal for use in portable electronic equipment. Most laser diodes require only a few mill watts of power at 3 to 12 volts DC and several mill amperes. Here we use 5 volts LD. Therefore, they can operate using small battery power supplies.
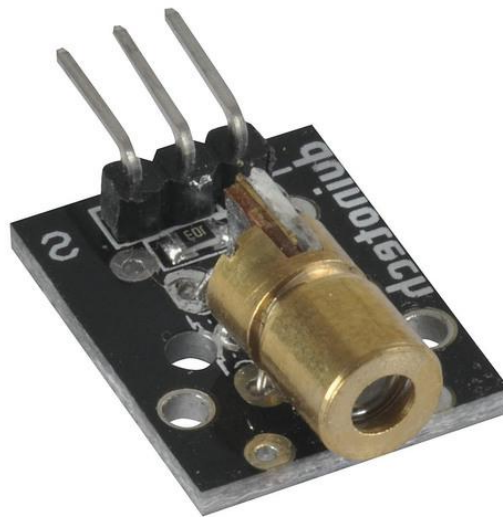

Figure 2: Laser Diode (LD)

2.1.4 Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers, and confirmation of user input such as a mouse click or keystroke.

Figure 3: Buzzer

2.2 Software and Design
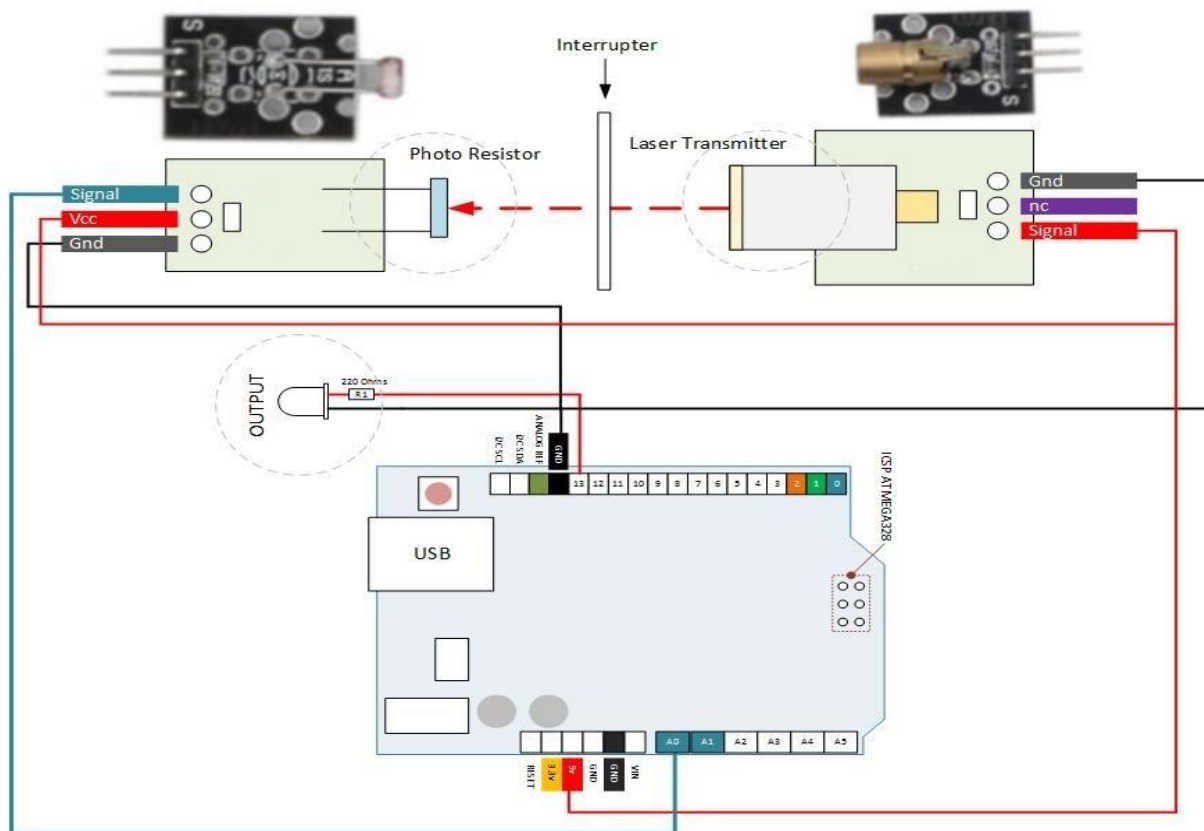
2.2.1 Full Circuit Diagram

Figure 4: Circuit Diagram

2.2.2 Code:

```
int LedOutput = 12;// Define as LED Output Pin 12 you can change this to
                    13 if you dont what pin 12 as output indictor
int SensorPin = 2; // Define as Sensor Pin Input
int Value;       // Define as variable
void setup()
{
pinMode(LedOutput,OUTPUT);//Set as LED output
pinMode(SensorPin,INPUT);//Set as photo interrupter sensor output
                    interface
}
void loop()
{
Value=digitalRead(SensorPin);// Set as sensor read SensorPin
if(Value==HIGH) //If value is equal to HIGH estate then turn LED output
                = high
{
digitalWrite(LedOutput,HIGH); // Set ledoutput to HIGH or ON
}
else
{
digitalWrite(LedOutput,LOW); // Set landoutput to LOW or OFF
}
}
```

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Results & Discussion

3.1 Hardware Results

The model is designed in bread board and all the components are connected as per the circuit diagram. The figures below shows the hardware connection and the output obtained.
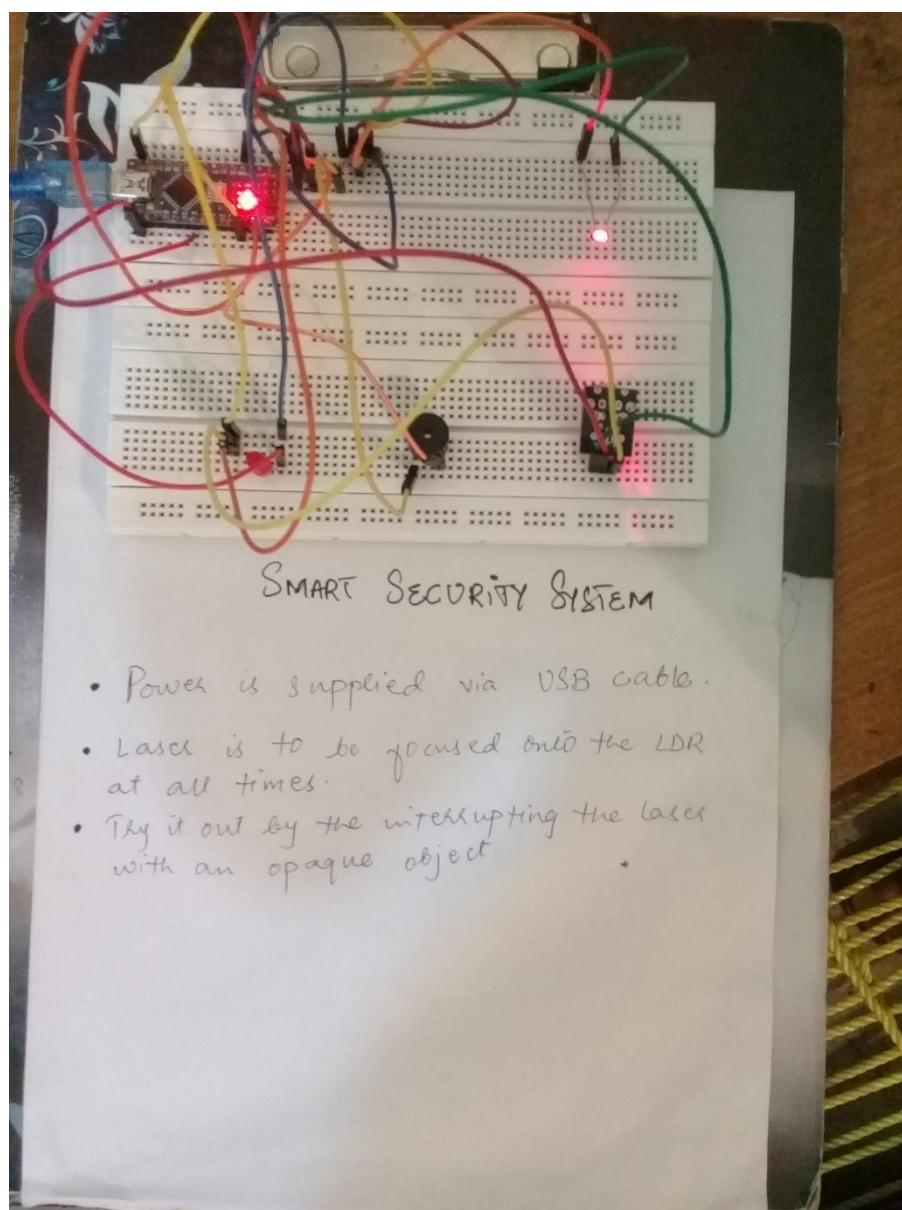
When the laser is not being interrupted:

Figure 5: When there is no obstacle b/w Laser and LDR the LED is off

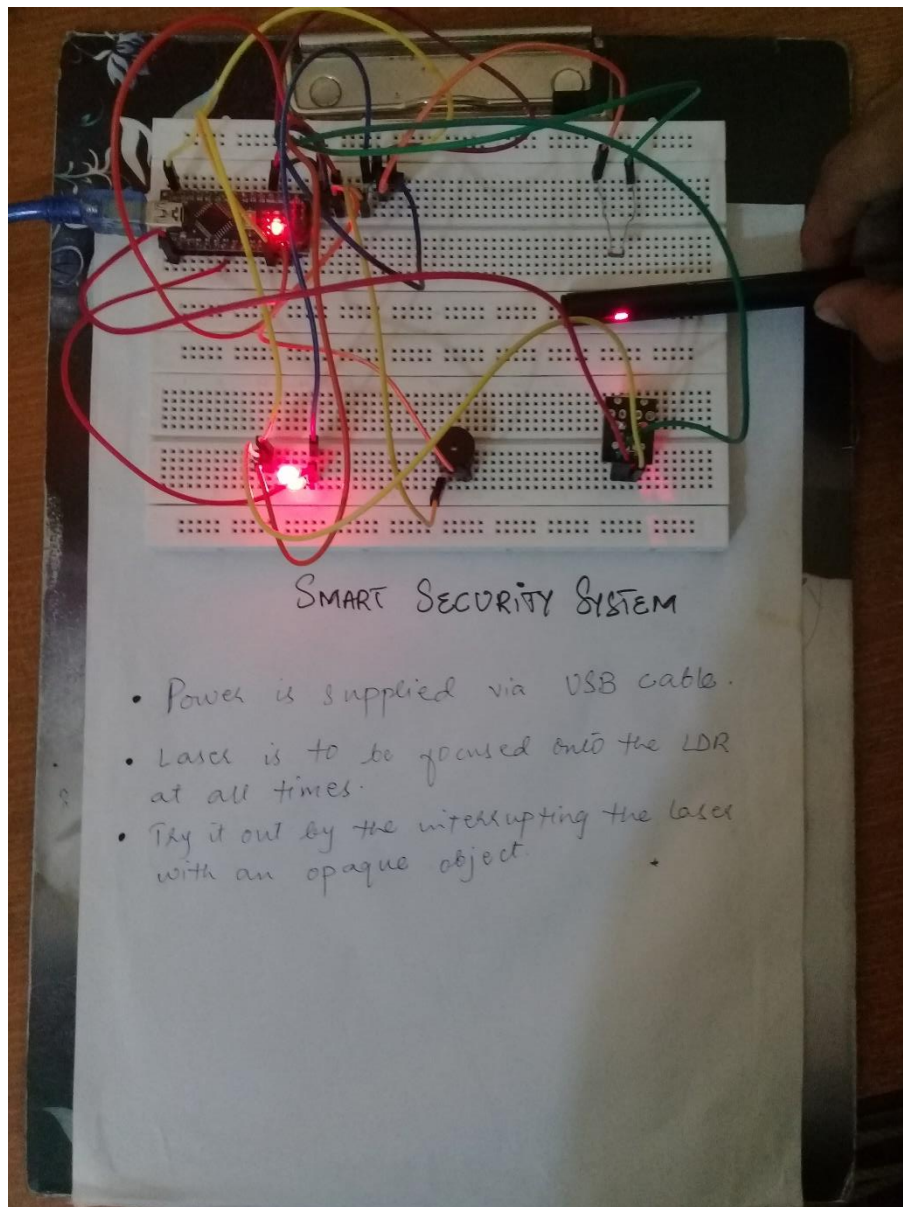**When an object interrupts the Laser beam:**

Figure 6: When there is an interrupter b/w Laser and LDR then LED is on

3.2 Discussion

The combination of the hardware and software give the final design. There were some problems encountered in our project development which can be stated as under:

- Most home laser security systems are made of two parts: a basic alarm unit and an infrared motion detector. Motion detector is not used.
- With the development of operating system this type of security could be hampered.
- Unavailability of components in the local market.
- Coding issues also creates some problems.

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4.1 Conclusion

An electronic circuit is designed that start alarming when anyone interrupt the Laser and monitor a variety of home appliances with interface that can be plugged into GSM modem. The project is successfully developed and met the stated objectives. In addition, the system is very practical when the user is away from the place; through it the user get massage with the electrical device remotely as long as the mobile phone gets the coverage. The Smart Security systems have many advantages. They are simple to install and can be used successfully inside or outside a home. Indoors, the sensors utilize normal power outlets and telephone jacks; outdoors, the sensors can be hidden beneath plants and bushes and will not harm lawns or other plants.

4.2 Future Work Scope

We can upgrade our project by using CCTV high definition camera, Metal detector sensors for safe entry and unsafe entry , finger print sensor for controlling laser security system on/off to stop system hacking and a lots of modification we can do to upgrade this. This project has a lot of upgradable scopes.

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