Topic Selection

IOT Device: Laser Security system using Arduino UNO

1. Problem Domain:

   This project focuses on creating an efficient security system for banks and houses. Since security is an important aspect of life. As time passes, the advancement of technology has created a need for advanced forms of security. Thus, the main problem that will be tried to be solved in this project is creating an advanced and efficient security system.

2. Project as a solution:

   In this project a security system with the use of laser light and buzzer is to be created. The system can be used in one's home or work place or banks wherever valuables might have been kept. Laser light will be utilized to cover a tiny area in this project. Since, laser light has been shown to travel long distances without being dispersed and is visible only at the source and reflecting point and stays invisible through its path. These two traits contribute to the advancement of a modern security system known as "laser security." The alarm is triggered when the laser light is obstructed or disturbed. A secure barrier of single laser light may be established by using a mirror at each corner for reflection. It will be made up of manually switchable sensors and a basic alarm mechanism. Thereby, creating a simple yet efficient security system. On a larger scale, this system of security can be expensive.

3. Tools:

This project utilizes on hardware components more than software.

i. Software:

The Arduino software with C++ languange can be utilized.

ii. Hardware:

a. Laser:

A laser is used to create the laser light required for the security. In this project, it sends a light beam to the LDR, and if it is interrupted, the Arduino will trigger a buzzer.

b. Arduino:

An Arduino monitors its surroundings and changes them by manipulating lights, motors, and other actuators in accordance with the software programmed into it by the Arduino IDE. The Arduino board receives the LDR signal and turns on the Buzzer.

c. GSM Shield:

The Arduino GSM Shield uses the GPRS wireless network to connect your Arduino to the internet. By simply plugging it into your Arduino board and inserting a SIM card from a GPRS-capable operator. The Arduino GSM Shield connects an Arduino board to the internet, allows voice calls to be made and received, and allows SMS messages to be sent and received.

d. Light Dependent Resistor (LDR):

A light-dependent resistor (LDR), is a light sensor device that decreases resistance when lit and increases resistance when dark. Because of its light sensitivity, it provides an instant signal to the Arduino if the light is interrupted and does not fall on the LDR, even for a second.

e. Buzzer:

The buzzer works as an alarm in this project. When the link between the laser and the LDR fails, the LDR sends a signal to the Arduino, which activates the Buzzer, which sounds a high-pitched alarm.

f. Switch:

It is used to turn the buzzer on and off.

g. Connecting wires:

   Wires will be used to connect various devices to each other.

h. Battery:

   The power source of this project will be a battery and a 9V battery will be used.

i. Breadboard:

4. Working:

   This security system focuses on interruption. When the laser beam is stopped and is unable to reach the LDR, the voltage output of the LDR changes, and the circuit recognizes the change and generates a warning signal, following which the Buzzer starts emitting alarm signals. The project is built on the concept of interruption.

   If the laser light is turned off in any way, the alert will ring unless the alarm is reset using the pushbutton. A laser is a concentrated light source that produces a single-color straight beam of light. When the laser light strikes the LDR, a voltage is produced. When the laser beam is disturbed and unable to reach the LDR, the voltage output changes and an alert is triggered.