Laser Security System Using IOT

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Abstract— **This research paper analyzes that now a day's security is an important aspect. Technology develops day by day in the world. Nowadays crime gang also improves their technology to carry out to cover a large area. We know laser light goes too long distances without scattering effect. It's additionally obvious just at the source and occurrence point, in any case invisible. These two properties help us to develop a modern security system, which may name a "Laser Security System." When any person or object crossover the laser light, automatically the buzzer starts ringing. Laser beam goes through long distances without scattering effect and the ray is almost invisible. The project involves the use of ESP32, Laser light, Buzzer, LDR, PIR sensor, and a simple program. And also we use the Blynk app which is connected to the ESP32 microcontroller. From this app, we can enable or disable the security systems. With this equipment, we can easily set up security that makes sound or commotion when it distinguishes any sporadic action or can be part of a much bigger security or any other automation system which can alert the owner.**

Index Terms—**ESP32 Microcontroller, Laser, LDR, Blynk app, PIR**

I. INTRODUCTION

The need for security is a basic necessity of any individual. The feeling that we are safe and everything around us is all right is imperative for peaceful living. But in this unsafe world, when crime, terror, and threats are at their peak, how can one attain that sense of security? Here, laser security system provides us with a solution; for this reason, more and more people are installing them to stay safe and secure. Various electronic security systems can be used at home and other important working places for security and safety purposes.

A Laser Security alarm is a device used for security purposes. It has a wide application in fields of security and defense starting from the security of simple household material to a very highly valued material of an organization. They once used to be expensive solutions for security needs. Owing to cost-cutting and fast technological advancements, this form of security system is becoming more affordable.

Lasers differ from other light sources in a few significant ways. Two features are important for security systems. Unlike a light bulb or flashlight, laser light doesn't spread out, it is a narrow beam. And laser light is essentially a single color. Because laser light doesn't spread much, it can be sent it a long way and still have enough energy in a small area to trigger the security system detector. Because it's a single wavelength, it can put a blocking filter on the detector to let the laser light through without letting background light onto the detector.

Laser light travels in a straight line. For instance, to protect the front of the yard, putting the laser at one corner and the detector at the other corner would do the job. That's not a very practical configuration, though. More typically, it is needed to protect the perimeter of a room or at least the enhancement. So laser security systems start with a laser pointing to a small mirror. The first mirror is angled to direct the beam to a second small mirror, and so on until the final mirror directs the beam to the detector. If the beam is interrupted anywhere between the laser and the detector, the electronics will put the warning signal.

II. LITERATURE SURVEY

Early in the 1990s, the first security system was developed. They were difficult to monitor an infiltration because they were so large at the time. Today's technology has advanced significantly more than it did in the past. Burglar alarm systems are another name for laser security systems. The most widely used security systems employ lasers and light-dependent resistors. It is simple to build and install this system. There are several advanced security systems available today, including PIR-based systems,

temperature-based systems, infrared systems, and others. This system stands out among them as unique and efficient.

Due to circumstance, it has been shown that the majority of offenders are typically stopped by the mere presence of an alarm security system in our homes, hospitals, schools, workplaces, and enterprises. Criminals typically target much more vulnerable buildings than those protected by security alarms. With the emergence of man, security alarm systems began to advance. Humans use signals, shouts, and sounds to convey threatening information. Throughout the early stages of several African societies, it was later supplanted with the aid of handclapping and with the instillation of signals to warn society or to communicate a specific message.

William F. Channing invented the first electronic fire and security alarm system. Moses G. Farmer, a late electrical electronics engineer, created the structure. The initial installation of this alarm system took place in Boston, Massachusetts, and uses automatic indicator boxes to mark the location of the fire's outbreak. Following Dr. William's creation of this alarm system, numerous sophisticated and challenging fire and intruder security alarm system advancements that are too numerous to consider were made. A multilevel home security system created by Malaysian researchers includes several sensor nodes as input elements and output components that react to signals from input elements.

III.METHODOLOGY

This Project develops an efficient security system using Laser. For implementing this project we are using an ESP32 microcontroller, Laser, LDR, Blynk IOT Server, and other hardware devices. The Laser is a concentrated light source that puts a straight line, a pencil beam of light of a single color. The Laser beam is focused on a particular object if the object is theft or any disturbance in place then the Laser light directly falls on the LDR Sensor and it will give the command to the microcontroller and the system will activating the particular alerting unit that is red led, and the servo motor is automatically get closed, at the same time the notification is sent to the accessed person via the Blynk app. The PIR Sensor is used for human detection or motion detection of an unauthorized user.

A servo motor is used for opening and closing the gates. And ESP32 Cam is used for live-streaming purposes.

IV. MODELLING AND ANALYSIS

In this model, we are using the ESP32 microcontroller which is connected to the power supply. The block diagram consists of several blocks like a laser, LDR, buzzer alarm, and LEDs. This project works on the principle of interruption. To analyze this project, let us consider an example. Suppose in a museum there is a monument that is under the surveillance of this laser security system. So, here there are laser 1 and laser 2 which are focused on the particular monument. At the other end of this laser, there is a sensor called LDR. Since we are using two lasers so there are two LDRs. That is LDR1 and LDR2. And this LDR will be giving a command to the microcontroller whenever there is any disturbance in the position of the monument. Whenever there is a command from the LDR, this system will be activating the particular alerting unit that is red led, green led, buzzer, and servo motor. At the same time, the assigned security officer of the museum will get a notification in the Blynk app regarding the theft. And automatically the servo motors will be used to close the doors of the museum. And if everything is sorted off, then the security officer has permission to unlock the doors and can again activate this laser security system. Whenever there is a theft, the red led will turn ON and the Buzzer will also turn ON. This indicates the theft if the red led and buzzer is ON. Therefore, this is how the laser security system works. The ESP32 cam is used for live streaming via the Blynk app.
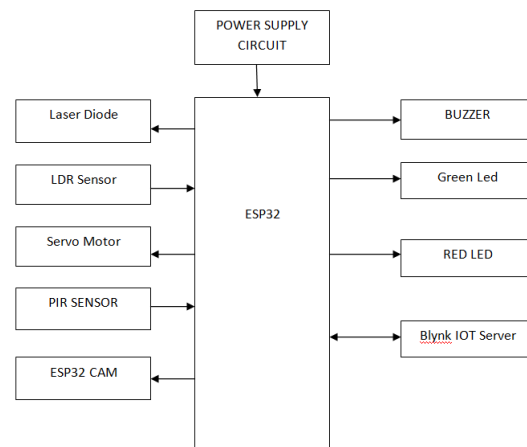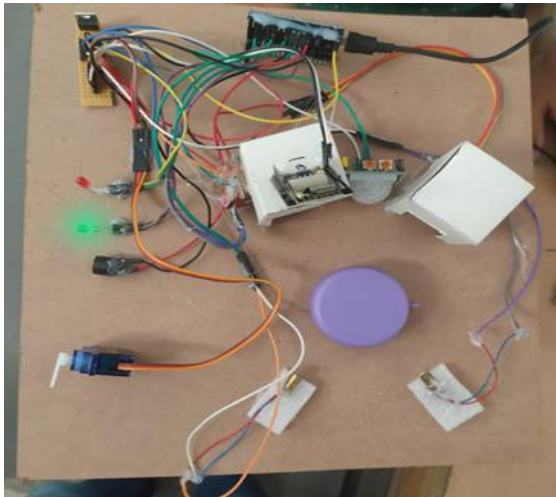

Fig 1: Block Diagram

V RESULTS

Fig 2: Experimental Setup

Here is a practical implementation of a Laser security system using IoT. When the device is ON and connected to Wi-Fi, the green LED is automatically on.
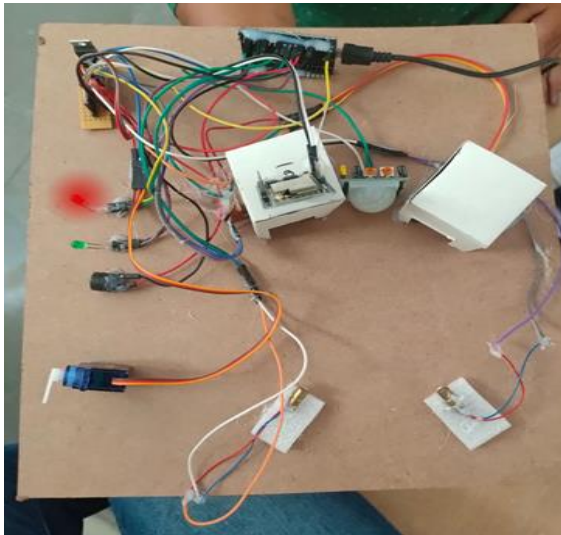

Fig 3: Red LED is ON

When the object is replaced by anyone or when the PIR sensor detects any person, the information is passed to the ESP32 Microcontroller and instantly the Red LED will be ON and the buzzer gets buzzed. And also a notification is sent to the owner through the BLYNK app and also through the mail.

VI CONCLUSION

People install laser security systems to stay safe, secure, and sound since they protect from ordinary crimes and theft. For security and safety reasons, a variety of electronic security systems can be utilized at home and other crucial workplaces. A crucial and beneficial system is the "Laser Security System". Robberies, thefts, and other crimes can be greatly reduced when using this approach. Our financial assets are kept safe by avoiding robbers, therefore their system gives us overall protection.

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