

# IOT BASED SMART SECURITY SYSTEM

A PROJECT REPORT

submitted by

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for the subject

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(Deemed to be University under section 3 of UGC Act, 1956)

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## ABSTRACT

This project proposes the design and development of an IoT-based laser security system that leverages laser technology for intrusion detection and IoT connectivity for real-time monitoring, alerting, and control. The primary objective of this system is to enhance the security measures for a designated area or premises by detecting unauthorized intrusions and providing a comprehensive security solution.

The system will be capable of detecting the presence of intruders within the designated area using laser-based sensors. Upon detection, the system will trigger immediate alerts and notifications, allowing for prompt response and intervention. The IoT connectivity of the system will enable real-time monitoring and control, allowing users to access the system remotely and receive updates on the security status.

Furthermore, the project scope includes the development of a user-friendly interface that will enable users to configure and customize the security settings, such as sensitivity levels and notification preferences. This interface will provide a seamless and intuitive experience for managing the security system.

The proposed system will be designed to integrate with existing security infrastructure, ensuring a comprehensive and cohesive security ecosystem. The integration with other IoT devices will further enhance the system's capabilities, allowing for a more integrated and responsive security solution.

Overall, this project aims to develop an innovative IoT-based laser security system that will provide enhanced security measures, real-time monitoring, and user-friendly customization, ultimately contributing to the improvement of overall security and safety for the designated area or premises.

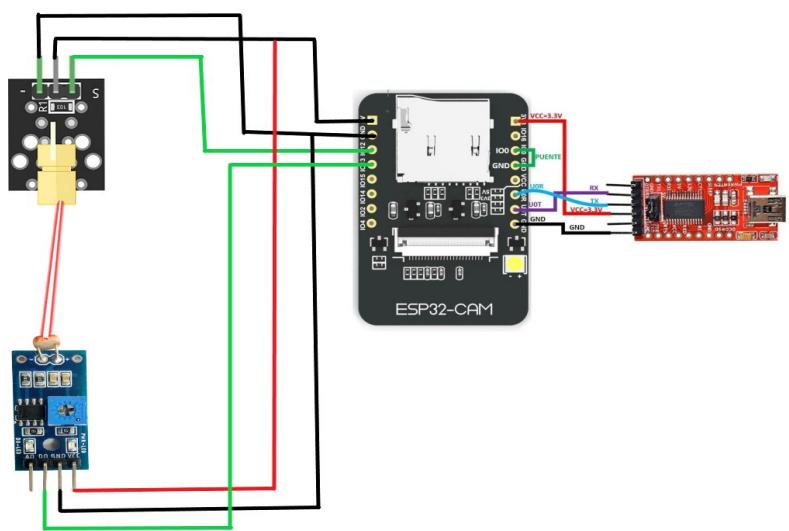
## INTRODUCTION

Rapid advancement in the field of technology, plays an important role in wide range of criminal activities. It opens more opportunities for crime and draws people into committing crime leading to an unprecedented growth in the crime rate. This system helps us to protect our home, offices, banks, lockers from intrusion and unauthorized access.

There are many types of security system that are currently used by most people like CCTV but these security systems are visible to naked eyes that will alert the intruder, to avoid this we are proposing a project on Laser based security system. This security system helps us to prevent incidence like robbery, stealing and this system can be implemented both indoor and outdoor.

If the intruder is detected ESP32 CAM starts capturing the image and it gives notification alert with image of the intruder to Wi-Fi connected device with the help of an using app i.e telegram.

## CIRCUIT DIAGRAM



# HARDWARE AND SOFTWARE DESCRIPTION

## PARTS USED –



**ESP32  
CAM**



**UART TTL**



**LDR MODULE**



**LASER MODULE**



**BREAD  
BOARD**



**JUMPER WIRES**

- The ESP32-CAM is a small size, low power consumption camera module .The ESP32-CAM can be widely used in intelligent IoT applications.
- In IoT, a UART TTL module facilitates serial communication between IoT devices and microcontrollers/computers using TTL logic levels.

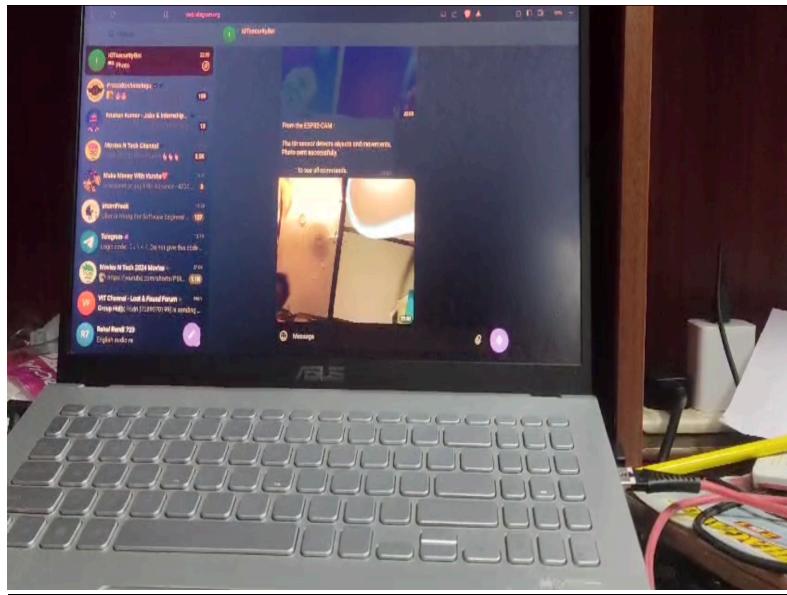
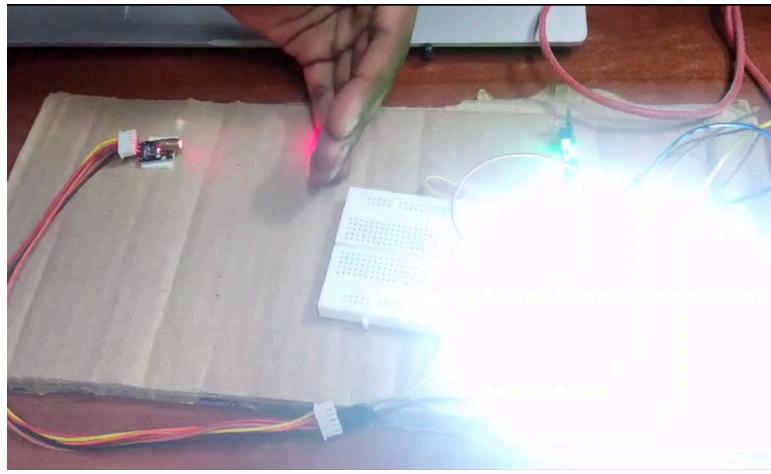
- An LDR module is a light-dependent resistor sensor used to detect and measure light intensity in electronic circuits and systems.
- A laser module is a compact device that emits a focused and coherent beam of light, often used for various applications such as optical communication.
- A breadboard is a reusable prototyping tool to create temporary circuits by easily connecting electronic components without the need for soldering.
- Jumper wires are flexible, insulated wires with connectors on each end, used to establish connections between electronic components on a breadboard or other circuit boards.

## WORKING –

- The laser security system consists of a laser module and a light-dependent resistor (LDR).
- When the laser beam is interrupted by an intruder, the LDR detects the absence of light, triggering a microcontroller.
- The microcontroller captures an image using a camera module and sends it to a Wi-Fi module.
- The Wi-Fi module establishes a connection with a phone through an app, enabling the image to be transmitted and viewed in real-time on the connected phone.

## CODING AND OUTPUT –

### Output



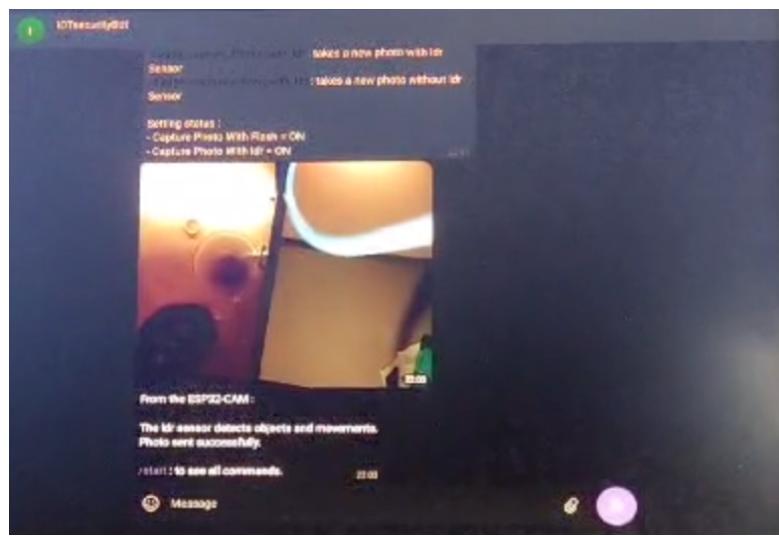
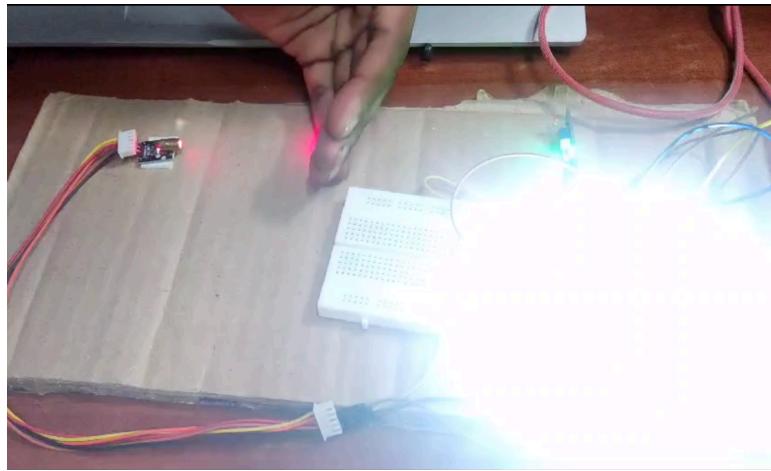
## Coding

The screenshot shows the Arduino IDE interface with the following details:

- Sketch:** sketch\_apr30a.no
- Board Selection:** Select Board (dropdown menu)
- Code Area:** Displays the C++ code for a WiFi client Telegram bot. The code includes includes for Arduino.h, WiFi.h, WiFiClientSecure.h, soc.h, rtc.h, esp\_camera.h, UniversalTelegramBot.h, ArduinoJson.h, EEPROM.h, and a configuration section for WiFi SSID and password, and a Bot Token.
- Output Area:** Shows the terminal output of the build process:

```
Downloading Ethernet@2.0.2
Ethernet@2.0.2
Installing Ethernet@2.0.2
Installed Ethernet@2.0.2
Downloading TFT@1.0.6
TFT@1.0.6
Installing TFT@1.0.6
Installed TFT@1.0.6
```
- Status Bar:** Ln 3, Col 1 × No board selected

# RESULTS



- The laser security system consists of a laser module and a light-dependent resistor (LDR).
- When the laser beam is interrupted by an intruder, the LDR detects the absence of light, triggering a microcontroller.
- The microcontroller captures an image using a camera module and sends it to a Wi-Fi module.
- The Wi-Fi module establishes a connection with a phone through an app, enabling the image to be transmitted and viewed in real-time on the connected phone.
- Then , the ESP32 CAM starts capturing the image if an intruder is detected and it gives notification alert with image of the intruder to Wi-Fi connected device with the help of an using app i.e telegram.

## CONCLUSION

- In conclusion, the laser security system project offers an effective and innovative approach to security by combining laser beam detection, image capture, and wireless transmission to a Wi-Fi connected phone.
  - The project demonstrates the feasibility of using readily available components such as laser modules, LDRs, microcontrollers, camera modules, and Wi-Fi modules to create a comprehensive security solution.
  - The project showcases the practical application of IoT technology in the field of security, offering enhanced protection and peace of mind for various environments, including homes, offices, retail stores, warehouses, and more. Overall, the laser security system project presents a valuable contribution to the realm of security systems and opens up possibilities for further advancements in this field.
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