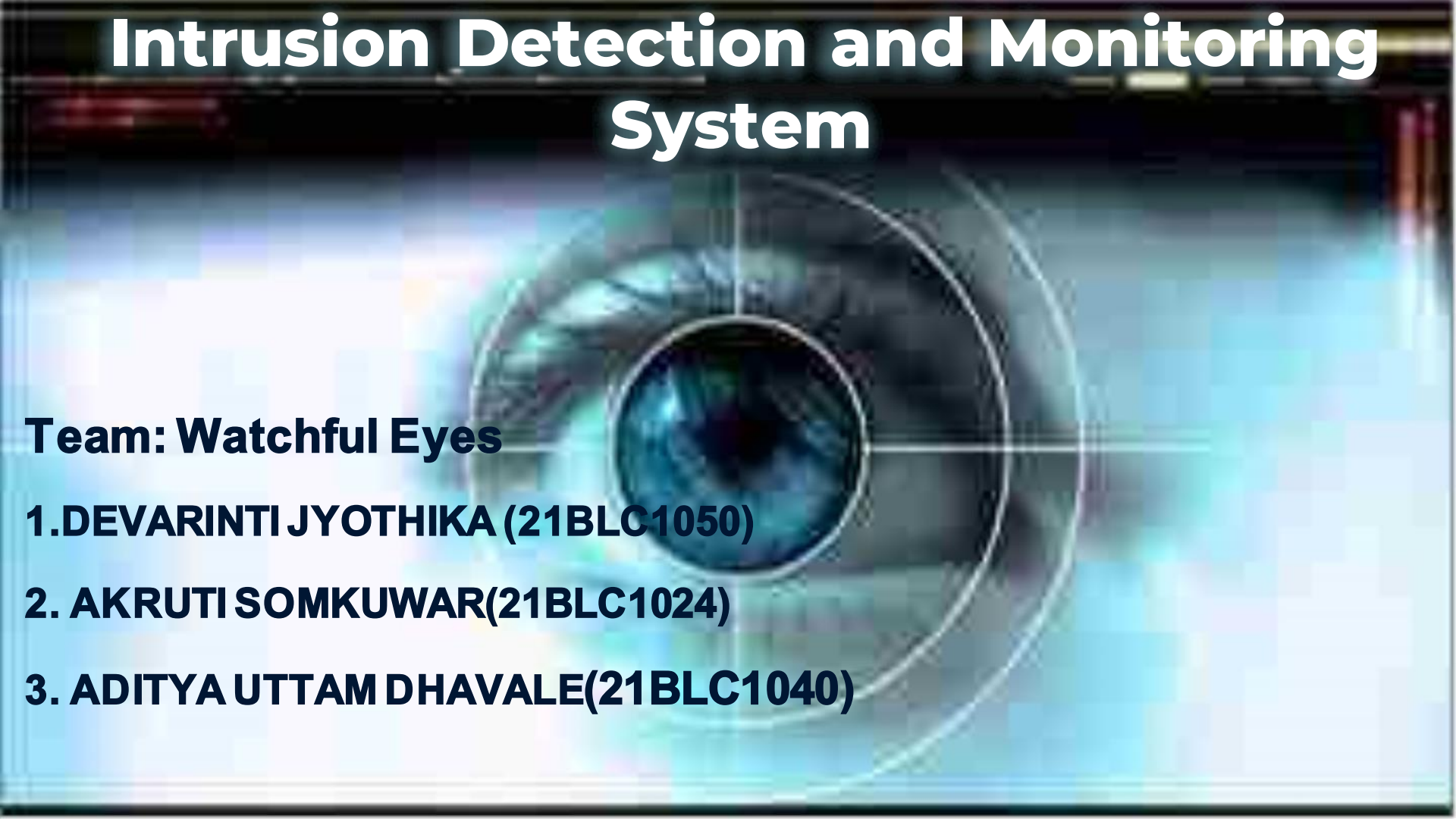
Intrusion Detection and Monitoring System



Team: Watchful Eyes

1.DEVARINTI JYOTHIKA (21BLC1050)

2. AKRUTI SOMKUWAR(21BLC1024)

3. ADITYA UTTAM DHAVALE(21BLC1040)

Project Objective

Our project aims to develop a motion-activated intruder detection system utilizing motion sensors and camera in an Internet of Things (IoT) framework. The Motion Sensor Camera project with WiFi Connectivity aims to develop a versatile surveillance system that detects motion and captures images wirelessly. The motion detector camera system will provide a reliable,efficient and user-friendly solution for monitoring and recording motion events in various settings such as homes, offices, warehouses or outdoor areas.

Project description

The system's primary function is to detect the presence of intruders and promptly capture their images and sends them to remote device over WiFi for identification and security purposes.

Develop a motion detection algorithm that accurately detects and tracks movements within a specified area.

Integrate a camera module capable of capturing clear images.

Establish a WiFi connection to facilitate real-time transmission of captured data to a remote device.

Implement a user-friendly interface to control and configure the system settings.

Enable real-time notifications/alerts on connected devices when motion is detected.

Components

1. ESP32 -cam (AI thinker)

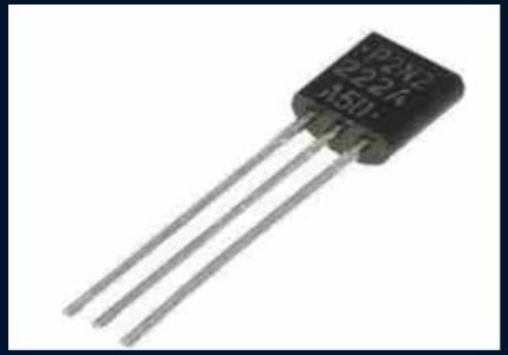
- The ESP32-CAM is a compact development board that combines the power of the ESP32 microcontroller with a camera module.
- It enables you to capture images and videos, and it has built-in Wi-Fi and Bluetooth capabilities for IoT applications.
- With features like GPIO pins, a microSD card slot, and a USB interface, it is a versatile board for building projects involving image and video capture.

2. PIR motion sensor

- The PIR motion sensor consists of a sensor element that detects changes in infrared radiation, a lens that focuses the infrared energy onto the sensor, and electronic circuitry that interprets the sensor's output.

- When a moving object enters the sensor's field of view, it causes a change in the infrared radiation pattern, triggering the sensor to send a signal indicating motion.

3.NPN Transistor



- The NPN transistor operates by controlling the flow of current between the collector and emitter terminals.
- When a small current is applied to the base terminal, it allows a larger current to flow from the collector to the emitter. This behavior makes the NPN transistor useful for amplification and switching applications in electronic circuits.

4. FTDI 232 USB to serial communication cable

- The FTDI FT232 is a USB-to-serial converter cable that allows communication between a computer and serial devices.
- The FT232 cable features an integrated FT232R chip, which handles the USB-to-serial conversion. It converts the USB signals from the computer into serial signals that can be understood by the connected device.
- It provides a convenient and straightforward way to establish serial communication with devices that lack built-in USB ports.

5. Resistors

6.LED

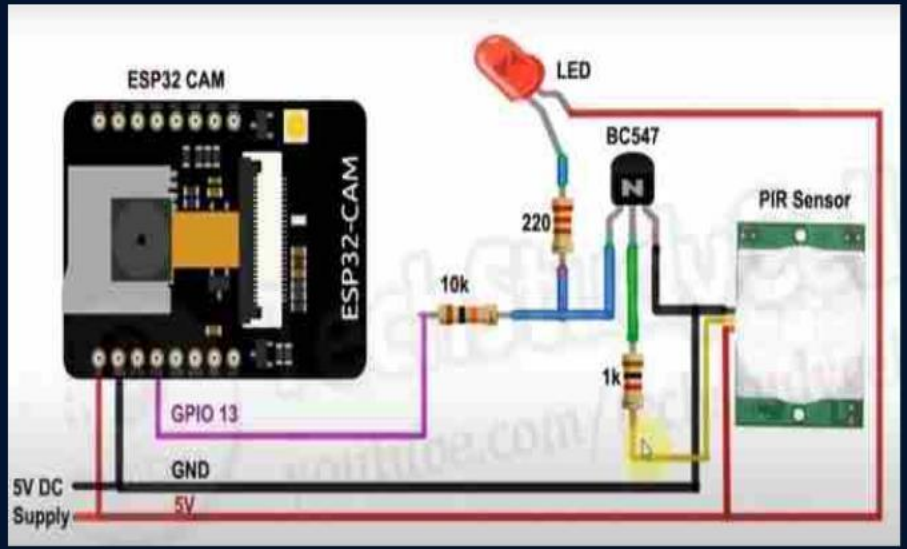
7. 5 volt DC Supply

8. Jumping Cables

Software Used

1. Arduino IDE (Version 2.1.0)

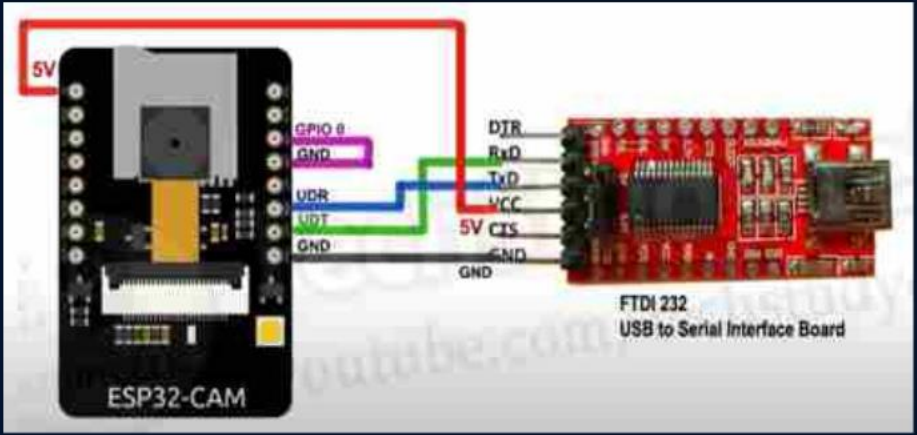
Schematic


ESP32 CAM
ESP32-CAM
LED
BC547
220
10k
1k
PIR Sensor
GPIO 13
GND
5V DC
Supply
5V

Algorithm

Step - 2 : Install Arduino -IDE (2.1.0) in laptop

Step - 3 : Connect the ESP 32 camera with FTDI 232 USB to serial communication interface using jumping cables as per the schematic .



Step - 4 : Connect the FTDI 232 serial communication to USB interface with laptop and interface the code in it .

Step - 5 : In the code give the wifi network Username and Password for wireless connection between the blynk app and the schematic.

Step - 6 : After interfacing remove the ESP 32 and connect it with PIR sensor as per the schematic.

Step - 7 : The GPIO 13 pin of ESP 32 is connected with PIR sensor .

Step - 8 : When PIR sensor detects motion , output pin of PIR sensor become high ,and give high pulse to the NPN transistor.

Step - 9 : As the NPN transistor is given high pulse , LED glows , the GPIO 13 becomes low and ESP 32 starts taking images .

Step - 10 : Through the Wifi connection in the board the notification is sent to the telegram app
and we can detect the intruder .

Progress

- We assembled the components Esp32 camera , FTDI 232 USB to serial communication cable , NPN transistor , PIR sensor

- Downloaded Arduino-IDE and installed the telegram app

- We interfaced the code in Esp32 camera using FTDI 232 USB to serial communication cable .

THANK YOU