

MICROPROCESSOR AND MICROCONTROLLER INTERFACING LABARATORY

MINI PROJECT REPORT



COLLEGE OF ENGINEERING, GUINDY

**DEPARTMENT OF ELECTRONICS AND COMMUNICATION
ENGINEERING**

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Project Title: “Surveillance Tele-Mobile UGV”

INTRODUCTION:

Surveillance security plays a crucial role in maintaining public safety and protecting assets. It involves the use of cameras and monitoring systems to observe and record activities in various environments, such as public spaces, businesses, and private properties. This helps deter criminal activities, as the presence of surveillance can discourage potential offenders. Additionally, surveillance footage can provide valuable evidence in investigations, aiding law enforcement in solving crimes and ensuring justice.

In our project we are going to do a UGV (Unmanned ground vehicle) which contains a camera. This UGV is a IoT based device, it is controlled by web page through wi-fi. So, it is also known as tele-controlled UGV. The UGV is used for real-time monitoring and surveillance applications in household and industrial purpose and it also used in the areas that are difficult or hazardous for human access. By using ESP32-CAM's onboard camera and Wi-Fi capabilities, the system provides live video streaming, which can be accessed remotely on mobile devices or computers through web interface. low-cost surveillance robot using the ESP32-CAM Module.

COMPONENTS USED:

- ESP-8266
- L293 DC Motor Driver
- 4 Motors with Wheels
- 12v Rechargeable battery
- Chassis
- Connecting Wire

WORKING MODE:

- Station Mode
- Access Point Mode

Station (STA): The ESP32 scans for available Wi-Fi networks which has internet connectivity and connects to a specified network using its SSID and password. Once connected, it is assigned an IP address by the router, allowing communication with other devices on the network. Through this IP address it creates the web page, and with help of this web page we can see the live streaming and also control the movement of the bot using this. In this mode we can control the bot from anywhere.

Station mode is a IoT applications because it allows the ESP32 to connect to a larger network. Through this network, the ESP32 can send data to and receive data from the cloud, enabling remote monitoring and control.

Access Point (AP): The ESP32 creates its own Wi-Fi network, allowing other devices to connect directly to it. In this mode, the ESP32 doesn't connect to an external router. The ESP32 provides an SSID and password for devices to connect to its network. Here you can communicate with the ESP32 locally without any external Wi-Fi network. The ESP32 can assign IP addresses of its own. And through this we can control the bot and see the live streaming.

This mode is not a IoT based application because it is not dealing with internet (cloud serve). We can control the bot from a specific range from the bot (i.e. the ESP 32 create wi-fi range). So, it is a short distance communication.

About our bot - in our bot we use both static and access point mode. According to the available facility we can switch from one mode to another.

CIRCUIT DIAGRAM:

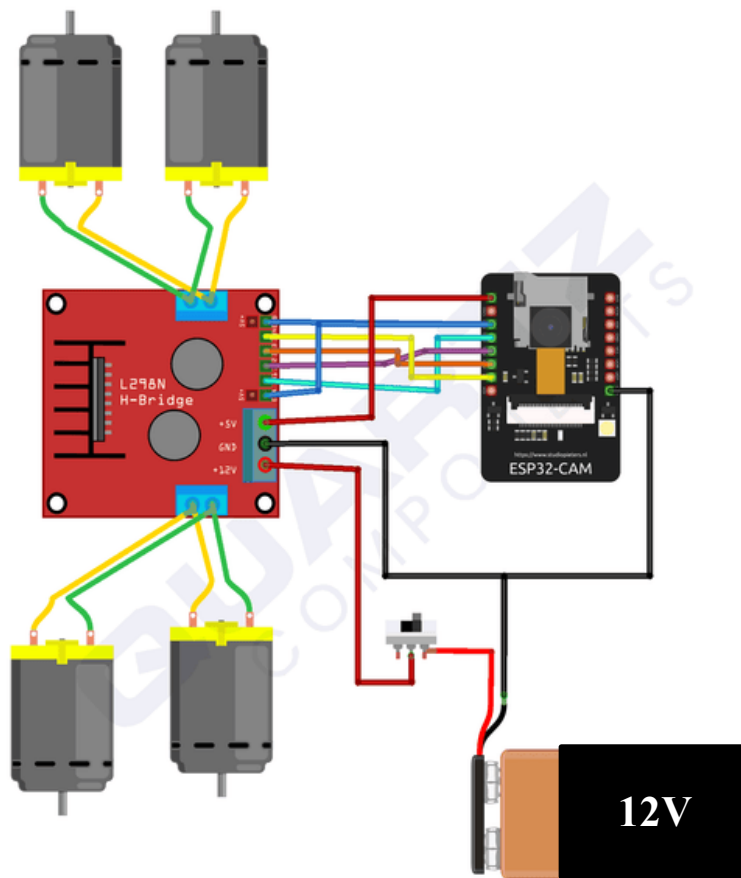


Fig 1: Block diagram

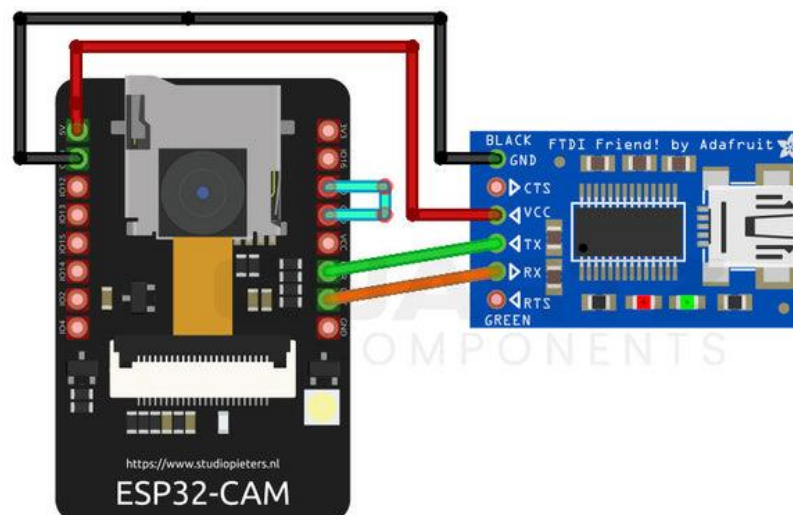


Fig 2: ESP 32 with TTL Programmer

PROJECT PHOTO:

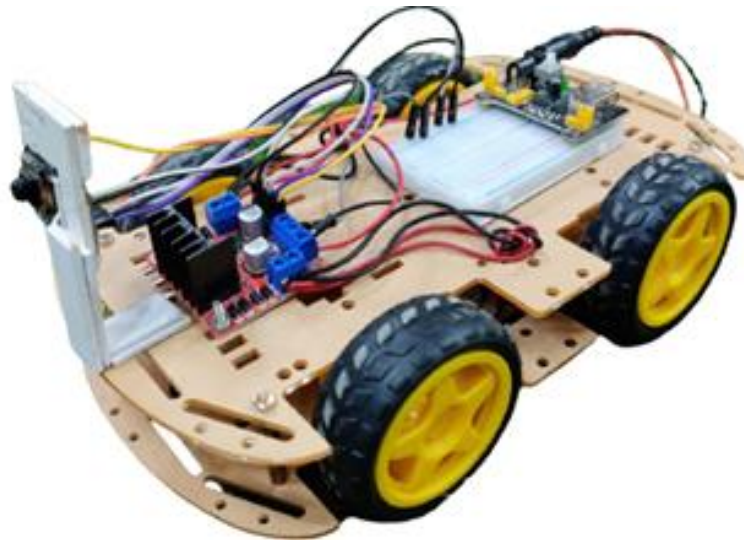


Fig 3: Surveillance UGV

WEBPAGE OUTPUT:

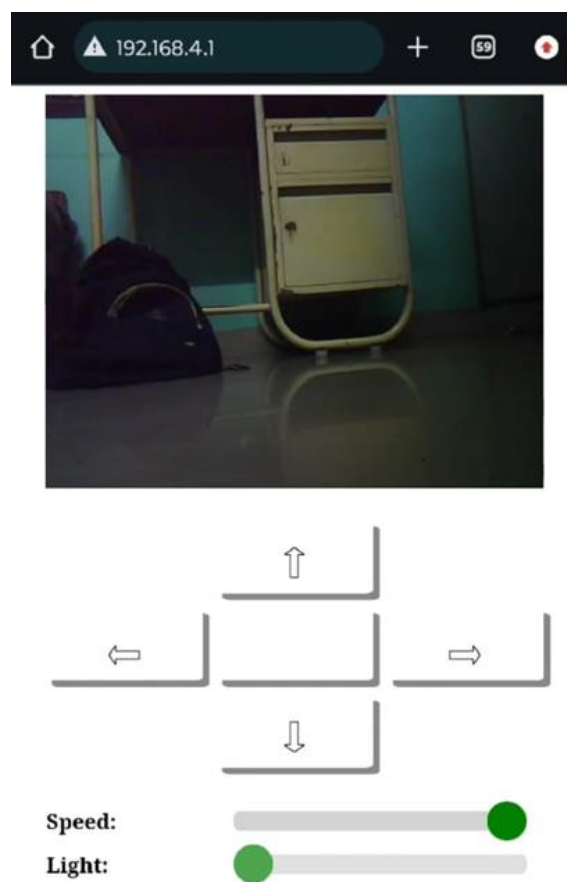


Fig 4: Web-Based Control Panel

APPLICATION:

- It is used in domestic home surveillance
- Industrial application
- Hazards area
- Observation of enemy positions

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