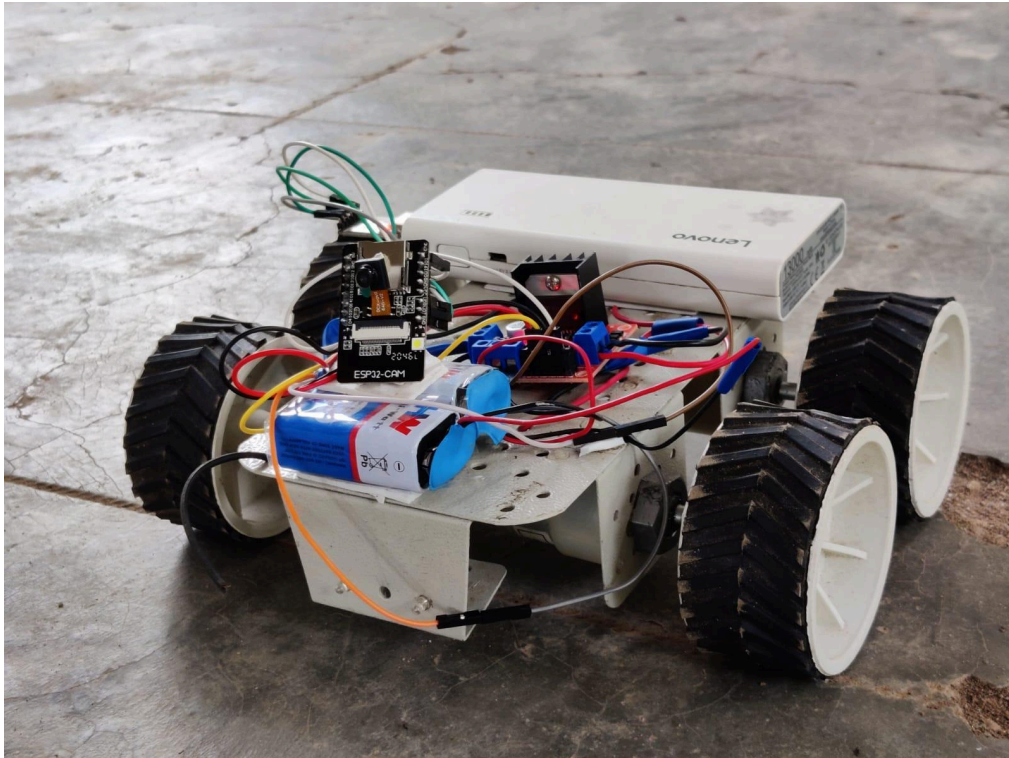




Wi-Fi Controlled Live Streaming Car

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Abstract

Wi-fi controlled car which can also livestream.

Introductory Overview

Our project aims to control a robotic car with the help of WiFi technology. Our car could also livestream with the help of a camera module embedded to the main controller board.

Goals

- i. Control the robot car using Wi-Fi technology.
- ii. Get the livestream of the events through a camera.

Components used

- i. Components provided by ISTE which were used
Motors (4 no.), Wheels (4 no.), USB TTL Module, Body of the car, Jumper wires.
- ii. Components our team purchased which were used in the project
ESP32 Camera Module, L298N Motor Driver, Batteries (6 no.), Power bank, Jumper wires

Specifications of components

ESP32 CAM Module

- Low-cost development board with Wi-fi camera.
- Has built in Wi-fi and Bluetooth module.
- Has built in 520 KB + external 4MPS RAM
- Power range of 5V
- It has OV2640 Camera module 2MP for face recognition
- Support TF card (max 4G)

L298N Motor Driver

- High power motor driver module for driving DC and Stepper motors.
- Consists of L298 motor driver IC and a 78M05 5V regulator.
- Motor supply voltage (max): 46V
- Motor supply current (max): 2A

Timeline

25 Aug 2021	First meeting of our group Decided on "Bluetooth controlled car" as the project Later came up with idea of using Wi-fi module instead
05 Sept 2021	Improved to a surveillance car Improved to a surveillance car controlled by Wi-fi ESP32 CAM module should be purchased for the purpose
06 Sept 2021	Got the components
09 Sept 2021	Met at college for assembling the components and brief discussion
17 Sept 2021	Finalised code
19 Sept 2021	Briefing before first sharing the progress with ISTE Team Also discussed the code.
20 Sept 2021	Briefed the progress of the project to ISTE
22 Sept 2021	Finalised the circuit diagram for the project
28 Sept 2021	Another meet at college for the final assembly Had to replace the motor driver provided as it didn't provide enough power
29 Sept 2021	Recorded the video for the presentation purpose
30 Sept 2021	Final Presentation to ISTE

Methodology

Materials required

ESP32 Camera Module, USB TTL Module, L298N Motor Driver, Gear motors (4), Wheels (4), Body of the robot car, Battery (2), Power bank, Jumper wires.

Connection

Connect the ESP32 camera module and USB TTL module as shown in the circuit below. Click the Upload button on Arduino IDE and wait for the code to get uploaded. If the code is compiled and uploaded successfully click the Reset button on ESP32 and remove the wire which connects IO00 and GND and open the serial monitor. Click the reset button once more the IP address will be displayed on the serial monitor. Copy the IP Address and paste that on your web browser. You can see the livestream from the camera module as well as the control options on your browser.

Do the rest of the circuit connections as shown in the figure below and connect that to the ESP32 camera module (You can either connect ESP to the main circuit via a breadboard or female-to-female jumper wire). One thing to notice here is to not connect the main power source in case you are uploading the code after the full circuit connection. In our case it threw some error when uploading the code while connecting to main power supply.

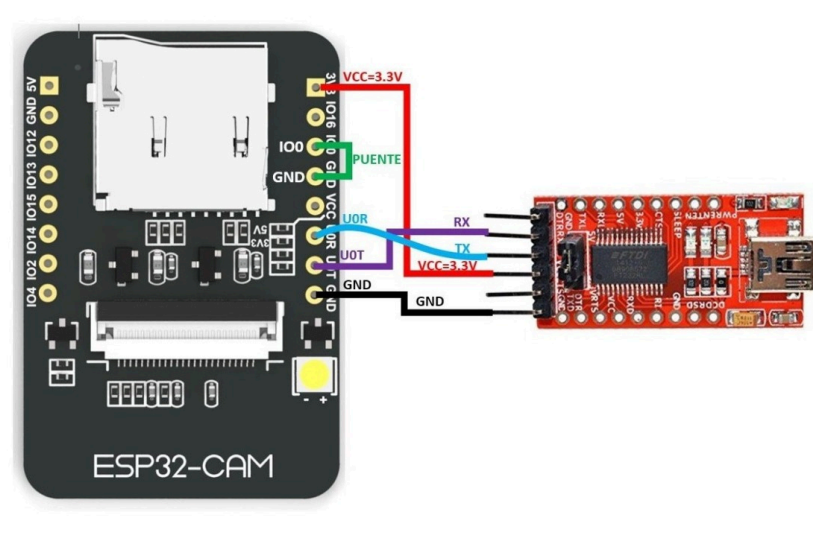
Working

After doing the above steps remove the USB TTL which was used to upload the code and connect that to a power bank. Now after doing all the above steps our robot car is ready to use.

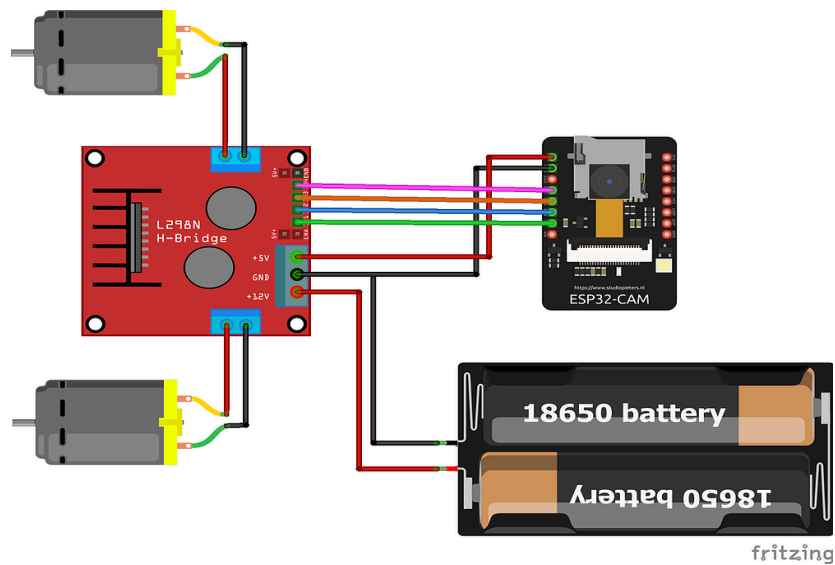
Robot car can be controlled via Browser where controlling commands and live streaming can be seen which is obtained using the IP address displayed on the serial monitor. The commands we give sends signals to ESP via Wi-fi which in turn controls motor driver by sending appropriate logic signals.

Circuits and Code

Connections from the ESP32 CAM module to the USB TTL to upload the code



Connections from ESP32 CAM module to L298N Motor Driver



Code and other resources

[GitHub codelink](#)

Market Study

- i. Spy Car
 - Got a lot of military and surveillance applications.
 - Ensuring security and surveillance are required for all organizations worldwide. Governments, enterprises, financial institutions, and healthcare organizations are expected and required to have a certain level of security and monitoring measures.
 - Monitor and record borders, ports, transportation infrastructure, corporate houses, educational institutes, public places, buildings, and others
- ii. Smart Door lock with Image processing
- iii. Perform observations and calculations where it is impossible for humans to reach

Innovations

We tried creating a telegram bot which on request gives a picture of the camera's current view. But there was small logical bug.

A face recognition system can be integrated to this project

With the inclusion of more sensors this cam module can be used to sense and record the conditions of an environment that humans cannot directly approach and calculate.

References

How to upload code to ESP32 CAM Module [upload code](#)

Websites referred for the project [viralsciencecreativity](#)

Videos for circuit connection reference [circuit video](#)

Datasheet for ESP32 CAM Module [ESP32CAM](#)

Datasheet for L298N Motor Driver [L298N-MotorDriver](#)

Conclusion

We were provided with gear motors, and L293D Motor driver which doesn't supply enough power for the working of motor. Later we had to purchase L298N Motor driver in order to meet the power requirements of motors. We provided an input of 18V. Still the circuit needed more power for working, so we had to use a power bank, connected to the USB TTL Module, which rectified the problem.

The car was up and running, controlled from the browser, along with live streaming visible on the controlling device.

Allow us to express our gratitude to ISTE for organizing this event and giving us this opportunity to learn.

THANK YOU!