IR WiFi Control Car

Use the K1 button to switch between WiFi remote control car and infrared remote control car in the car function mode selection stage.

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Since the previous tutorial has explained the basic knowledge of all car modules,
the car control tutorial will not be repeated, and the main focus is on the car
function implementation ideas!
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Device connection

Hardware connection

Use Type-B data cable to connect Arduino Uno and computer.

Software connection

Open the "Arduino IDE" software and select the model and serial port number corresponding to the development board.

Implementation ideas

WiFi remote control car: parse the data sent by the WiFi camera through the serial port and control the car according to the data;

Infrared remote control car: receive and parse the data from the infrared receiver, and then control the corresponding peripheral status of the car according to the data.

WiFi remote control car

Data format (communication protocol)

We only parse data in two data formats.

Data format	Description	Example
$	Data header	
#	Data tail	
Data,Data,Data	Data type 1	Data represents only numbers: 1,0,0,0
Alphabet+Data	Data type 2	Alphabet+Data represents a letter plus the following three digits: A100

Example:

Data format 1: $1,0,0,0#, $2,0,0,0#, $3,0,0,0#

Data format 2: $A100#, $A090#, $B120#

Note:

- Data format 1 is mainly used to control the car status
- Data format 2 is mainly used to control the servo angle

Click the function button on Yahboom CAM, the serial port will send data in the above format, our program parses the data and controls the car status.

Infrared remote control car

Data analysis

Infrared remote control	Parsed data	Function
Power	0x00	Stop all peripheral functions
RGB	0x40	Switch RGB colors
Buzzer	0xA0	Control the buzzer
Car Forward	0x80	Car forward
Car Backward	0x90	Car backward
Car Left	0x20	Car moves to the left
Car Right	0x60	Car moves to the right
Car Left Spin	0x10	Car rotates left
Car Right Spin	0x50	Car rotates right
Add	0x30	Increase speed

Infrared remote control	Parsed data	Function
Sub	0x70	Decrease speed
Number 0	0xB0	None
Number 1	0x08	None
Number 2	0x88	None
Number 3	0x48	None
Number 4	0x28	None
Number 5	0xA8	None
Number 6	0x68	None
Number 7	0x18	None
Number 8	0x98	None
Number 9	0x58	None

Code Analysis

The code content is not introduced here. For detailed code, please refer to the corresponding code file, which is provided in the download area!

This function combines the infrared remote control car and WiFi remote control car function codes. You can understand the ideas based on the code.

Experimental effect

After the program is started, the RGB light on the car expansion board will display white, indicating that the remote control function mode selection stage has entered.

Mode switching: Press the K1 button on the car expansion board to switch between two remote control modes. The mode switching time is about 5 seconds. Once the RGB does not display color, it means that the function switching mode is over and the last selected remote control mode is retained.

RGB light displays white: WiFi remote control car mode

RGB light displays red: infrared remote control car mode

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If you want to switch the remote control mode again, you can press the Reset
button on the development board to restart the program!
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The drive motor needs an external battery pack and the expansion board switch is
turned on to drive normally.
The burning program cannot use other programs to occupy the serial port or the
external serial communication module (for example: WiFi camera module), otherwise
the program cannot be burned or an error message will be prompted!
```

APP remote control car

The car function mode needs to select WiFi remote control car mode: the initial setting is WiFi remote control mode after the program starts. Please wait for 5 seconds before remote control operation.

APP connection

The mobile phone connects to the hotspot of the WiFi camera (the name of the built-in hotspot: Yahboom_ESP32_WIFI), and then open the YahboomCam software.

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Some mobile phones will prompt for connecting to a hotspot without a network. We need to click to keep connected!
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Enter IP:192.168.4.1 in the YahboomCam software, then click to log in and enter the APP control interface.

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The IP of the WiFi camera's built-in hotspot is 192.168.4.1
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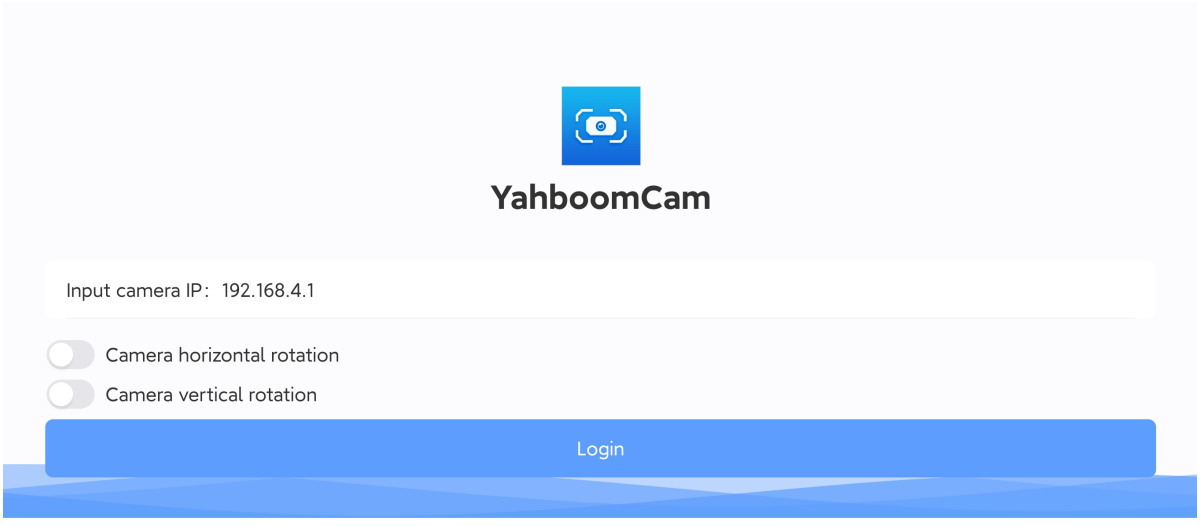

APP control

After entering the APP interface, the APP will display the camera screen.

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If there is no display, check whether the phone is connected to the WiFi camera
hotspot normally
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- Left button

Control the movement of the car: U (forward), D (backward), L (left move), R (right move), S (stop), LT(left rotation), RT(right rotation)

- Right button

Control the rotation angle of the servo: CL(rotate left), CR (rotate right), CU (rotate upward), CD (rotate downward)

Note:

Image problem: Due to the installation problem of the WiFi camera on our car, we need to check the horizontal flip and vertical rotation of the camera, so that the displayed image will be normal!

Servo control problem: Our car is only equipped with one servo, so it can only be controlled by the left and right of the servo, and the rotation range is controlled in front of the car [35°, 145°].

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The car program limits the rotation angle of the servo sent by the APP, and the
control rotation range is [35°, 145°], which is to avoid collision or squeezing
between the WiFi camera and the car expansion board.
```

Infrared remote control car

The car function mode needs to select the infrared remote control car mode: please press the K1 button within 5 seconds after the program starts. When the RGB light of the expansion board changes from white to red, it means that the mode is switched to infrared remote control.

Infrared control

Use the infrared remote control to aim at the infrared receiver on the car expansion board to control the buttons. The APP only sets the functions of some buttons.

Infrared remote control	Parse data	Function
Power	0x00	Stop all peripheral functions
RGB	0x40	Switch RGB colors
Buzzer	0xA0	Control the buzzer sound
Car Forward	0x80	Car forward
Car Backward	0x90	Car backward
Car Left	0x20	Car moves to the left
Car Right	0x60	Car moves to the right
Car Left Spin	0x10	Car spins left
Car Right Spin	0x50	Car spins right
Add	0x30	Speed increase
Sub	0x70	Speed reduction

The infrared remote controller controls the movement of the car. You need to press and hold to perform corresponding control: for example, long press the car to move forward, and release the button to stop the car.

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In order to avoid infrared light interfering with the sensor, we need to use the infrared remote control function indoors
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