

Infrared sensor avoid

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This tutorial is a comprehensive experiment combining multiple peripherals. You can understand individual peripherals before conducting this experiment.

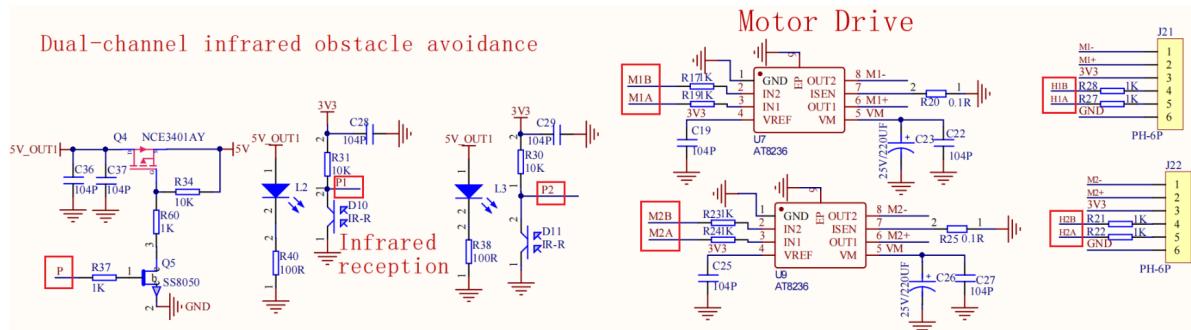
1. Software-Hardware

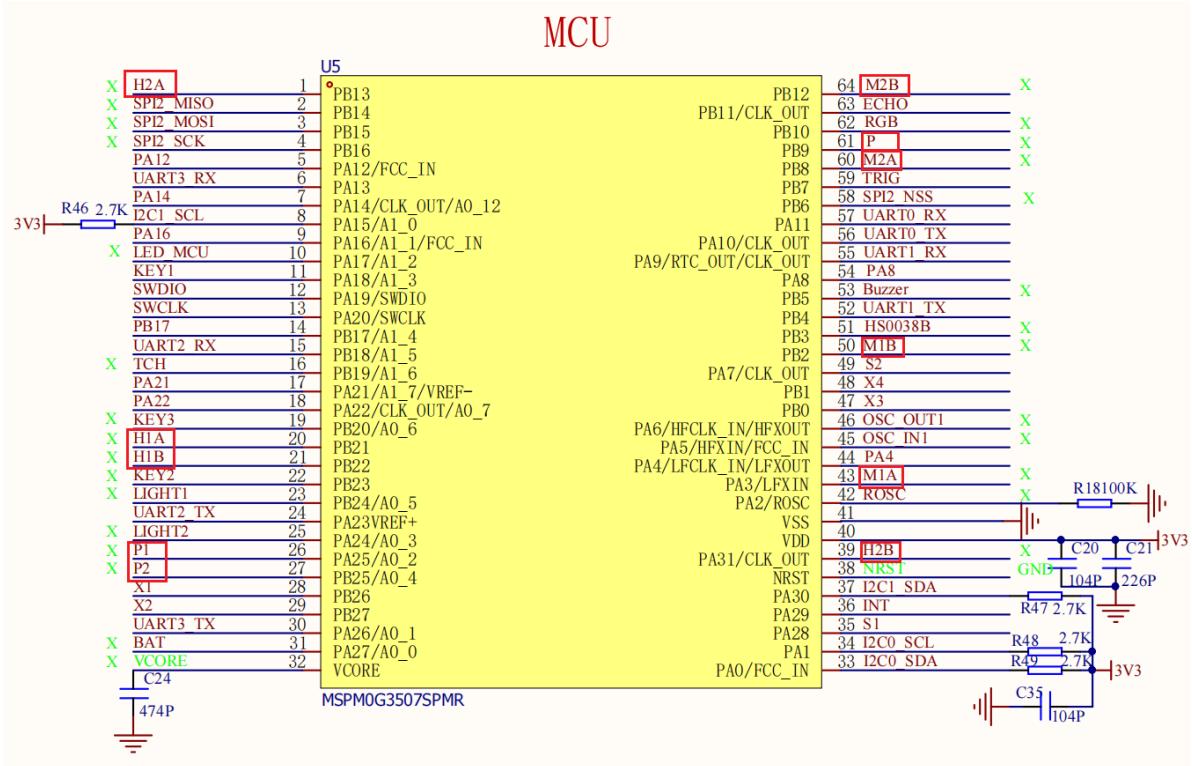
- KEIL
- MSPM0G3507 Development Board
- Type-C data cable or DAP-Link

For program download or simulation to the development board

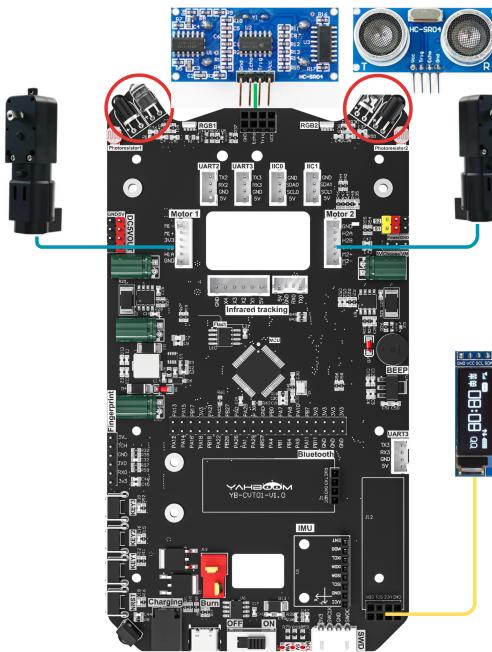
2. Brief Principle

2.1 Hardware Schematic Diagram





2.2 Physical Connection Diagram

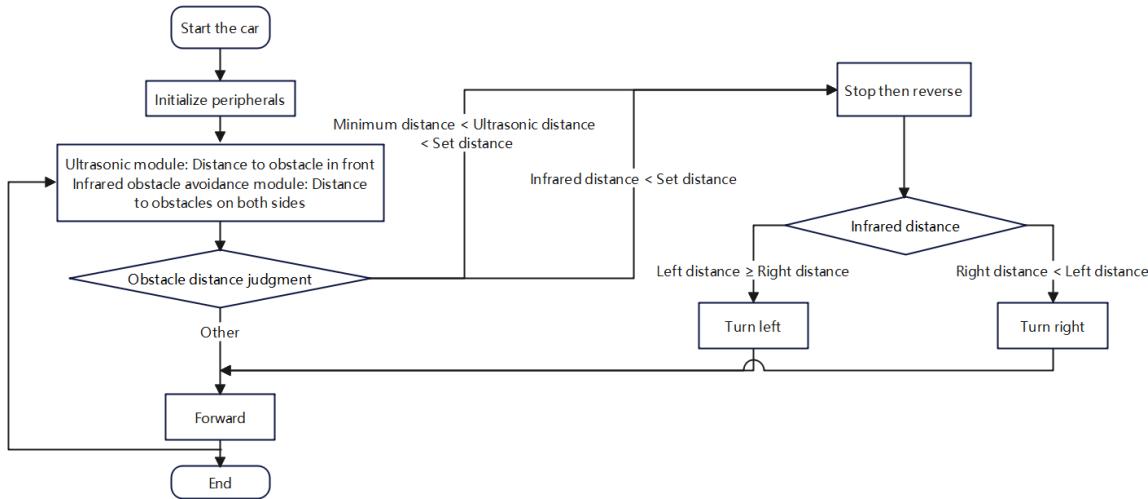


2.3 Control Principle

Obtain obstacle distance through infrared sensor and ultrasonic module, and control car movement state (rotation, forward and backward) based on the distance.

This project combines infrared sensor and ultrasonic module to implement obstacle avoidance function, obtaining front distance through ultrasonic and side distances through infrared sensor: If obstacles in front or on sides detected by ultrasonic are within the set distance, we call the car control function in the function, then control the car to turn left or right based on the left and right distances from infrared sensor, so that the car can be adjusted in time; If obstacles are not within the set distance, we control the car to move forward.

- Program Flowchart



Module	Function
Ultrasonic Module	External information collection: obtain front obstacle distance
Infrared Sensor	External information collection: obtain side obstacle distances
Motor	Motion control

3. Main Functions

Mainly introduces the functional code written by users, **for detailed code, you can open the project files we provide and view the source code in the Bsp folder.**

Function: get_light_distance

Function Prototype	<code>void get_light_distance(uint16_t distance)</code>
Function Description	Set infrared obstacle avoidance distance
Input Parameters	Infrared obstacle avoidance measurement value
Output Parameters	None

Function: Open_IR_Switch

Function Prototype	<code>void Open_IR_Switch(void)</code>
Function Description	Turn on infrared obstacle avoidance output
Input Parameters	None
Output Parameters	None

Function: Close_IR_Switch

Function Prototype	void Close_IR_Switch(void)
Function Description	Turn off infrared obstacle avoidance output
Input Parameters	None
Output Parameters	None

4. Experimental Phenomenon

After successfully downloading the program, press the RESET button on the development board and observe the car's effect!

For program download, refer to [3. Development Environment Setup and Usage:
3.Uniflash Programming]

Phenomenon:

No obstacle: The car moves forward

With obstacle: Judge the distances of left and right infrared sensors, rotate to the side with greater obstacle distance