

Lesson 19 Line Tracking Car

19.1 Overview

Reflective optical sensors (including tracking sensors) should be avoided from use in environments with infrared interference, such as direct sunlight. Sunlight contains a large amount of invisible light, such as infrared and ultraviolet rays. Reflective optical sensors cannot function properly in environments with strong sunlight exposure.

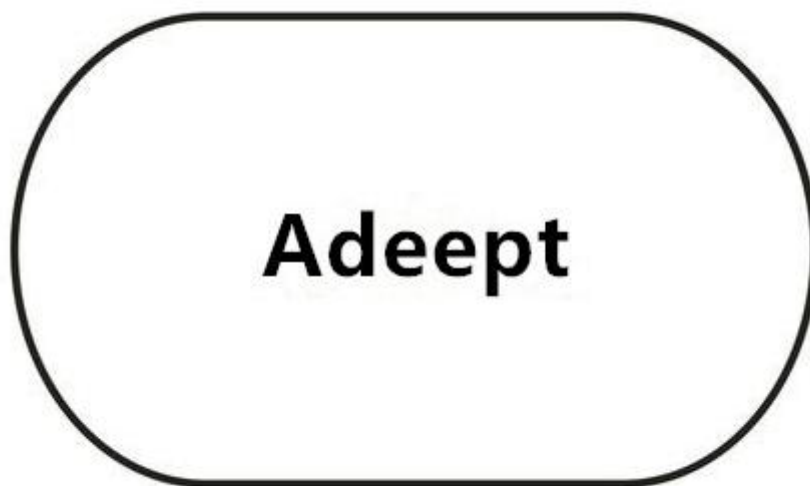
19.2 Principle Introduction

The table below shows the values for all cases when the three tracking sensors detect objects of different colors. A detection of a black object or no object represents 1, and a detection of a white object represents 0. Value represents the value composed of three signals, which is used to judge the moving direction of the car. The program we provide uses the decimal value as the judgment value.

Left	Middle	Right	Value(Binary)	Value(Decimal)
0	0	0	000	0
0	0	1	001	1
0	1	0	010	2
0	1	1	011	3
1	0	0	100	4
1	0	1	101	5
1	1	0	110	6
1	1	1	111	7

19.3 Wiring diagram

Make a simple video line inspection environment for testing the Line Tracking function. Example: Paste a piece of black tape on A4 paper. We used tape about 1.5cm wide.



19.4 Code

```
01 void Line_Tracking(){
02     value = Track_Read(); //Read the value of the tracking module.
03
04     switch (value)
05     {
06         case 0: //000 left
07             Motor(1, -1*dir, lt_speed);
08             Motor(2, -1*dir, lt_speed);
09             Motor(3, 1*dir, lt_speed);
10             Motor(4, 1*dir, lt_speed);
11             break;
12
13         case 2: //010 forward
```

```
14     Motor(1, 1*dir, lt_speed); //Motor1 forward
15     Motor(2, 1*dir, lt_speed); //Motor2 forward
16     Motor(3, 1*dir, lt_speed); //Motor3 forward
17     Motor(4, 1*dir, lt_speed); //Motor4 forward
18     break;
19
20     case 4:    //100 left
21         Motor(1, -1*dir, lt_speed);
22         Motor(2, -1*dir, lt_speed);
23         Motor(3, 1*dir, lt_speed);
24         Motor(4, 1*dir, lt_speed);
25         break;
26
27     case 6:    //110 left
28         Motor(1, -1*dir, lt_speed);
29         Motor(2, -1*dir, lt_speed);
30         Motor(3, 1*dir, lt_speed);
31         Motor(4, 1*dir, lt_speed);
32         break;
33
34     case 1:    //001 right
35         Motor(1, 1*dir, lt_speed);
36         Motor(2, 1*dir, lt_speed);
37         Motor(3, -1*dir, lt_speed);
38         Motor(4, -1*dir, lt_speed);
39         break;
40
41     case 3:    //011 right
42         Motor(1, 1*dir, lt_speed);
43         Motor(2, 1*dir, lt_speed);
44         Motor(3, -1*dir, lt_speed);
45         Motor(4, -1*dir, lt_speed);
46         break;
47
48     case 7:    //111 forward
49         Motor(1, 1*dir, lt_speed);
50         Motor(2, 1*dir, lt_speed);
51         Motor(3, 1*dir, lt_speed);
52         Motor(4, 1*dir, lt_speed);
53         break;
54
55     case 5:    //101 forward
56         Motor(1, 1*dir, lt_speed); //Motor1 forward
57         Motor(2, 1*dir, lt_speed); //Motor2 forward
58         Motor(3, 1*dir, lt_speed); //Motor3 forward
59         Motor(4, 1*dir, lt_speed); //Motor4 forward
60         break;
61     default:
62         break;
63 }
64 }
```

For the complete code, please refer to the "IR_Control.ino" and "Aadept_Car_For_Arduino.cpp" files.