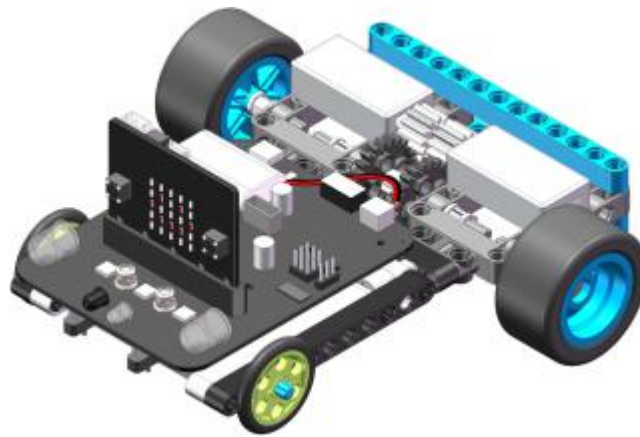# Lesson2 of Building:bit Following car ---"Infrared obstacle avoidance"

1.Experimental phenomena

After downloading the programming, open the power switch of the Following car, Following car will advance. If car encounter an obstacle, it will back for 1 second and then rotate right for 1 second, and finally go straight.

2.Preparation before class

We needs to be ready:

Building Block Following car *1

USB data cable *1

2-1.Two programming methods:

Online programming:

First,we need to connect the micro:bit to the computer by USB data cable, the computer will pop up a USB flash drive.Then, click on the URL in the USB flash drive: http://microbit.org/ to enter the edit process interface, click to 【Extensions】, and copy the package URL:

https://github.com/lzty634158/yahboom_mbit_en to the input field, and you can use the building blocks of the Yahboom software package.

Offilne programming:
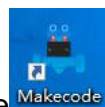
Open the offline programming software Makecode , click to 【Extension】 and copy the package URL: https://github.com/lzty634158/yahboom_mbit_en to the input field, and you can use the building blocks of the Yahboom software package.

For detailed programming, please read the documentation before class 【1. Preparation before class】----【Introduction of programming method】. We use micro:bit official website for online programming in here.

3. Infrared obstacle avoidance principle

The infrared sensor possess a pair of infrared emitting and receiving tubes. The transmitting tube emits infrared light of a certain frequency. Within a certain range, if there are no obstacles, the infrared light emitted will gradually

weaken because of the distance of the spread, and finally disappear. If there is an obstacle, the infrared light will encounter the obstacle and it will be reflected to reach the receiving tubes.
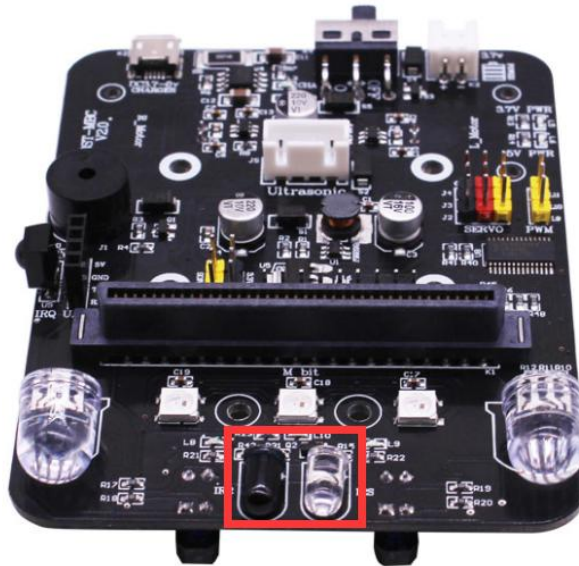

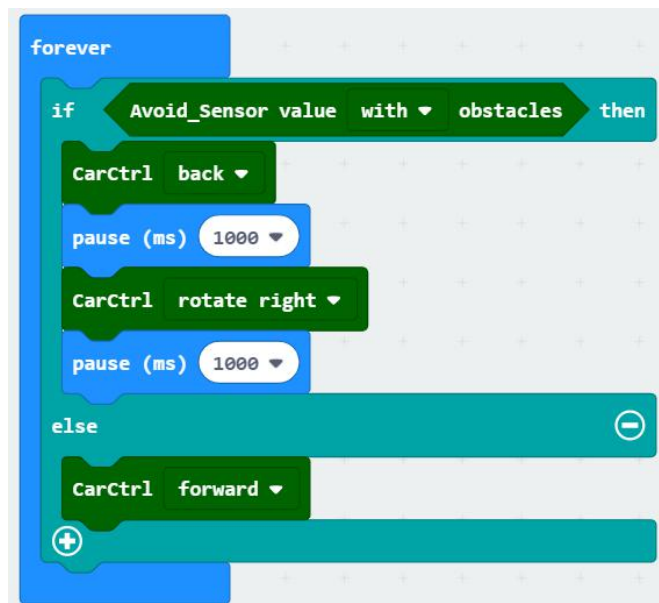Figure 1 Infrared obstacle avoidance sensor

4.Studying blocks

Blocks	Instruction
	The code inside is executed after booting.
	If true then execute. If it is false, it will not be executed.

if Avoid_Sensor value with ▼ obstacles then CarCtrl back ▼ else ⊖ CarCtrl forward ▼ ⊕	If there is an obstacle in front, then the car will back, otherwise the car will forward.
▦ Basic ••• more pause (ms) 100 ▼	The program pauses for 100 milliseconds and the time can be modified by yourself.
Mbit_Motor 🚗 Mbit_Robot → Avoid_Sensor value with ▼ obstacles	The infrared sensor detects if there is an obstacle in front.
🚗 Mbit_Robot 📶 Mbit_IR ⋮ Neopixel Line_Sensor direct i CarCtrl forward ▼	The car's motion state selection.You can select forward,back,turn left, turn right,rotate left, rotate right, and stop.

5.Programming

Next, we started to write the infrared obstacle avoidance program for the building block Following car. After writing, we need to download the program to the micro:bit board of the building block Following car.

forever
if Avoid_Sensor value with ▼ obstacles then
CarCtrl back ▼
pause (ms) 1000 ▼
CarCtrl rotate right ▼
pause (ms) 1000 ▼
else ⊖
CarCtrl forward ▼
⊕

! Note: This experiment must be done indoors to reduce the interference of sunlight on the infrared sensor.