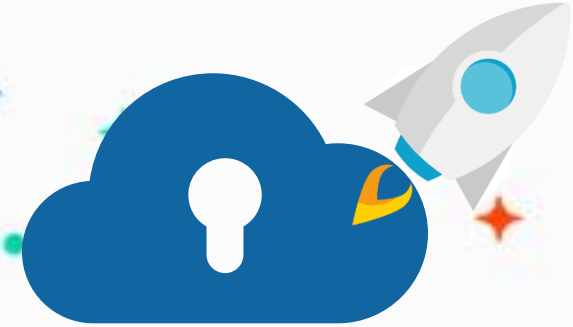

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Lesson 23. Gesture-commanding Car

LETURER:

Lesson Objective

Learning Objectives

1. In-depth understanding of gesture recognition.
2. Use the gesture sensor to control the movement of the car.

Possible Difficulties

1. Multi-directional mobile program.
2. The logic of multi-layer judgment.



Background Information



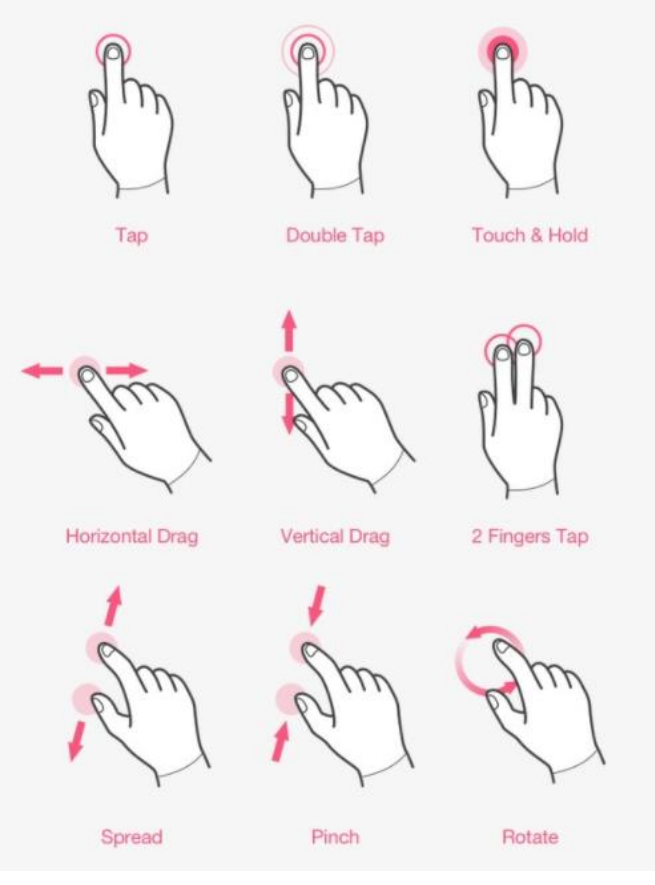
Context Import



How do people communicate when it is not convenient to speak?

We communicate vaguely and ambiguously with each other through gestures or eye contact. Although the efficiency is low and the error rate is high, there is no better way in special occasions.

Context Import



In the same way, in the field of human-computer interaction, gesture operations also exist. We can let the machine recognize different gestures, and then execute the corresponding instructions to meet our needs. Of course, under normal circumstances, it is more appropriate to input commands through the screen or keyboard and mouse.

Context Import



At present, the most widely used gesture control is mobile devices such as mobile phones and tablets. When you need to light up the screen or reject an incoming call, you can use the motion of waving your hand to complete it. The gestures of different devices will be different.



Knowledge Introduction

New Knowledge



Unimpeded roads are a major prerequisite for vehicles to run normally. However, in the case of power outages or severe congestion, road traffic lights cannot work normally. At this time, traffic police need to be on-site to command. Gestures are often used to command, or traffic is conducted on the spot with the sound of a whistle.

New Knowledge



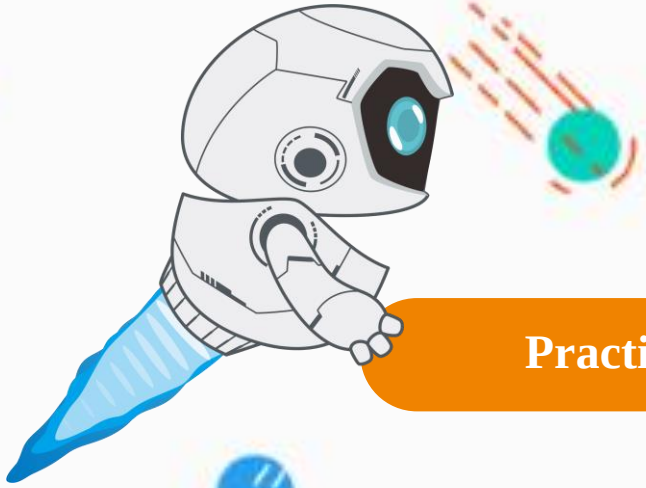
Traffic gestures refer to the gestures used by traffic police to ensure safe and smooth road traffic and direct vehicles in real time. There are altogether 8 kinds of signals: stop, go straight, turn left, turn left and wait to turn, turn right, change lanes slowly, slow down, signal vehicles to pull over and stop.

New Knowledge



In addition to gestures outside the car, gesture-controlled cars have long been born. It is a car that can recognize the driver's gestures. The driver can issue instructions to the car by making corresponding gestures in the car.

Today we're going to try to make a robot that recognizes gestures.

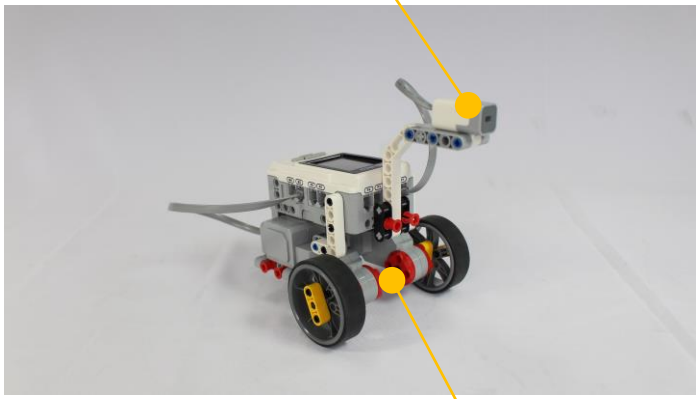


Practice



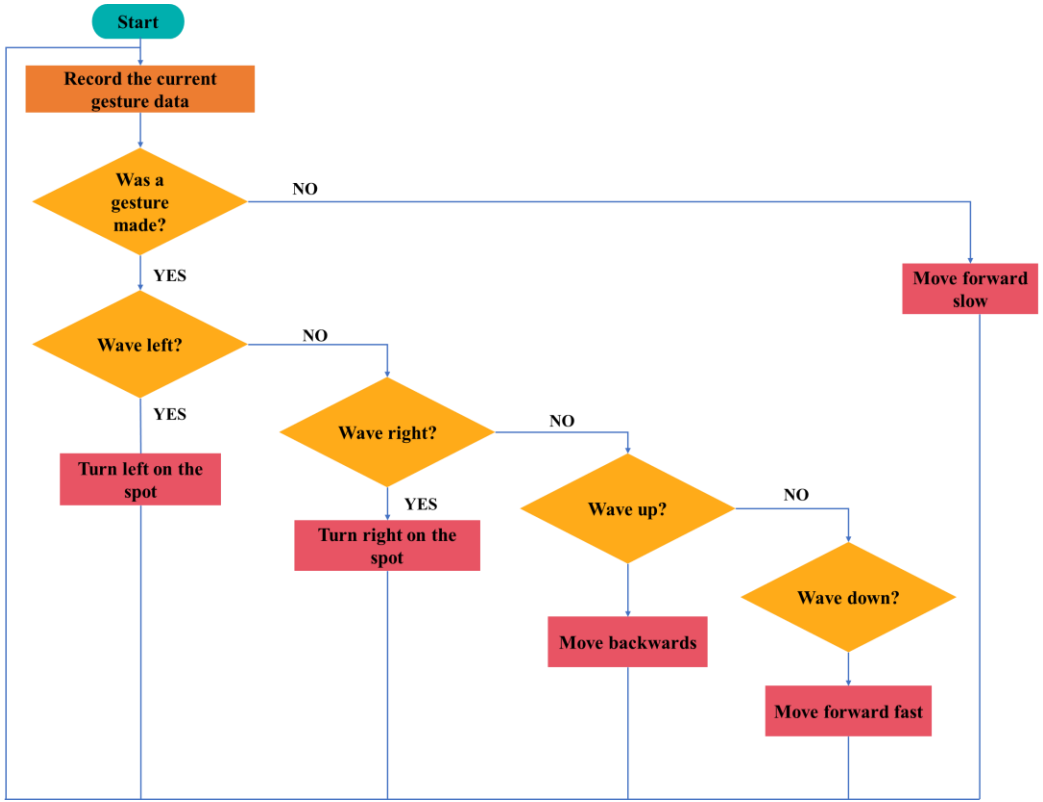


New Knowledge



Assemble a gesture control car according to the construction manual, so that the robot can recognize different gestures and move.

Practice | Programming



The robot moves forward slowly, and executes the corresponding movement program after recognizing the specified gesture. When the car receives the command to move forward slowly, it should maintain the current movement command for a period of time.

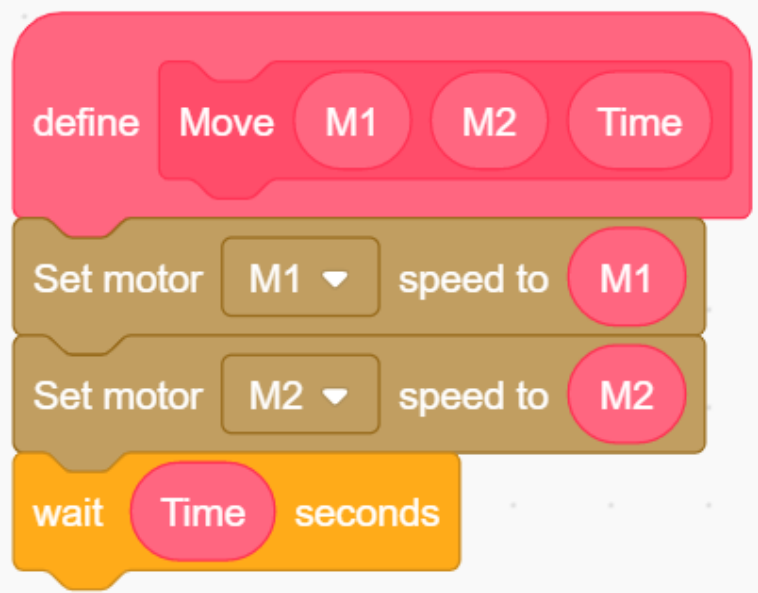
Practice | Programming



Read the data

Read the data of the gesture sensor and store it in a variable.

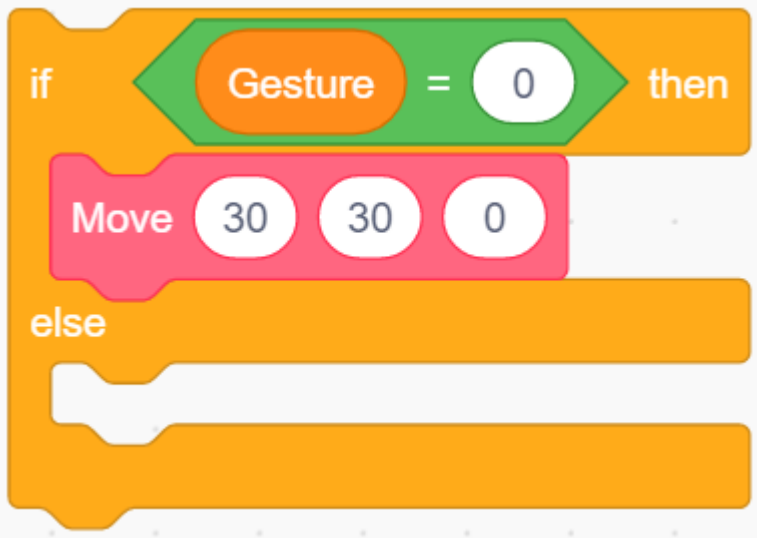
Practice | Programming



Movement function

Through self-made building blocks, create a movement function, this function has three parameters, namely M1, M2 and Time.

Control the speed of M1, the speed of M2 and the time of movement respectively.

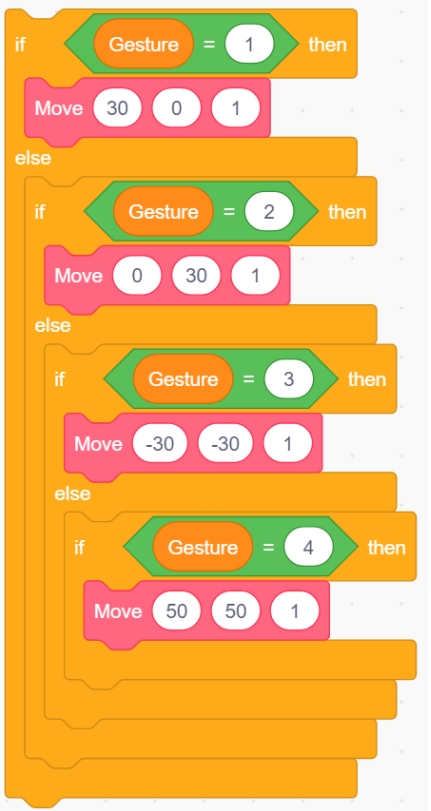


The Judgment of Gesture

When there is no gesture, the robot moves forward slowly.

Here, in order to better receive gesture information, no waiting time is required.

Practice | Programming

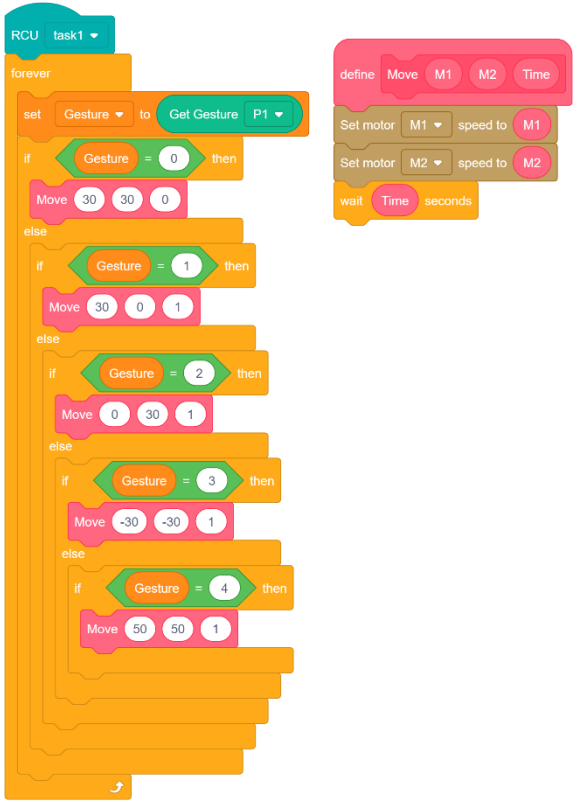


The Judgment of Gesture

When there is a gesture, the gesture type is judged in turn, and if the gesture is satisfied, the corresponding mobile program is executed.

Both speed and time can be modified according to the actual movement situation.

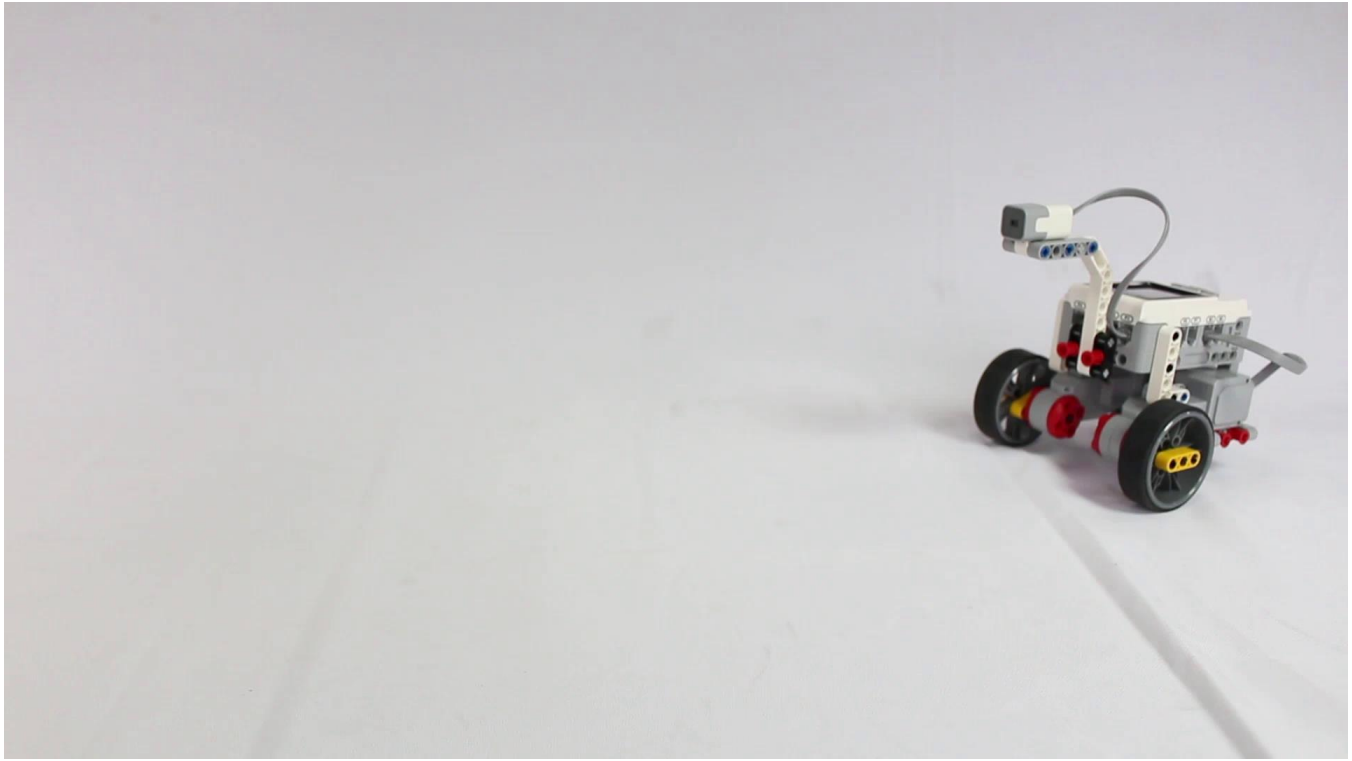
Practice | Programming

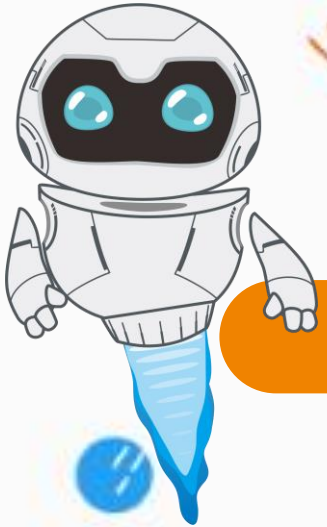


Integrate programs

Integrate the above programs according to the flowchart.

Practice | Programming





Results

Program Optimization

This class realizes the function of the robot to recognize the movement of gestures. Under different gestures, there are corresponding movement strategies.

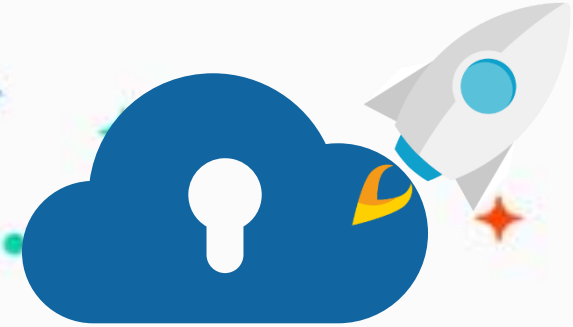
Next, modify the program to realize the function of stopping movement.

Requirement: Set any gesture as a stop movement gesture.

Further Reading



In addition to gesture control cars, eye tracking technology has also been applied to cars. In order to ensure the core solution of vehicle driving safety, this technology judges the driver's attention by monitoring the relative movement of the driver's eyeballs. With the continuous development of artificial intelligence technology, the driving control and driving safety of automobiles have been improved unprecedentedly.



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Thanks!

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