

02 -Multiple Speed Racing Car

Basic Teaching Information

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| Teaching facility | AI Module 1s | Teaching mode | Project-based learning | Class duration | 90 minutes |
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Teaching Objectives:

1. Master the construction of dual-motor multiple speed racing car;
2. Learn how to use touch sensor;
3. Learn how to use "wait until" module and "wait...secs." module;
4. Expansion: how parallel programs work.

Teaching difficulties:

1. Dual motor multiple speed car chassis is the core of this project;
2. Learn how to use touch sensor;
3. Learn how to use "wait until" module and "wait...secs." module.

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Focus

Variator is one of the main components of automobile transmission system. The automobile is very complex in practical use, such as starting, accelerating, decelerating, climbing and reversing, etc. It is required that the driving force and speed of the car can change within a certain range. So you can design a multiple speed car.



Exploration

There are many kinds of variators in the car. In order to deal with different environments, normally the gearbox achieves different torque and speed switching by the complex transmission structure. In this lesson, we will learn how to control the speed of the car by programming.

1. The chassis structure of the racing car is dual-motor differential chassis;
2. Using the touch sensor to switch car speed;
3. Using the touch sensor as stop button.

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Creation

1. Choose the general chassis as the chassis of the dual-motor differential car;
2. Two closed-loop motors as the power of the car;
3. Touch sensor as acceleration and stop button;
4. Tire and wheel as rear wheel of car;
5. 24-tooth straight gear as the front wheel of the car;
6. Square beams and other decorative parts to build the body of car;
7. controller.



Programming

Learning and understanding “wait until” module and “wait...secs.” module.

Extension: parallel program.

After the program starts running, enter the loop, “wait until” module. After the touch sensor is pressed, wait 0.5 seconds for the car to start at 20% power.

When the touch sensor is pressed again, wait 0.5 seconds for the car to run at 40% power.

When the touch sensor is pressed again, wait 0.5 seconds and let the car run at 40% power. Press again, the power increases to 60%.

Note: Waiting for 0.5 seconds is to avoid misjudgment caused by delay between button press and button release.

Extension: Add a second touch sensor through a parallel program to control car stop.

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