ENJOYAI 2024

CLOSING CEREMONY OF SPORTS

Troubleshoot Your Robot

Objectives:

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- 1. Learn the basic methods of judging whether a robot is prone to failure
- 2. Learn how to fix grayscale sensors and motors
- 3. Learn how to strengthen the robot's structure







In the previous lesson, we have tested the performance of our robot. Let's have a quick review!



Review

Test Success Rate

If we find that the success rate is not high, what can we do?



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Sometimes in the competition, things may not go as we expect. The robots may get stuck or some parts of it may get broken or fall off. So, we need to learn how to fix our robot.



Troubleshooting

- 1. Learn the robot's structure and the position of its components, and know how to disassemble or reassemble the robot.
- 2. Learn how to fix grayscale sensors and motors.
- 3. Learn how to strengthen the robot's structure.



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Structural Error



When some parts of the robot fall off in the competition, we need to quickly reassemble the robot. So first, let's have a look at the robot's structure.



Common structural errors:

- 1. The grayscale sensor falls off (pay attention to its original position).
- 2. The gear or the double bolt is broken, and the gear cannot mesh as a result.
- 3. The axle bends or the axle sleeve is too tight or too loose, making the wheel not in the right place.

Disassemble the robot and then try to reassemble it. Let's see who can do it!

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Grayscale Sensing Error



Sometimes in the competition, the grayscale sensor may get broken.

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Grayscale Sensing Error



In this case, we need to check whether the grayscale detection feature still works. To do so, we need first connect the grayscale sensor to the controller.

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Grayscale Sensing Error



You can write a program to complete grayscale detection.

Grayscale Sensing Error



- 1. Download the program to the controller. Follow the prompts on the controller screen.
- 2. Press the power on button, and you will hear an audio instruction to place the grayscale sensor on the black line. Then, press the power on button again.
- 3. Put the grayscale sensor onto the light-colored surface, and then press the power on button.
- 4. If the audio says that the detection is finished, the grayscale detection feature is normal.



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Watch the following video to learn how to do it.





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Strengthen Robot's Structure



No one wants to repair the robot again and again during the competition, right? So, let's strengthen the robot's structure in advance!

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Strengthen Robot's Structure



Some parts of the robot are not securely installed and may come loose. To fix that, we can attach them to several places on the robot. This multiplies the hold on the parts, like interlocking them, which makes the whole robot sturdier.

Let's strengthen the robot's structure!

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Challenges accepted!



Bravo! You've troubleshooted all the errors. Let's see if you can still do it in a practice competition!



Give it a go!

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