

Homework 03/18/2023

Q1: PID Line Follower + Replayer

Write a class called 'LineFollowAgent'.

In this class, there are three methods:

1. constructor method: def __init__(self, color_port, motor_port1, motor_port2, force_port)

In the constructor method, color_port means the port number of color sensor; motor_port1 and motor_port2 refer to the two ports used by the motor_pair; force_port is the port number connecting the force sensor.

2. def PIDLineFollower(self)

This method is used to run the PID line following function.

3. def PIDLineFollowReplay(self)

This method is to replay the trace of the driving base which was run last time.

The following is the testing code for the LineFollowAgent class:

```
agent = LineFollowAgent('A','B','C','D')
while True:
    if(agent.hub.right_button.was_pressed()):
        agent.PIDLineFollowReplay()
    if(agent.force_sensor.is_pressed()):
        agent.PIDLineFollower()
```

Testing Effect:

After the program starts, you put the driving base on a black line. Then, as long as you press the force_sensor button, the driving base starts running the PIDLineFollower() to follow the line. When it's moving on the line, you can click the hub's left_button to stop its moving. Then, there are two choices: if you click right_button, the driving base will replay its behavior (i.e., the trace he just moved on the line) based on its "memory"; if you click the force_sensor, it will clean its memory and run the PIDLineFollower() again to restart the line-following task.

For more details, please check the video I shared in the wechat group.