

COLOUR SENSOR TEST

GROUP 4

2nd December 2016
Verison 1

Abstract

This test uses the RGB values on the tools section of the brick. We are trying to figure out what will condition will correctly read a blue styrofoam block. We figured that out to be that the second value must be greater than the first value.

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1 BACKGROUND

1.1 Edit History

Jake Zhu: 2016-10-28, Initial set up

Mamoun Benchekroun: 2016-11-11, Added abstract section

Jake and Mamoun: 2016-11-24:, Added Procedure, Expected Result and Added Table

Jake Zhu: 2016-11-30, Added abstract

1.2 Test Information

Tester: Mamoun and Jake

Author: Mamoun and Jake

Hardware Version: 3.02

Software Version: RGB Test in Tools Section of the EV3 Brick

2 GOAL

To see whether the lighting environment on the second floor affects object detection.

3 PROCEDURE

Setup/Assumptions:

1. Assume that the robot has been built with the light sensor on the centre of the robot.

Test:

1. Upload the code onto the robot
2. Push the button to start the program
3. On the EV3 brick, click Tools - Test Sensors - Port Number - EV3 Color - RGB
4. Put the block at a distance of 0.5 cm from the block
5. Record the RGB values. If the second value is higher than the first value, a blue block is detected.
6. Repeat the previous two steps increasing 0.5 cm each time in order to find out the largest distance we can detect a block.

7. Repeat steps 2-6 at different lighting environments. Five tries should be run with a piece of paper covering the sensor. Record time and the intensity of sunlight for each trial.

4 EXPECTED RESULT

We expect that there will be different values for each of the colour variables in order to differentiate between a blue block and a wooden block.

5 TEST REPORT

5.1 WOODEN BLOCK

Distance	Red	Green	Blue
0.5	0.1107	0.0602	0.0373
1.0	0.0833	0.0485	0.0313
1.5	0.0382	0.0196	0.0147
2.0	0.0313	0.0166	0.0127
2.5	0.0274	0.0147	0.0127
3.0	0.0206	0.0098	0.0072
3.5	0.0137	0.0058	0.0049
4.0	0.0107	0.0049	0.0039
7.0	0.00291	9.8002	9.8039

5.2 BLUE BLOCK

Distance	Red	Green	Blue
0.5	0.0686	0.1058	0.0539
1.0	0.0500	0.0794	0.0450
1.5	0.0303	0.0480	0.0323
2.0	0.0225	0.0353	0.0255
2.5	0.0156	0.0235	0.0176
3.0	0.0117	0.0176	0.0147
3.5	0.0098	0.0137	0.0107
4.0	0.0069	0.0099	0.0088
7.0	0.0030	0.0029	0.0039

5.3 BLUE BLOCK WITH PAPER

Distance	Red	Green	Blue
2.0	0.0264	0.0382	0.0294
3.0	0.0157	0.0198	0.0176
4.0	0.0098	0.0127	0.0118

NOTE: We realised after 3 trials that putting a piece of paper in front of the sensor may actually cause the piece of paper to fold because of the contact with the block. Thus detecting the wrong colour at any given contact, which is unreliable.

6 CONCLUSION

Our tests verify that in order to detect the blue block, the second value would have to be greater than the first value in order to be consistent in object identification.

7 ACTION

The condition for our object identification is that if the second value is greater than the first RGB value, the block detected is a blue block.

8 DISTRIBUTION

Software Team