STATIC COLLECTOR TEST

GROUP 4

1st December 2016
Version 4

Abstract

This test aimed to simulate the robot with a static collector driving either straight into a block for collecting, or using a shifting motion to collect the block. The design successfully collected the block in all cases when using the shifting motion, but failed a significant number of times when simply driving straight.

Contents

1 BACKGROUND

1.1 Edit History

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

Jake Zhu: 2016-11-05, Made testing case based on time to test efficiency and created a separate document for each design.

Jake Zhu: 2016-11-05, Idea scraped. Hardware team wants qualitative data. Merged all the Collector Tests.

Quentin Norris: 2016-11-05, Tested and wrote out qualitative data for static collector. Evaluated two possible software options.

Jake Zhu: 2016-11-07, Added Conclusion

Benjamin Willms: 2016-11-13, Edited all sections to better represent the test that was performed.

Benjamin Willms: 2016-11-14, Added the abstract

1.2 Test Information

Tester: Quentin

Author: Quentin, Ben and Jake

Hardware Version: Static Collector

Software Version: N/A

2 GOAL

To see whether the static collector can successfully collect blocks at random positions and orientations in front of itself.

3 PROCEDURE

Setup:

1. Build a prototype of the collector.

Test:

1. Place the blocks at random locations and orientations in front of the collector. Ensure several of these orientations is 45 degrees.
2. Slowly move the collector towards the block in a straight motion, or in a fidgeting motion
3. See if the block is oriented to 0 degrees and placed flush with the back wall of the collector

4 EXPECTED RESULT

It is expected that the static collector will successfully collect the blocks in all cases with the fidgeting motion, and almost all cases (save possibly the 45 degree block possibility) with the straight motion.

5 TEST REPORT

5.1 Static Collector

We are testing two possible software decisions which will influence the effectiveness of the collector. Option 1 is driving into the block with a fidgeting motion; that is with only one wheel turning at a time so it is constantly changing the direction of the block. The second is simply driving straight into the block.

Results of testing option 1, driving into the block with the fidgeting motion:

Trial	Success?
1	True
2	True
3	True
4	True
5	True
6	True
7	True
8	True
9	True
10	True

Results of testing option 2, driving straight into the block:

Trial	Success?
1	True
2	False
3	False
4	False
5	True
6	True
7	False
8	True
9	False
10	True

Some successful results others not. The block sometimes funnels into the collector, and gets stuck partially on the side, and not flush with the back wall. This also fails when the block is centered, but at the 45 degree orientation, as expected.

6 CONCLUSION

The entire idea behind this design is to use the angles on the collector to funnel in the block. Its effectiveness is entirely dependent on how the robot runs into the block and the block's orientation. Clearly from the data the most effective software decision is that of the fidgeting motion. If we select the static collector to use we should implement this in the code.

7 ACTION

This option works better when the motion towards the block is fidgeting. We are considering using this option in order to collect the block.

8 DISTRIBUTION

Hardware Team, Software Team