TESTING – Integration Test

Project: Design an Autonomous Robot

Task: To design an autonomous robot that is capable of navigating to a predetermined position while avoiding obstacles and firing objects at two targets. This is to be done in the shortest time possible.

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Tester: Gwyneth Pang

Software Version: v4.0

Hardware Version: v4.0

Goal: This test will test the obstacle avoidance efficiency in the scope of the beta demo.

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# Purpose

This test will test the integration of the v4.0 software with the v4.0 of the hardware, in order to ensure that they work well together.

# Objectives

The objective of this test is to ensure the integration of the hardware and software. It will test how well the two interact with each other. In the best case scenario, the robot will run the course perfectly without any problems. In the worst case, the mechanical and the software will be unable to interact with each other, and will cause significant loading and errors.

# Procedure

1. Run the integrated system (similar 12x8 grid)
2. Record obstacle avoidance
3. Recording loading
4. Record shooting (accuracy)
5. Record the total time
6. Repeat 10 times

# Expected Results

In the best case, the integration will work perfectly without any issues. In the worst case, the integration will make the different systems to break. However, it is expected that the robot be able to run perfectly, since every part of the software was tested individually in order to assure that it will work for all cases, and the mechanical system is mostly independent of the software system.

# Format of Output Required

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Run | Localization | Navigation/Obstacle Avoidance | Loading | Shooting (hit target?) | Time (minutes) |
| 1 | Pass | Pass | Pass | 2/3 | 2:05 |
| 2 | Pass | Pass | Pass | 3/3 | 2:00 |
| 3 | Pass | Pass | Pass | 2/3 | 2:01 |
| 4 | Pass | Pass | Pass | 3/3 | 2:01 |
| 5 | Pass | Pass | Pass | 3/3 | 2:03 |
| 6 | Pass | Pass | Pass | 2/3 | 2:09 |
| 7 | Pass | Pass | Pass | 3/3 | 2:00 |
| 8 | Pass | Pass | Pass | 2/3 | 2:02 |
| 9 | Pass | Pass | Pass | 3/3 | 2:01 |
| 10 | Pass | Pass | Pass | 3/3 | 2:06 |

# Sample Calculations

No calculations

# Test Report

The test was a success, since the robot has successfully integrated all the systems and passed every phase of the beta demo. However, the shooting has potential to be improved, due to the lack of consistency.

# Conclusion

In conclusion, the integration test has very positive results, where all the phases were successful with a time of about 2:03 minutes. Thus, the robot is functional for the new hardware and software designs.

# Action

This test report should be kept within the software and hardware development.

# Distribution

This part of the project belongs to the software development and the mechanical development.