TESTING DOCUMENT

Project: ECSE 211 Final Design Project – Team 6
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Author: Alex Hale
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[22/10/2017] Alex Hale: created document
[19/10/2017] Xu Hai: Recorded the information about Test 1.
[20/10/2017] Xianyi Zhan: Recorded the information about Test 2.
[21/10/2017] Xu Hai: Recorded the information about Test 3.
[21/10/2017] Xu Hai: Recorded the information about Test 4.
[21/10/2017] Xu Hai: Recorded the information about Test 5.
[22/12/2017] Alex Hale: transferred to Google Drive for easier collaboration; made some grammatical and formatting changes

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1.0 Requirements

1.1 Project Requirements

See Requirements Document

1.2 Testing Requirements

- Each test should note: date, tester(s), author, hardware version, software version, goal, procedure, expected result, test report, conclusion, action and distribution.
- Each test should have at least 10 independent trials and record results in a table. Compute Euclidean distance, mean value and standard deviation if possible.
- Potential weak points should be tested.
- Extreme cases of the specifications should be tested.
- Tester should have a clear, expected outcome for each test.

1.3 General Test Procedures

- Test whether the hardware design keeps the robot stable when moving and turning (extreme cases included, e.g. high speed).

- Test whether the hardware design allows the robot to mount and traverse the zip line successfully (extreme cases included, e.g. high speed).
- Test whether the robot gets stuck when it finishes traversing the zip line.

More details will be added according to ongoing software design and development.

2.0 Tests

Test #1 - Hardware Stability
Date: 19 October 2017
Tester: Xu Hai
Author: Xu Hai
Hardware version: robot version lab 5 1.0
Software version: N/A
Goal: Determine if the hardware design can keep stable when the robot is moving and turning.

Procedure: The robot should be placed on the ground and then get instructed to move forward, backward and turn around. Each direction should also be tested with speed of 100, 200 and 300, each case should be tested at least 5 times.

Expected Result: The hardware design should keep stable all the time.

Test Report: The test was performed totally 60 times following the protocol described above. During the test, the robot can keep stable at most the time (57/60). However, sometimes left motor can drop off when put the robot on the ground. In summary, the left motor dropped off on 3 of the 60 tests.

Conclusion: The hardware design can keep stable when the robot is moving and turning, but the design of left motor connection is not sufficiently stable, potential problem exists.

Action: This test report should be sent to the hardware team to review the hardware design. The Gantt chart should be updated to show the revised tasks.

Distribution: Hardware development, project management.

Test #2 - Hardware Stability II
Date: 20 October 2017
Tester: Xu Hai, Xianyi Zhan
Author: Xianyi Zhan
Hardware version: robot version lab 5 1.1
Software version: N/A

Goal: Determine if the hardware design can keep stable when the robot is moving and turning. Check if the left motor dropping off problem has been solved.

Procedure: The robot should be placed on the ground and then get instructed to move forward, backward and turn around. Each direction should also be tested with speed of 100, 200 and 300, each case should be tested at least 5 times.

Expected Result: The hardware design should keep stable all the time without any hardware issue.

Test Report: The test was performed totally 60 times following the protocol described above. During the test, the robot can keep stable at most the time (60/60). During the entire testing process, the left motor does not dropping off.

Conclusion: The hardware design can keep stable when the robot is moving and turning, the left motor dropping off problem has been solved.

Action: This test report should be sent to the project manager and documentation manager. The Gantt chart should be updated to show the project can move on to the next stage. The test team will start to testing the zipline crossing ability of the robot.

Distribution: Project management, Documentation management, Testing team.

Test #3 - Zipline Crossing
Date: 20 October 2017
Tester: Xu Hai, Xianyi Zhan
Author: Xu Hai
Hardware version: robot version lab 5 1.1
Software version: N/A
Goal: Determine if the hardware design can make the robot mount and traverse the zip line successfully.

Procedure: The robot should be placed in front of the zip line and then get instructed to mount and traverse it. The test should be performed with speed of 200 and 300. Each case should be tested at least 10 times.

Expected Result: The hardware design can make the robot mount and traverse the zip line successfully all the time.

Test Report: The test was performed totally 20 times following the protocol described above. In summary, with the speed of 200, the robot dropped off the zip line on 1 of 10 runs. With the speed of 300, the robot dropped off the zip line on 0 of 10 runs. Notice that the supporting structure of the zip line travelling motor is unstable.

Conclusion: The robot performance did not meet the specified outcomes. The hardware design for the zip line is unreliable.

Action: This test report should be sent to the hardware team to review the hardware design. The Gantt chart should be updated to show the revised tasks.

Distribution: Hardware development, project management.

Test #4 - Zip Line Crossing
Date: 20 October 2017
Tester: Xu Hai, Xianyi Zhan
Author: Xu Hai
Hardware version: robot version lab 5 1.2
Software version: N/A
Goal: Determine if the hardware design can make the robot mount and traverse the zip line successfully.

Procedure: The robot should be placed in front of the zip line and then get instructed to mount and traverse it. The test should be performed with speed of 200 and 300. Each case should be tested at least 10 times.

Expected Result: The hardware design can make the robot mount and traverse the zip line successfully all the time.

Test Report: The test was performed totally 20 times following the protocol described above. In summary, the robot mounts and traverses the zip line successfully all the time.

Conclusion: The robot performance met the specified outcomes. The hardware design for the zip line crossing is reliable.

Action: This test report will be sent to the hardware team to see the result. The Gantt chart should be updated to show the revised tasks.

Distribution: Hardware development, project management.

Test #5 - Zip Line Sticking at end of Crossing
Date: 20 October 2017
Tester: Xu Hai, Xianyi Zhan

Author: Xu Hai
Hardware version: robot version lab 5 1.2
Software version: N/A
Goal: Determine if the hardware design can make the robot avoid stuck when it finishes traversing the zip line.

Procedure: The robot should be placed in front of the zip line and then get instructed to mount and traverse it. The test should be performed at least 10 times

Expected Result: The hardware design should make the robot avoid stuck when it finishes traversing the zip line all the time.

Test Report: The test was performed totally 10 times following the protocol described above. In summary, the robot did not get stuck during the test.

Conclusion: The robot performance met the specified outcomes. The hardware design for the zip line crossing is reliable.

Action: This test report should be sent to the hardware team to see the result. The Gantt chart should be updated to show the revised tasks.

Distribution: Hardware development, project management.

3.0 Glossary of terms