AVC Testing Documentation

Quadrant 1: Opening Gate

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| --- | --- | --- | --- | --- |
| Test: | What happened | Why | Potential Solutions | Comments |
| Robot to receive and transmit password | Robot failed to open the gate on its own. | Robot was failing to send the password back to the server properly | Fix the solution - see gate opening code in github repo branch Week3 |  |
| Robot to receive and transmit password | Robot managed to open the gate successfully on its own. | Robot successfully sent the password back in the correct manner | No additional solutions needed |  |
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Quadrant 2: Curved Path

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| Test: | What happened | Why | Potential Solutions | Comments |
| Test kp at 0.5, 0.75, 1.5, 1.0 | For the kp values at 1.0, 1.5, the robot overshot the white line. For the kp values at .5 and .75, robot undershot white line by a significant amount | The error calculation value of kp was not tuned enough | Test kp at smaller increments like increasing from 1.0 up by increments of 0.1 or even 0.05 if 0.1 is not enough | This indicated a more precise kp value was needed |
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Quadrant 3: Straight Path with Junctions

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| Test: | What happened | Why | Potential Solutions | Comments |
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Quadrant 4: Maze

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| Test: | What happened | Why | Potential Solutions | Comments |
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Hardware Testing

Component 1: Motors (####Note in week 1, one of the motors was malfunctioning and therefore had to be replaced. In week 3, one of the motors were jammed and once again had to be replaced)

Test: that motors initially worked then test again when the tracks are fitted to the robot by running them in different settings. First test was to test that they worked. Second test was to gauge the power and reliability of the two provided motors. Third test tested how they worked with turning.

Outcome: First test was a success. Second test showed that one of the motors almost didn’t even work. Third test (included new motor as a replacement for weak motor) showed that the two motors worked well enough apart from a speed ratio of 175:100.

Potential Solutions: had to replace one motor due to poor working order.

Comments: upon testing the robot on the actual course the other original motor jammed and had to be replaced.

Component 2: Tracks

Test: How tight they are and how well they work.

Outcome: tracks weren’t originally tight enough, afterwards the tracks worked well.

Potential Solutions: Tighten the tracks.

Comments:

Component 3: Wheels

Test: Compatible with tracks and stable enough to efficiently move the robot.

Outcome: wheels worked well and have had no problems

Potential Solutions: none needed

Comments:

Component 4: Axles (#### note in week 2 axles were not stabilising and therefore had to be replaced)

Test: Turning ability by turning the robot to each side, how straight they were held to ensure robot could move straight

Outcome: robot moved straight but failed to turn properly, further tests showed instability in the original axis design.

Potential Solutions: replaced the axle and improved the stability of the mounts for the axis to ensure robot moved well.

Comments:

Component 5: Camera

Test: Camera was tested using raspivid -o in the first week. Camera was also tested in the second week using C++ code such as init() and save\_picture() methods to ensure that a proper image is being captured by the camera.

Outcome: First week tests showed that the camera was working with no problems after multiple runs of the camera. Second week tests showed that the camera was able to capture images and read from them well enough to follow a white line.

Comments: The camera works well with no problems but will have further testing as we test it along more in the maze.

Component 6: IR Sensors

Test: (Yet to be implemented)

Outcome:

Potential Solutions:

Comments