**3.** **Requirements**

The robot will need to traverse a line that resembles the shape of a box and change colors at the start and end of the endurance test. The robot will also need to speak at the end of the test before going offline.

**Priority Definitions**

* Priority 1: The robot MUST trace the outline of the box and change colors at the end and start of the test; The robot will also need to speak at the end of the test.
* Priority 2: The robot will need to have multiple attempts to get the correct path at the start of the test to have the most accurate pathing.
* Priority 3: A “nice to have” feature would be to have a way to align the robot correctly every time without multiple attempts to get the best and most accurate pathing.

**3.1 Functional Requirements**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Req#** | **Requirement** | **Comments** | **Priority** | **Date Rvwd** | **SME Reviewed / Approved** |
| **ENDUR\_1** | **Driving** | **Needed to be able to drive around the track** | **1** | **10/25/22** | **Approved** |
| **ENDUR\_2** | **Light** | **Need to glow green in the beginning and Red at the end** | **3** | **10/25/22** | **Approved** |
| **ENDUR\_3** | **Audio** | **Needs to speak in the beginning and the end** | **2** | **10/25/22** | **Approved** |
|  |  |  |  |  |  |

**3.2 Security**

We used a password to get into the sphero account

**3.2.1 Protection**

To protect the robot’s code integrity we would use a private connection that would need an admin password to get approval to operate the robot. The robot will also have an activity log that would show the user’s ip address and location of the device that was used to activate and use the robot. We would also have at least 2 approved admins on set to watch the robot be used. The robot will also have constant data logging to make sure if anything goes wrong that there will be data to find out where the error occurred.

**3.2.2 Authorization and Authentication**

We would use PubCookie to authenticate users and grant them access.

**4. Requirements Confirmation / Stakeholder Sign-Off**

|  |  |  |
| --- | --- | --- |
| Meeting Date | Attendees | Comments |
| October 25th, 2022 | Richard K, Roman D, Shabbar S | After as few errors we were able to get the robot to successfully and accurately complete its tasks. |

**5. System Design**

**5.1 Algorithm**

See attachment

**5.2 System Flow**

See attachment

**5.3 Software**

We used the Sphero box coding and api to code the robot.

**5.4 Hardware**

We used the Sphero given to us and the blue tape shaped in a box in the CS room.

**5.5 Test Plan**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Reasons for Test Case** | **Test Date** | **Expected Output** | **Observed Output** | **Staff Name** | **Pass / Fail** |
| **First test to get the robot on the correct path** | **10/25** | **The robot would follow the blue line and stop at the end** | **Robot first didn't make it all the way or would not follow the line accurately but after multiple attempt made it** | **Richard k, Roman D, Shabbar S** | **Failed 3 times Then passed** |
| **Test to get the robot to pivot** | **10/25** | **Robot would pivot on the line and align the correct way** | **Robot would often not pivot the correct way** | **Richard k, Roman D, Shabbar S** | **Failed several times but was able to successfully pass** |
| **Test to get the robot to follow the shorter line** | **10/25** | **Robot would pivot and follow the correct path** | **Robot would stray off line but was fixed** | **Richard k, Roman D, Shabbar S** | **Failed twice then was able to pass** |
| **Test to get the robot to finish the course** | **10/25** | **Robot would reverse the steps previously and complete the course** | **The robot strayed off the line but after re-aligning would make it through without any problems successfully** | **Richard k, Roman D, Shabbar S** | **Failed once then was able to pass** |
|  |  |  |  |  |  |

**5.6 Gantt Chart**

See attachment

**5.7 Staffing Plan**

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Role** | **Responsibility** | **Reports to** |
| **Richard** | **Writer/Designer** | **Filling info for design** | **Each other** |
| **Shabbar** | **Coder/Designer** | **Coding/Algo/FLchart** | **Each other** |
| **Roman** | **Manager/Designer** | **Helping with a bit of everything** | **Each other** |