Sprint 1 - Endurance Design Document

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# Executive Summary

## Project Overview

The robot must successfully travel around the periphery of HH208 (circumnavigate). A clear path will be provided from each outside wall. The robot will start from the yellow square with blue tape. The robot should start with a green light and speak ‘ready set go’ and stop with a red light and speak ‘I’m and I need water’. The robot must travel to each yellow floor and turn right at the center of each tile. The robot must return to its starting location. The ion. The robot should not collide with any objects as it goes around the room. Points deducted if the robot does not light and speak at the start and finish, if it collides with anything, or if it does not finish in the square where it started.

## Purpose and Scope of this Specification

The purpose of the project is to successfully complete the endurance test.

In scope

* Endurance Test

Out of Scope

* Accuracy Test
* Agility Test

# Product/Service Description

## Product Context

This project is one part of three tests which will test the robot in three different categories; endurance, accuracy, and agility.

## User Characteristics

* Student
* Faculty Member

## Assumptions

The robot being used is the Sphero+.

## Constraints

Describe any items that will constrain the design options, including

* Can only use assigned block coding
* Set track
* Only one type of robot

## Dependencies

* Objects in its path
* Speed of the robot

# Requirements

## Functional Requirements

| Req# | Requirement | Comments | Priority | Date Rvwd | SME Reviewed / Approved |
| --- | --- | --- | --- | --- | --- |
| ENDUR\_01 | Start at yellow square |  | 1 | 10/19 | Michael |
| ENDUR\_02 | Start with green light |  | 1 | 10/19 | Michael |
| ENDUR\_03 | Say “ready set go” |  | 1 | 10/19 | Michael |
| ENDUR\_04 | Travel to each yellow tile |  | 1 | 10/19 | Michael |
| ENDUR\_05 | Turn right at the center of each tile |  | 1 | 10/19 | Michael |
| ENDUR\_06 | Return to starting location |  | 1 | 10/19 | Michael |
| ENDUR\_07 | Stop with a red light |  | 1 | 10/19 | Michael |
| ENDUR\_08 | Don't hit any obstacles |  | 1 | 10/19 | Michael |

## Security

### Protection

Specify the factors that will protect the system from malicious or accidental access, modification, disclosure, destruction, or misuse. For example:

* encryption
* activity logging

### Authorization and Authentication

Specify the Authorization and Authentication factors.

## Portability

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Feature** | **Description** | **IOS** | **Andriod** | **Chrome OS** | **Fire OS** | **Windows** | **macOS** |
| **System Requirements** | The minimum operating system, browser, or required hardware for each platform. | **OS Requirements:** **iOS 12.5.6+**  **Additional Requirements:** **Bluetooth 4.0+** | **OS Requirements:** **Android 8+**  **Additional Requirements:** **Bluetooth 4.0+** | **OS Requirements:** **Android 8+**  **Additional Requirements:** **4GB memory** **Bluetooth 4.0+** | **OS Requirements:** **Fire OS 7+**  **Additional Requirements:** **Bluetooth 4.0+** | **OS Requirements:** **Windows 10 2004(20H1)+** **Windows 11**  **Additional Requirements:** **64-bit** **4GB memory** **Bluetooth 4.0+** | **OS Requirements:** **macOS 10.15+**  **Additional Requirements:** **Bluetooth 4.0+** |

# Requirements Confirmation/Stakeholder sign-off

|  |  |  |
| --- | --- | --- |
| Meeting Date | Attendees (name and role) | Comments |
| 11/2/22 | Jason, Nicholas, Michael | Teammates work together well |

# System Design

## Algorithm

https://github.com/Nick141003/Endurance/blob/8545b6f8dfc0af6d822b93cd6468fbd33f2212df/Robotic%20Endurance%20Algorithm.docx

## System Flow

Develop a flowchart (and show here) that accurately depicts how your software application will act to fulfill the algorithm

## Software

Robot block coding (JavaScript)

## Hardware

The physical robot (Sphero+)

## Test Plan

| **Reason for Test Case** | **Test Date** | **Expected Output** | **Observed Output** | **Staff Name** | **Pass/Fail** |
| --- | --- | --- | --- | --- | --- |
| Straight Line Test | 11/2 | Reach first corner | Stopped short of first corner and drifted wide | Jason Galvao | Fail |
| Straight Line Test | 11/2 | Reach first corner | Reached | Jason Galvao | Pass |
| Right Hand Turn | 11/2 | Turn and reach the second corner | Reached | Jason Galvao | Pass |
| Complete Whole Course | 11/2 | Go around in rectangle | Drifted wide and hit object | Jason Galvao | Fail |
| Complete Whole Course | 11/2 | Complete the rectangle | Drifted wide | Jason Galvao | Fail |
| Complete Whole Course | 11/2 | Complete the rectangle | Completed the rectangle but drifted a little wide to the outside | Jason Galvao | Pass |
| Color and Speaking Test | 11/2 | Change colors and speak at the right spots | Completed | Jason Galvao | Pass |
| Refinement | 11/2 | Follow the line more closely | Completed the rectangle | Jason Galvao | Pass |

## Task List/Gantt Chart

[Sprint 1 Endurance Gantt project plan Template.xlsx](https://live365monmouth-my.sharepoint.com/:x:/g/personal/s1339198_monmouth_edu/EdilKSBAcjREmhhZqNcJ3L4BpRfYFm0dcA7nQ02fTh0EhQ?e=o1ejlM)

## Staffing Plan

| Name | Role | Responsibility | Reports To |
| --- | --- | --- | --- |
| Michael Cozzolino | Manager | Overviews project | Nicholas Stevens |
| Nicholas Stevens | Programmer | Creates and designs the code | Michael Cozzolino |
| Jason Galvao | Documenter | Edit and update documents | Michael Cozzolino |