Sprint 1 - Endurance Design Document

November 3, 2022

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1. Executive Summary

1.1 Project Overview

The robot will travel around the circumference of the blue tape on the ground of HH 208. It will light up and talk when specified and will stay on the course.

1.2 Purpose and Scope of this Specification

The purpose of this project is to successfully have the robot travel around the circumference of the blue tape on the ground of Howard Hall Room 208.

In scope

- Sphero follows the blue tape around the rectangle and stops where it began
- Sphero speaks appropriate speech at appropriate time
- Sphero changes color when beginning and when stopping

Out of Scope

The following are out of scope:

- When the sphero does not follow the blue line
- When the sphero does not talk at the specified time
- When the lights do not work properly

2. Product/Service Description

- This project is for Intro to Problem Solving (CS104-01)
- This Sprint of the project is due November 3, 2022

2.1 Product Context

- Independent; one part of triathlon
- 3 group members working on the same project
- Connected to a larger project but the part is independent

2.2 User Characteristics

- Students in CS 104-01
- 2 or fewer years of computing experience
- First time using Sphero Application

2.3 Assumptions

The robot is assumed to work as needed. Howard Hall Room 208 is assumed to be available when needed. The block code is assumed to work as needed. Team members are assumed to be available at the same times.

2.4 Constraints

Describe any items that will constrain the design options, including

- Operation of the robots
- Functionality of the robot
- Access to Howard Hall Room 208
- The Sphero Application
- Tape on the ground

2.5 Dependencies

List dependencies that affect the requirements:

- Must be in Howard Hall Room 208
- Must use the Sphero Application to control the robot

3. Requirements

3.1 Functional Requirements

For Example:

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
ENDUR_01	Robot travels along blue tape in a rectangular shape and returns back to original starting place.	Most important to get correct.	1	11/2	Lola Weis
ENDUR_02	Robot speaks statements at beginning and end of running program as well as changes color.	Necessary for full credit and easy to add once first priority is met.	2	11/2	Lola Weis
ENDUR_03	Robot stops on each corner to ensure proper turning	Not fully necessary, but will help robot to run smoothly and stay within blue tape.	3	11/2	Lola Weis

3.2 Security

There is a password to get onto the computer that contains the code for the Robot.

3.2.1 Protection

- A sphero account and password
- Authentication checks
- Github account and password

3.2.2 Authorization and Authentication

- You need a Sphero account with an email that has been authenticated.

3.3 Portability

- Code is entirely host dependent
- It uses Sphero block code
- The Sphero application can be used on both computers and mobile telephones

4. Requirements Confirmation/Stakeholder sign-off

Include documentation of the approval or confirmation of the requirements here. For example:

Meeting Date	Attendees (name and role)	Comments
10/25/2022	Lola, Ty, Baylor	Discovered the robot does not work properly, need to exchange for a new one.
11/1/2022	My group member names	confirmed…….

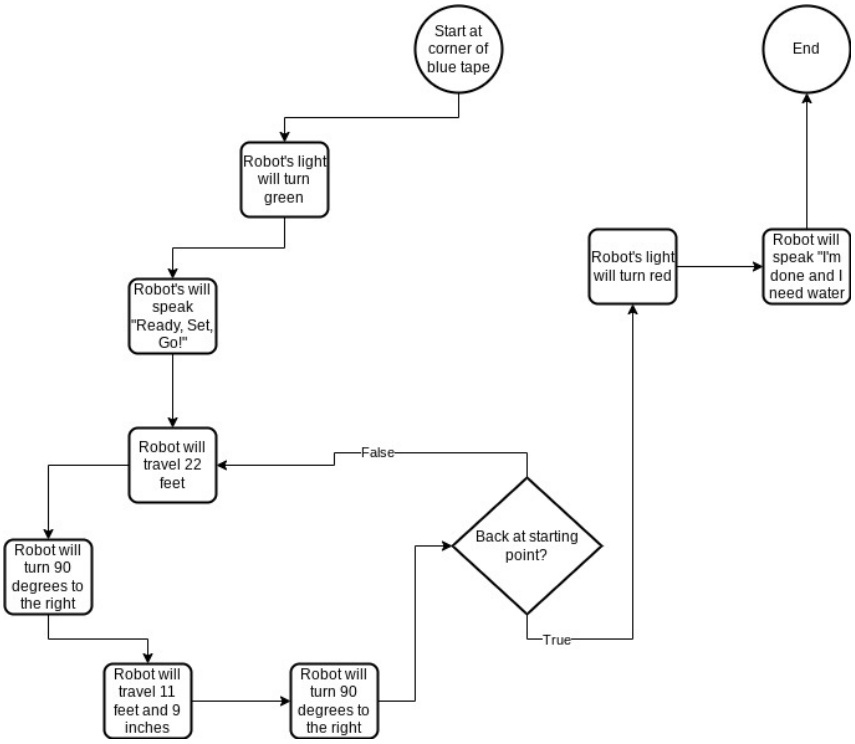
5. System Design

This section will provide all details concerning the technical design, staffing, coding, and testing the system

5.1 Algorithm

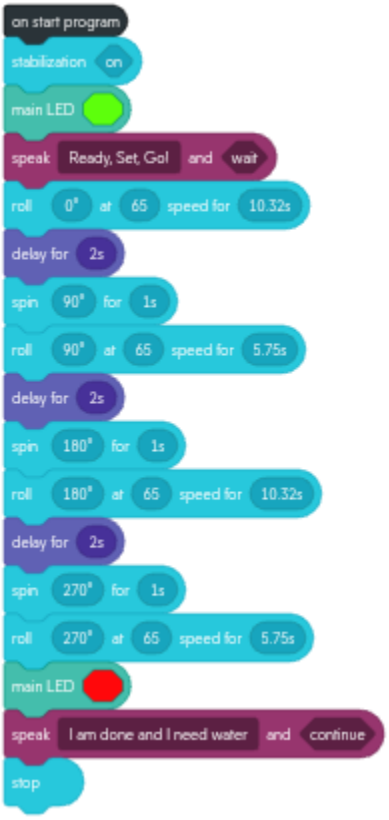
1. The robot will start at the yellow square with blue tape
2. The robot will start with a green light
3. The robot will say “Ready, Set, Go!”
4. The robot will travel 22 feet across the blue tape
5. The robot will turn right at the corner of the blue tape
6. The robot will travel 11 feet and 9 inches across the blue tape
7. The robot will turn right at the corner of the blue tape
8. Repeat steps 4-7 two times
9. The robot will return to starting point
10. The robot will turn red
11. The robot will say “I’m done and I need water.”

5.2 System Flow



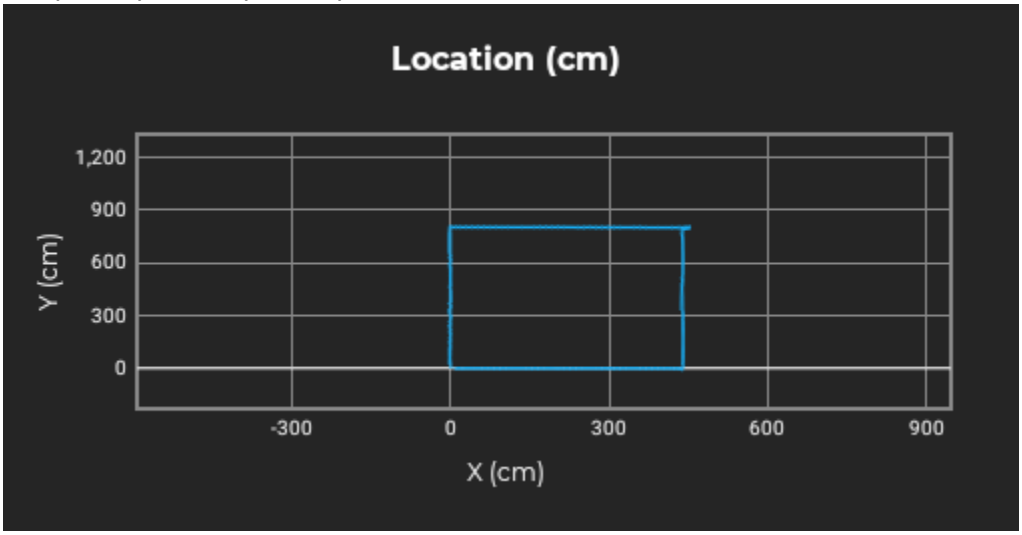
5.3 Software

Sphero block code, Sphero application, Github website



5.4 Hardware

Computer, Iphone, Sphero Spark Robot, Bluetooth

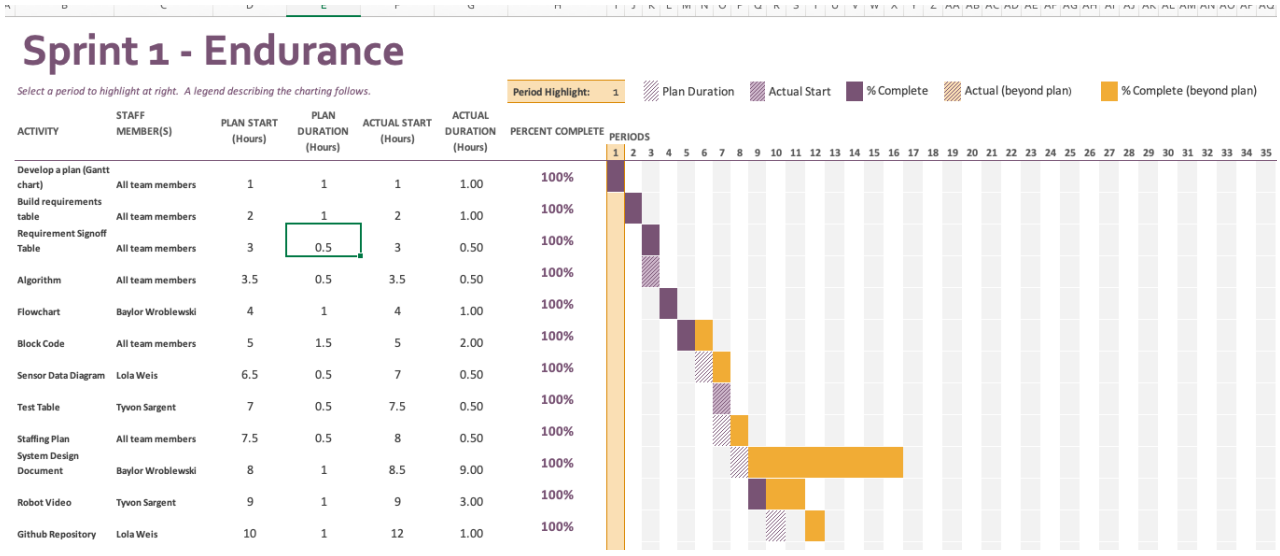


5.5 Test Plan

Include a test plan showing all unit tests performed for this application, Include test rational, test date, staff member, pass/fail status

Reason for Test Case	Test Date	Expected Output	Observed Output	Staff Name	Pass/Fail
Align aim	11/1	to go straight	did not go straight	Ty	fail
align aim	11/1	to go straight	Went straight	baylor	pass
distance	11/1	to hit the first corner	was short of the first corner	baylor	fail
distance	11/1	to hit the first corner	overran first corner	lola	fail
distance	11/1	to hit first corner	hit the first corner	ty	pass
angle	11/1	to turn to the next corner	turned the opposite way	baylor	fail
angle	11/1	to turn to the next corner	went straight	lola	fail
angle	11/1	to turn to the next corner	turned to the next corner	ty	pass
next corner	11/1	go straight to the next corner	went to the next corner perfectly	baylor	pass
last corner	11/1	turn and go straight to the endpoint	went to the last corner and endpoint	lola	pass
full run	11/1	full run on the line	full run perfect	ty	pass

5.6 Task List/Gantt Chart



5.7 Staffing Plan

Insert a chart/table that depicts the roles and responsibilities of each team member that worked on this project

Name	Role	Responsibility	Reports To
Baylor Wroblewski	Tech Coordinator	Coder, Robot owner	Lola

Name	Role	Responsibility	Reports To
Lola Weis	Planner, Organizer	Gantt chart, Github owner	Tyvon
Tyvon Ali Sargent	Tester	Videographer, Test planner	Baylor