Sprint 2 - Accuracy Design Document

November 15, 2022

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1. Executive Summary

1.1 Project Overview

The robot will travel around the circumference of the blue tape in the shape of a figure 8 on the ground of HH 208 five times. It will light up and talk at the end and will stay on the course throughout each cycle around the figure 8.

1.2 Purpose and Scope of this Specification

The purpose of this project is to successfully have the robot travel around the blue tape on the ground of Howard Hall Room 208 in the shape of a figure 8 five times and light and speak at the end.

In scope

- Sphero follows the blue tape around the figure 8 five times and stops where it began
- Sphero speaks once completing the five times around
- Sphero changes color to multicolor once it finishes

Out of Scope

The following are out of scope:

- When the sphero does not follow the blue line
- When the sphero does not complete all 5 times around
- 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 15, 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
ACCUR_01	Robot travels along the blue tape in the shape of a figure 8.	Most important to get correct.	1	11/9	Lola Weis
ACCUR_02	Robot travels along figure 8, five times and stops in the center, where it began.	Necessary for full credit, but not as important as getting the overall shape correct	2	11/9	Lola Weis
ACCUR_03	Robot speaks statements at the end of running program.	Necessary for full credit and easy to add once the first and second priorities are met.	3	11/9	Lola Weis
ACCUR_04	Robot lights up with multicolor at the end of the program running.	Necessary for full credit and easy to add once the first, second, and third requirements are met.	4	11/9	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
11/08/2022	Lola, Ty, Baylor	Achieved Requirements 1 and 2, confirmed
11/09/2022	Lola, Ty, Baylor	Achieved Requirements 3 and 4, confirmed

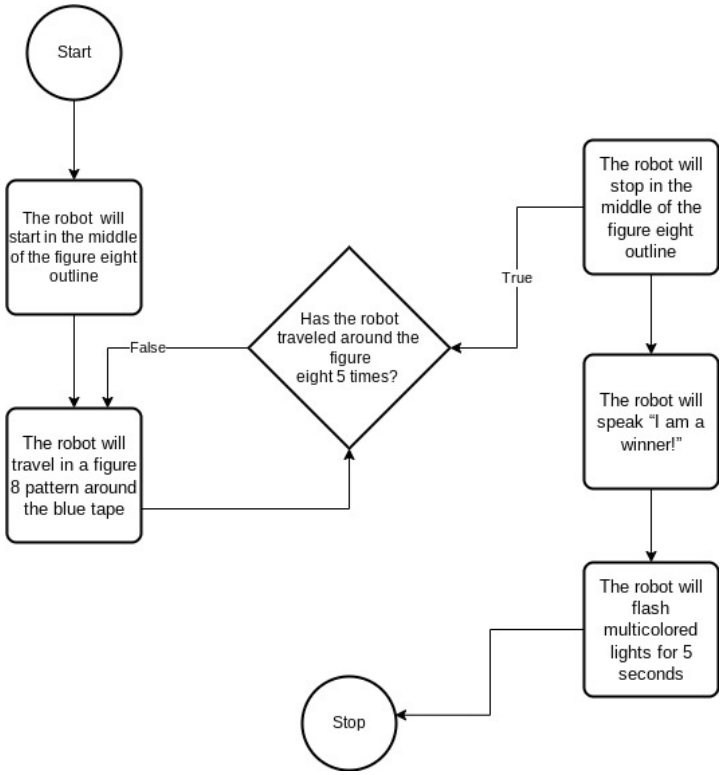
5. System Design

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

5.1 Algorithm

1. The robot will start in the middle of the figure eight outline
2. The robot will travel in a figure 8 pattern around the blue tape.
3. The robot will repeat step 2 five times.
4. The robot will stop in the middle of the figure eight outline.
5. The robot will speak “I am a winner!”.
6. The robot will flash multicolored lights for 5 seconds.

5.2 System Flow

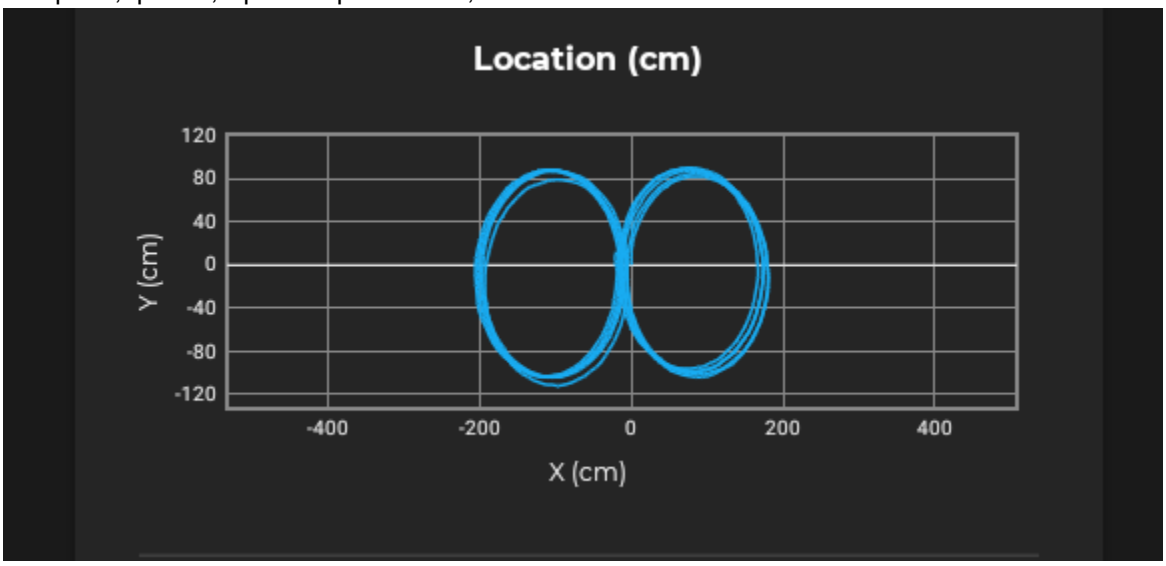


5.3 Software

Sphero block code, Sphero application, Github website

5.4 Hardware

Computer, Iphone, Sphero Spark Robot, Bluetooth

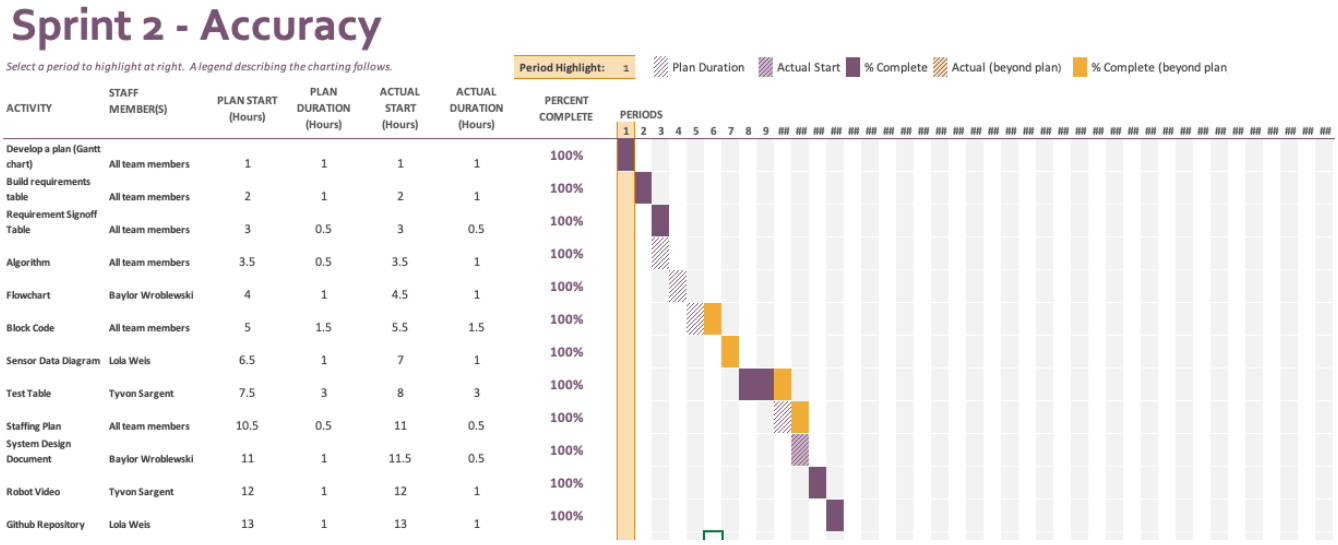


5.5 Test Plan

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	11/9	to follow figure 8 first circle	did not follow	Ty	fail
align aim	11/9	to follow figure 8 first circle	did not follow	lola	fail
align aim	11/9	to follow figure 8 first circle	followed first circle tape	baylor	pass
speed	11/9	slow down to get a more accurate output	went to slow around circle	lola	fail
speed	11/9	slow down to get a more accurate output	was at a perfect speed	ty	pass
get around the circle and land in the midde	11/9	to go around the circle and land where it started	went off the tape	baylor	fail
get around the circle and land in the middle	11/9	to go around the circle and land where it started	went too far past the end point	lola	fail
get around the circle and land in the middle	11/9	to go around the circle and land where it started	did the circle and hit the endpoint	ty	pass
loop the entire figure 8 5 times	11/9	to figure 8 5 times	it looped 5 times	baylor	pass
Change colors	11/9	For the robot to light up multi-color for 5 seconds	the robot did light up for the multi color for 5 seconds	lola	pass
get the robot to speak “i am the winner”	11/9	robot to speak at the end of the figure 8	robot did speak at the end of the figure 8	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
Lola Weis	Planner, Organizer	Gantt chart, Github owner	Tyvon
Tyvon Ali Sargent	Tester	Videographer, Test planner	Baylor