

Sprint 2 - Accuracy Design Document
November 21, 2023

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1. Executive Summary

1.1 Project Overview

This project is split into 3 parts- accuracy being the second. Our robot must successfully run the figure eight course 5 times. A path will be laid out on the floor. Our robot must stay within the path provided. Your robot will start and finish in the square provided. Upon finishing, our robot will speak 'I am the winner' and flash multicolored lights for 5 seconds.

1.2 Purpose and Scope of this Specification

This document addresses requirements related to phase 1 of our CS final:

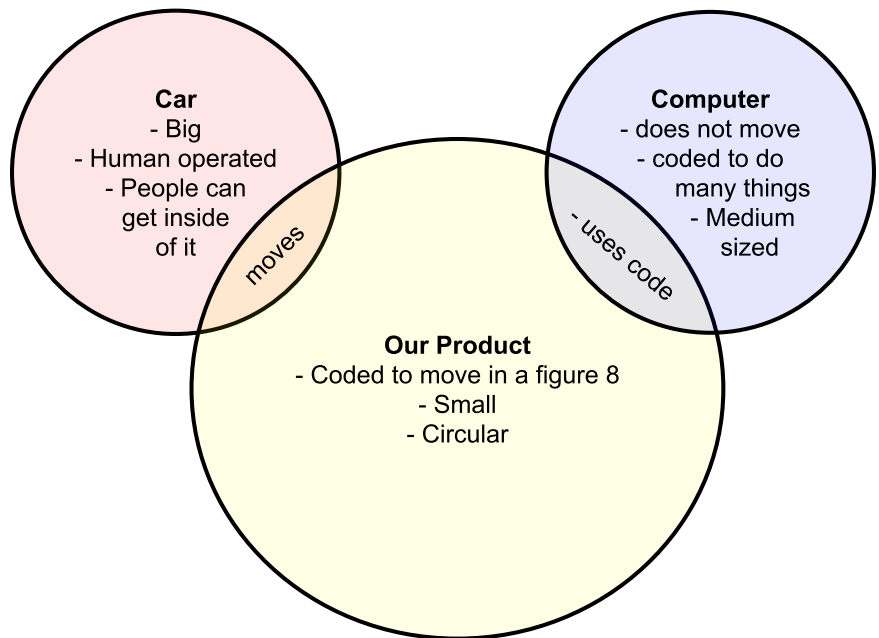
- Accuracy
- Repetition

2. Product/Service Description

This project requires our robot to travel in a figure 8 five times. Some possible factors that may affect or challenge us in the completion of this project are how the robot glides after we code it to stop moving, how to maneuver the angles, speed, and timing of the block code, any dirt or obstacles in the way that may knock our robot off its path, and the trial and error in getting our robot to trace the tape on the floor exactly.

2.1 Product Context

This product relates to automobiles in the way that they both move, though they are different because our product is coded and small, and cars are user operated and large. This product relates to a computer in the way that they both use code to operate, though they are different because our product is coded to move, and computers are coded for a multitude of reasons, but they are not able to move.



2.2 User Characteristics

1. Student
 - a. in a computer science class
 - b. has a computer
2. Teacher
 - a. teaching the computer science class
 - b. has a computer

2.3 Assumptions

In order to use this product, you would need to have a Sphero SPRK+ robot, a computer or phone that can run Sphero EDU, and access to room HH208. That can be checked on the MyMU.

2.4 Constraints

This design may not work if you do not have...

- the current version of Sphero EDU downloaded on your device
- access to room HH208
- a Sphero SPRK+ robot

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- a clear path
- a correct orientation of your robot
- a working computer with a lot of disc space

I actually noticed that the figure 8 provided is not a perfect figure 8, so it was pretty difficult to get it to stay on the path we needed using the code we created.

2.5 Dependencies

This product will need...

- the current version of Sphero EDU downloaded on your device
- access to room HH208
- a Sphero SPRK+ robot
- a clear path
- a correct orientation of your robot
- a working computer with a lot of disc space

3. Requirements

- Start from the center of the figure 8
- go in a circle towards the right, meeting back at the center of the figure 8
- go in a circle towards the left, meeting back at the center of the figure 8
- repeat 5 times
- speak 'I am the winner' and flash multicolored lights for 5 seconds

3.1 Functional Requirements

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
ENDUR_01	Start from the center of the figure 8	Easy	1	11/21	11/21
ENDUR_02	Go in a circle towards the right, meeting back at the center of the figure 8	Difficult	1	11/21	11/21
ENDUR_03	Go in a circle towards the left, meeting back at the center of the figure 8	Difficult	1	11/21	11/21
ENDUR_04	Repeat 5 times	Easy	1	11/21	11/21
ENDUR_05	Speak 'I am the winner' and flash multicolored lights for 5 seconds	Easy	1	11/21	11/21

3.2 Security

3.2.1 Protection

The computer used should have a password in order to keep the code secured. The robot should be in possession of the students at all times so it does not get lost or stolen.

3.2.2 Authorization and Authentication

The computer will have to be logged on by one of the students/team members.

3.3 Portability

All of the parts are relatively portable. The computer can be a laptop which you can carry around, and the robot is small enough to fit in a backpack. You just can't take room HH208 with you.

4. Requirements Confirmation/Stakeholder sign-off

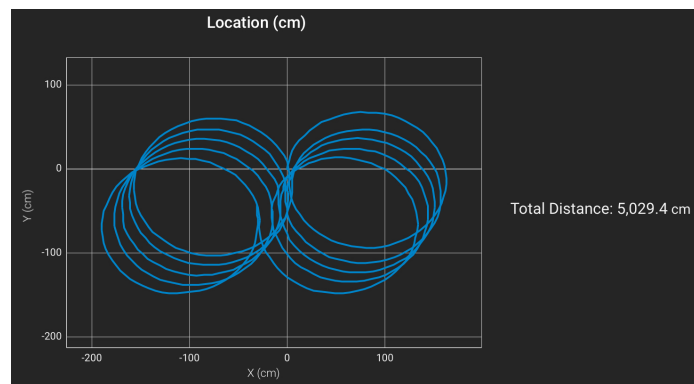
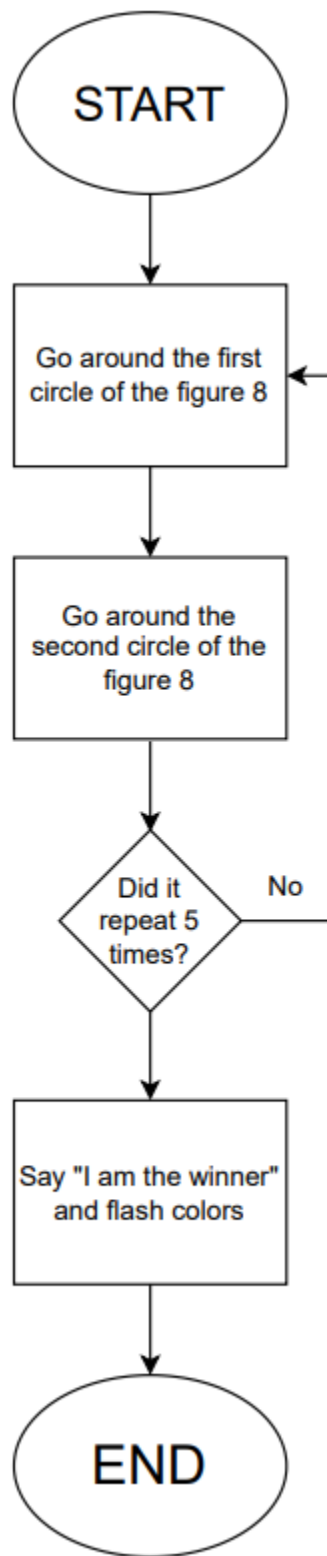
Meeting Date	Attendees (name and role)	Comments
11/19/2023	Lynda, Kevin, Chris	third meeting outside of class (sprint 2)

5. System Design

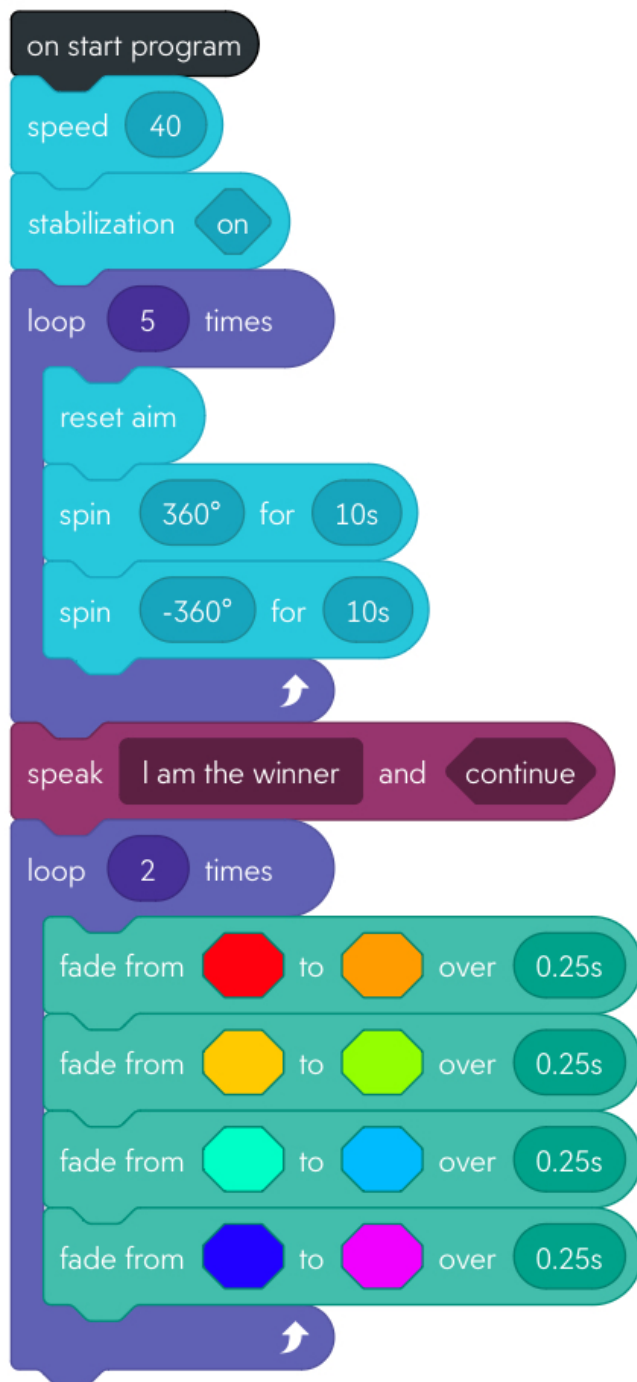
5.1 Algorithm

- Start from the center of the figure 8
- go in a circle towards the right, meeting back at the center of the figure 8
- go in a circle towards the left, meeting back at the center of the figure 8
- repeat 5 times
- speak 'I am the winner' and flash multicolored lights for 5 seconds

5.2 System Flow



5.3 Software

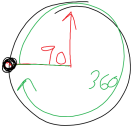



5.4 Hardware

- a Sphero SPRK+ robot
- a working computer with a lot of disc space

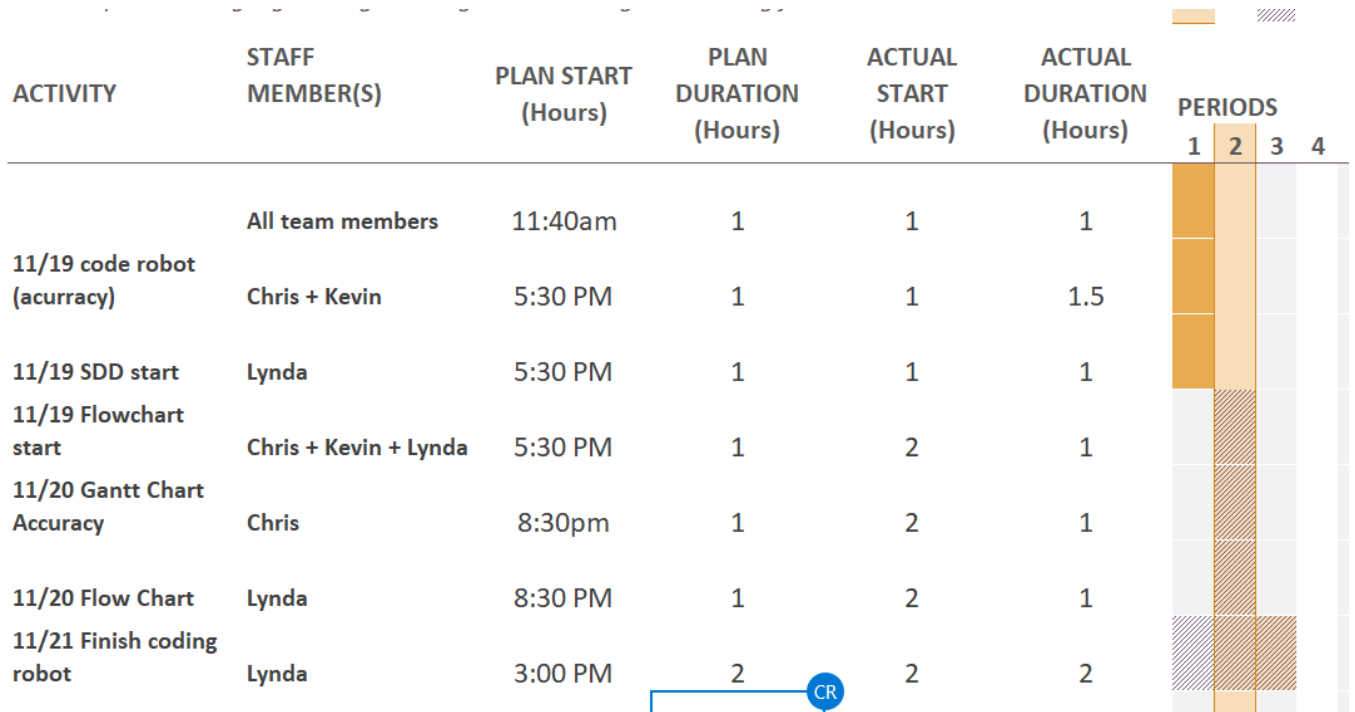
5.5 Test Plan

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Reason for Test Case	Test Date	Expected Output	Observed Output	Staff Name	Pass/Fail
figuring out how circle works- degrees	11/19	it will make a full circle	we need 360 degrees in order for it to go in a full circle 	Lynda, Kevin, Chris	Fail
figuring out how circle works- degrees	11/19	it will make a full circle	went in a full circle, but the aim was off 	Lynda, Kevin, Chris	Fail
figuring out how circle works- motor	11/19	it will make a full circle	wobbled around a lot	Lynda, Kevin, Chris	Fail
figuring out how circle works- degrees	11/19	it will make a full circle	went in a full circle, aim was STILL not good	Lynda, Kevin, Chris	Fail
get colors right	11/22	it will flash rainbow	it flashed rainbow	Lynda	Pass
figuring out how circle works- degrees	11/22	it will make a full circle	went in a full circle, aim good	Lynda	Pass
final test	11/22	it will fulfill all requirements	fulfilled all requirements	Lynda	Pass

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5.6 Task List/Gantt Chart



5.6 Staffing Plan

Name	Role	Responsibility	Reports To
Chris	Tester	Troubleshooting	Lynda
Lynda	Center of data	Puts work into data tables (data entry)	Kevin
Kevin	Manager	Make sure everything is on task	Chris