Sprint 1 - Endurance Design Document

November 8, 2023

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1. Executive Summary

1.1 Project Overview

This project is split into 3 parts- Endurance being the first. We have to have our robot successfully navigate the perimeter of Room HH208. When the program starts, it has to turn green, say, “Ready, Set, Go!” and move in a rectangle around the room. Once it is finished, the light has to turn green and speak, “I’m done, I need water”.

1.2 Purpose and Scope of this Specification

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

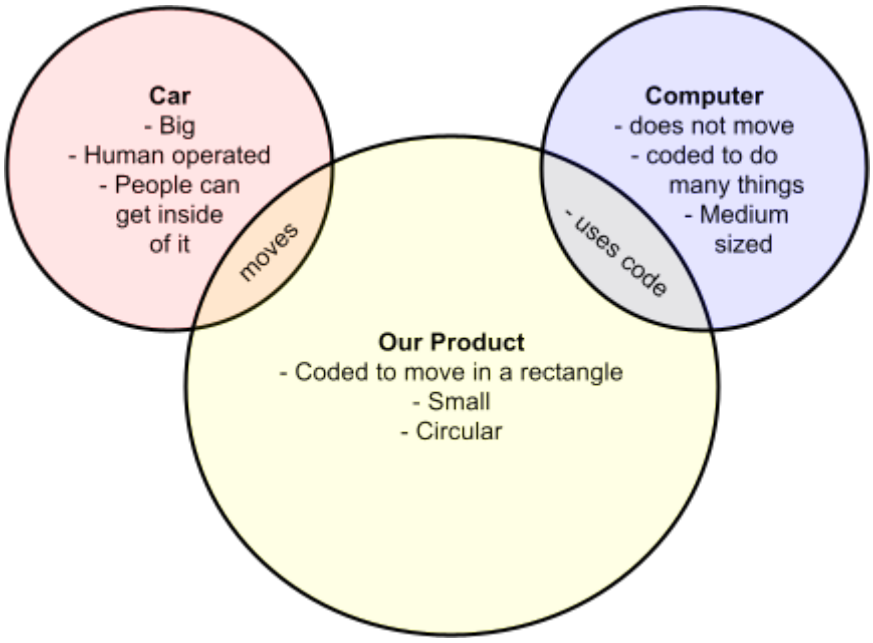
- Endurance
- Repetition

2. Product/Service Description

This project requires our robot to travel in a rectangle. 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, any dirt or obstacles in the way that may knock our robot ff 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
- a clear path

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

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 yellow square with blue tape
- Start with a green light and say ‘Ready set go’
- Stay on the track of the tape on the floor
- Get to first right angle
- Turn right
- Cannot hit anything in its way
- Return to its starting location
- Stop with a red light and say ‘I’m done and I need water’.

3.1 Functional Requirements

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
ENDUR_01	Start from the yellow square with blue tape	Easy	1	11/6	11/6
ENDUR_02	Start with a green light and say ‘Ready set go’	Easy	1	11/6	11/6
ENDUR_03	Stay on the track of the tape on the floor	Difficult	1	11/6	11/6
ENDUR_04	Turn right 3 times	Easy	1	11/6	11/6
ENDUR_05	Cannot hit anything in its way	Easy	1	11/6	11/6
ENDUR_06	Return to its starting location	Kind of difficult	1	11/6	11/6
ENDUR_07	Stop with a red light and say ‘I’m done and I need water’	Easy	1	11/6	11/6

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 fir in a backpack. You just can't take room HH208 with you.

4. Requirements Confirmation/Stakeholder sign-off

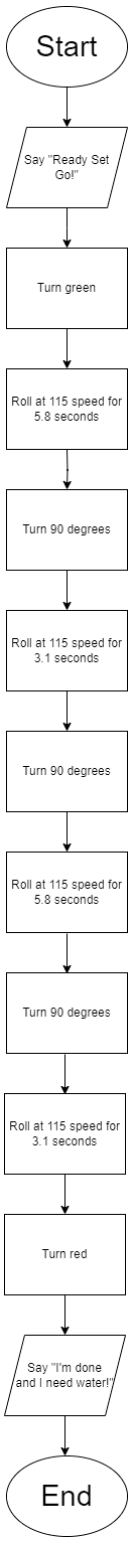
Meeting Date	Attendees (name and role)	Comments
10/30/2023	Lynda, Kevin, Chris	first meeting outside of class (sprint 1)
11/6/2023	Lynda, Kevin, Chris	second meeting outside of class (sprint 1)

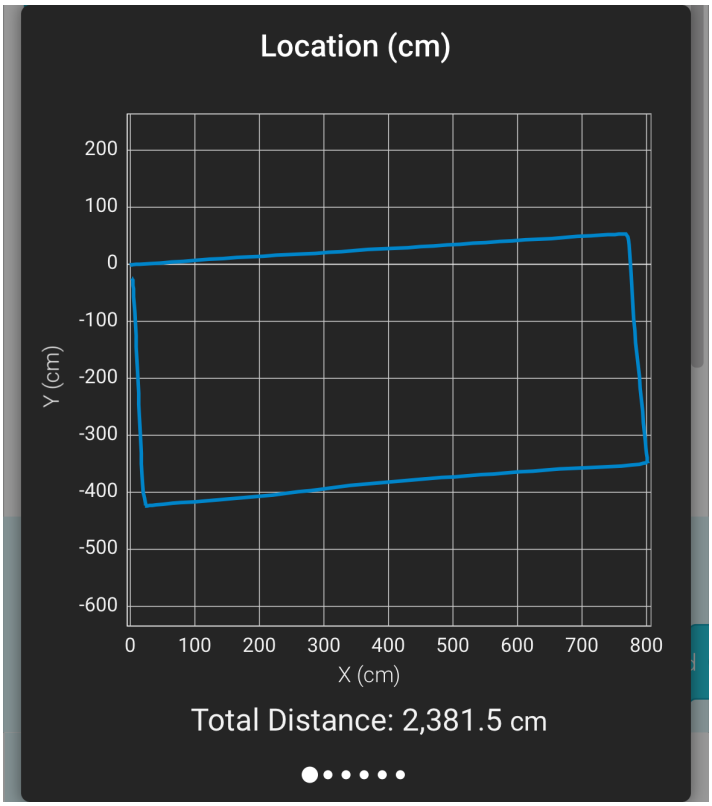
5. System Design

5.1 Algorithm

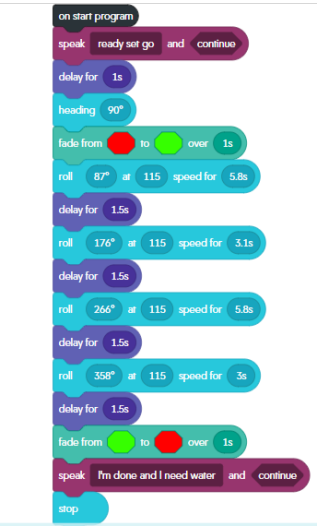
- Start from the yellow square with blue tape
- Start with a green light and say 'Ready set go'
- Stay on the track of the tape on the floor
- Turn right 3 times
- Return to its starting location
- Stop with a red light and say 'I'm done and I need water'.

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

Reason for Test Case	Test Date	Expected Output	Observed Output	Staff Name	Pass/Fail
first turn	10/27	go to the corner	too far		

5.6 Task List/Gantt Chart

ACTIVITY	STAFF MEMBER(S)	PLAN START (Hours)	PLAN DURATION (Hours)	ACTUAL START (Hours)	ACTUAL DURATION (Hours)
Class 10/23	**All team members**	11:40am	1	1	1
10/30 code robot (endurance)	**Chris + Kevin**	8:30pm	1	1	1
10/30 SDD start	**Lynda**	8:30pm	1	1	1
11/6 code robot (endurance)	**Chris + Kevin**	8:30pm	1	2	1
11/6 Gantt Chart for Endurance	**Kevin**	8:30pm	1	2	1
11/6 Flowchart (Endurance)	**Lynda**	9:00 PM	1	2	1
11/6 SDD cont. (Endurance)	**Chris + Lynda**	9:30 PM	2	2	1

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