Sprint 2 - Accuray Design Document

April 19, 2021

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1. Executive Summary

1.1 Project Overview

The overview of this project is the second sprint to the triathlon. The second sprint is called accuracy.

1.2 Purpose and Scope of this Specification

The purpose of this sprint is for the robot to be able to follow the figure-8 course five times. The robot must be able to do is accurately and then say ‘I am the winner’ and then flash multicolor for five seconds

2. Product/Service Description

The robot is a sphere and us being used to get around a figure eight course. In the second sprint the robot has to be able to go in the shape and then speak and flash.

2.1 Product Context

This product is related to other products because it is a robot and can be managed by different types of coding. For this specific project we are using block code. This robot would be self-contained because everything needed to control it is in the app. The app is what connects it to be able to control it through bluetooth.

2.2 User Characteristics

- Student/faculty/staff/other: students can learn how to use block code, teachers can gain experience by using it to teach.
- experience: gives one experience on computing, especially block code.
- technical expertise
- other general characteristics that may influence the product

2.3 Assumptions

I assume that this sprint will probably be one of the harder sprints. We have not really worked with a circle motion shape, just straight pathways. By going to the classroom it is easier to see the specific path size and be able to test our code out.

2.4 Constraints

- parallel operation with an old system
- audit functions (audit trail, log files, etc.)
- access, management and security
- criticality of the application
- system resource constraints (e.g., limits on disk space or other hardware limitations)
- other design constraints (e.g., design or other standards, such as programming language or framework)

2.5 Dependencies

- This new product will require a daily download of data from sphero app
- Endurance needs to be completed before we can start the final sprint 3
- figuring out time to get to the classroom and test out robot
- figuring out the code used for a figure 8

3. Requirements

3.1 Functional Requirements

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
ENDUR_01	robot will begin	in middle of course	1	4/8	same
ENDUR_02	the robot will begin to make the figure eight shape	robot will stay in accurate course	1	4/8	same
ENDUR_03	robot will be able to do this precisely and accurate five times	done five times and stay on lines	1	4/8	same
ENDUR_04	robot will stop after the fifth figure eight	robot will begin where it started	1	4/8	same
ENDUR_05	robot will say ‘I am the winner’	stay in spot	1	4/8	same
ENDUR_06	robot will light up multi colors for five seconds	stay in spot	1	4/8	same

3.2 Security

3.2.1 Protection

- encryption: practicing the code and algorithms to encrypt it
- activity logging, historical data sets: keeping track of work
- restrictions on intermodule communications
- data integrity checks

3.2.2 Authorization and Authentication

I did not use any authorization or authentication apps because i didn't feel we needed it for this project since it was simple.

3.3 Portability

- Percentage of components with host-dependent code; 15%
- Percentage of code that is host dependent; 85%
- Use of a proven portable language; yes
- Use of a particular compiler or language subset; yes
- Use of a particular operating system; yes
- The need for environment-independence - the product must operate the same regardless of operating systems, networks, development or production environments.

4. Requirements Confirmation/Stakeholder sign-off

Meeting Date	Attendees (name and role)	Comments
4/9/21	Adrianna and Dylan	meet in robotics classroom

5. System Design

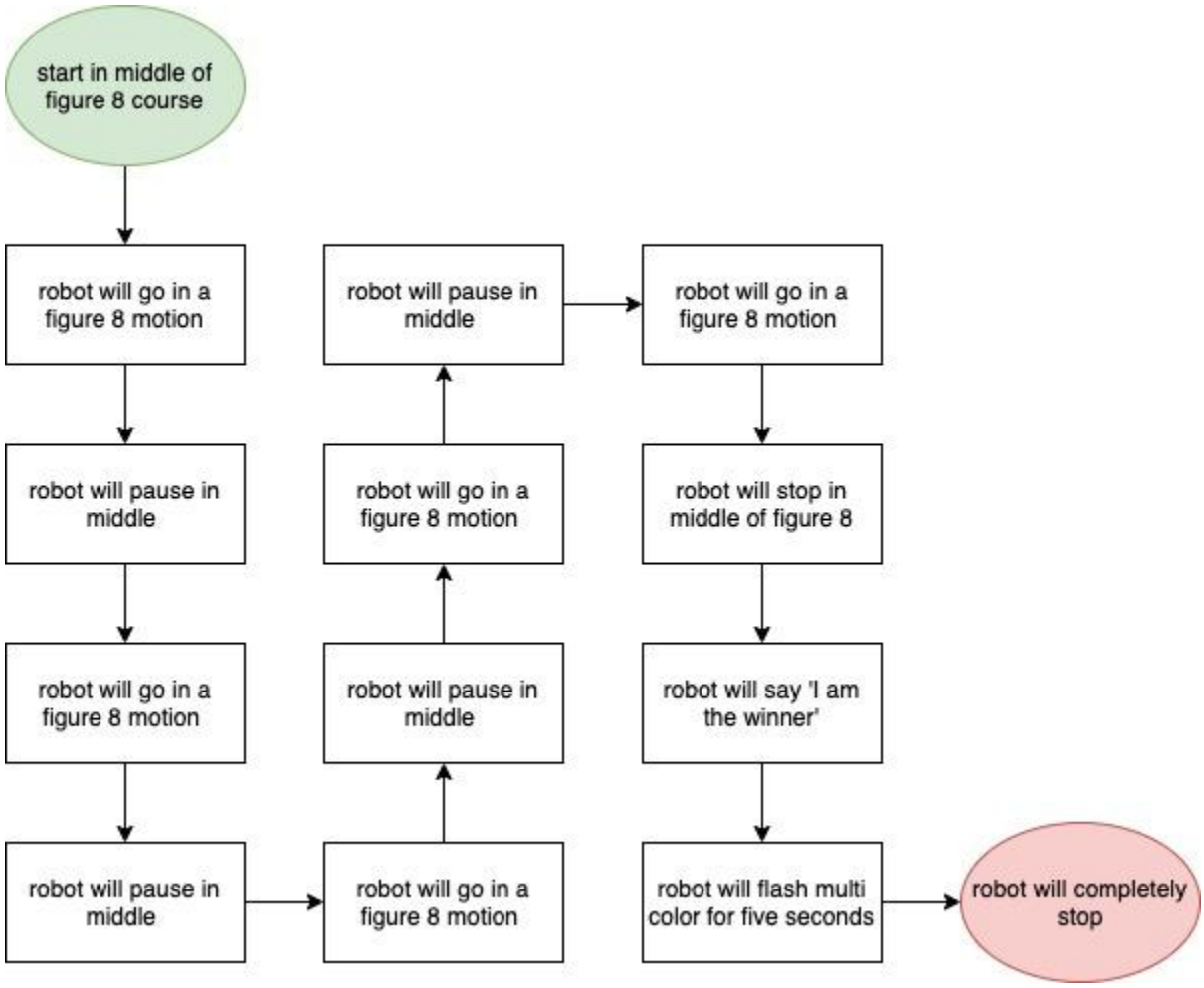
This section will provide all details concerning the technical design, staffing, coding, and testing the system

5.1 Algorithm

Develop and describe here the algorithm that will be used to provide the required performance of your software

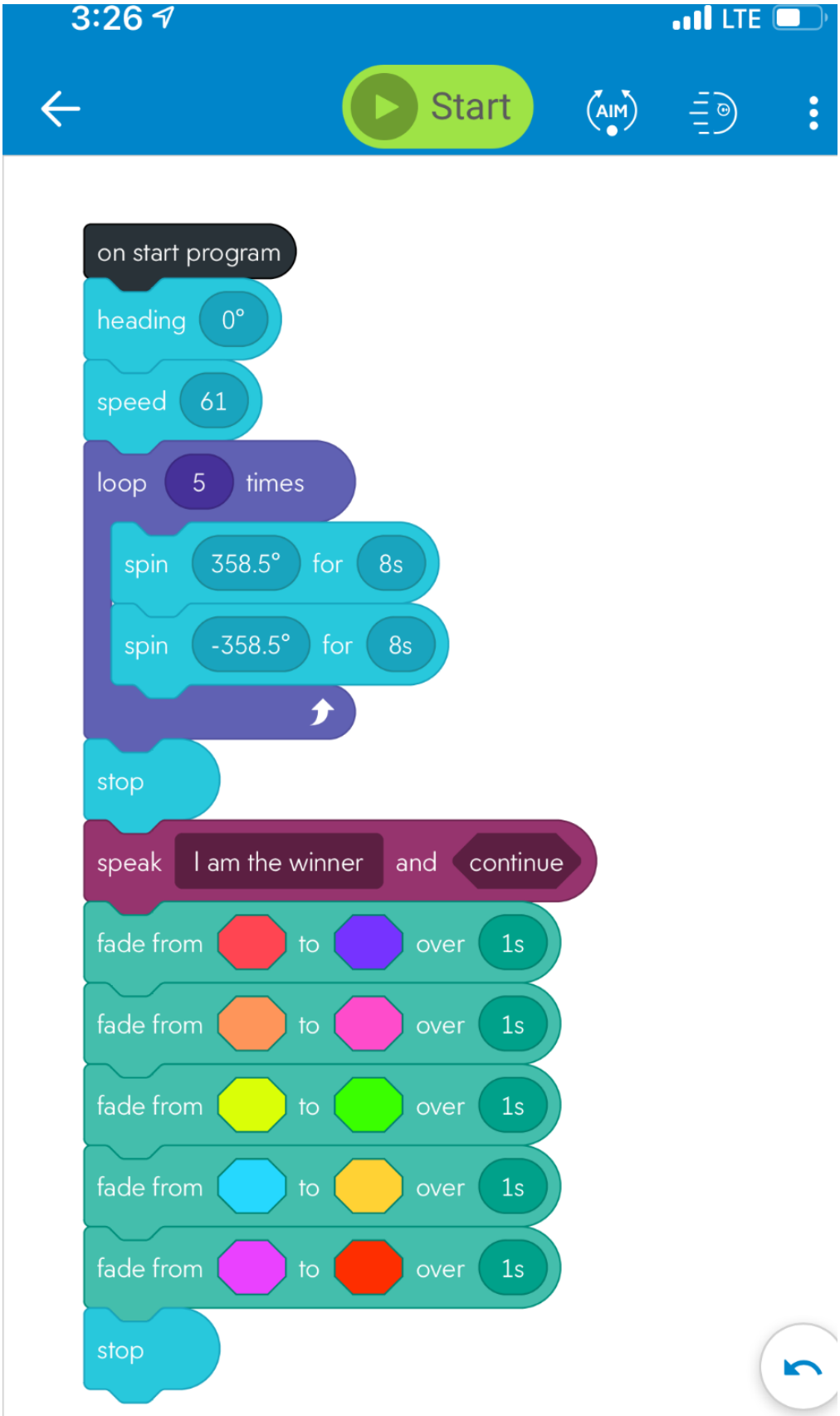
- robot will start at starting point in middle of course
- robot will do a figure 8
- robot will repeat the figure 8 four more times
- robot will stop at the point where it started
- robot will say 'I am the winner'
- robot will flash multi colors for five seconds

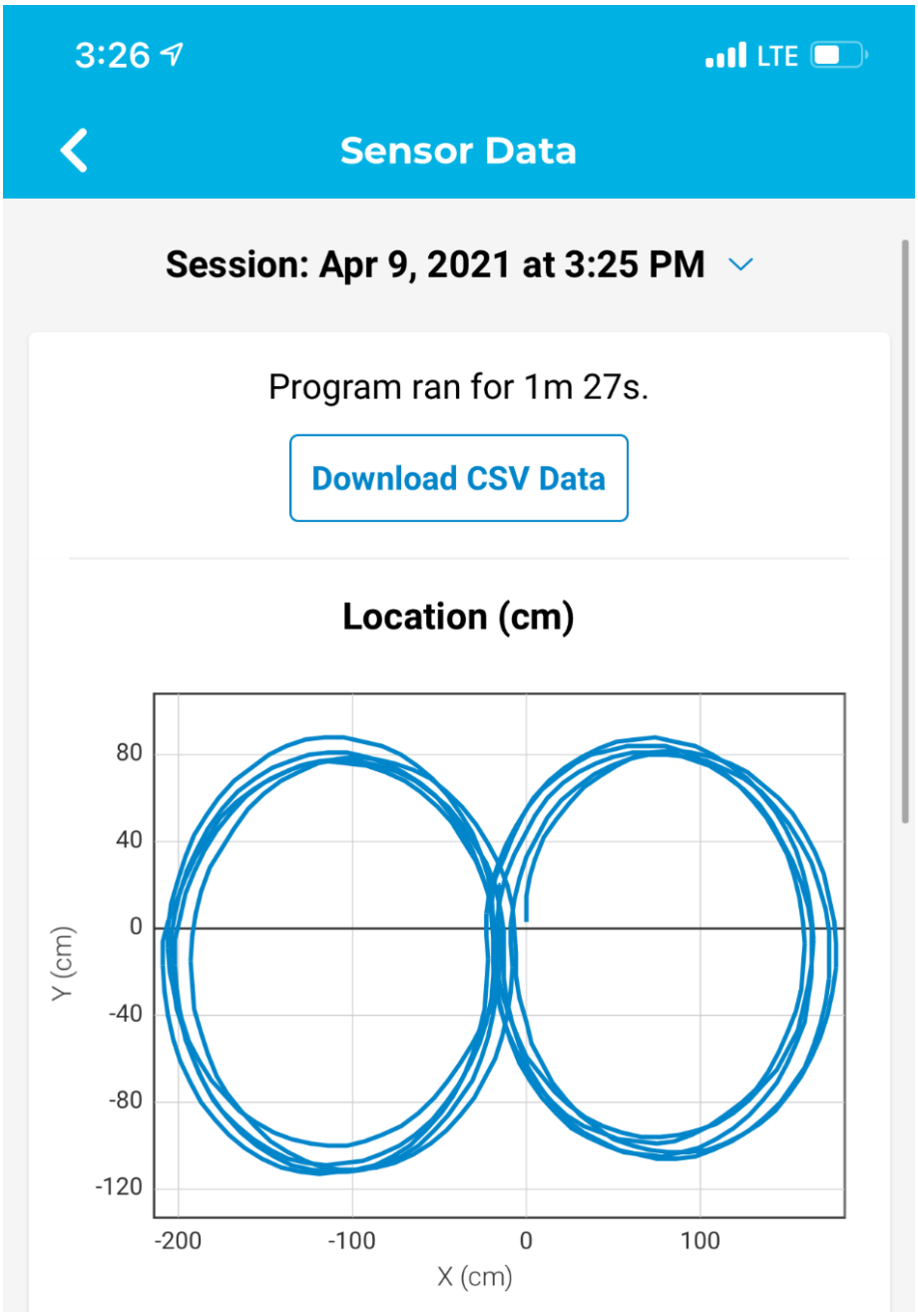
5.2 System Flow



5.3 Software

sphero, google docs, google sheets, github


3:26
LTE
Start
AIM
on start program
heading 0°
speed 61
loop 5 times
spin 358.5° for 8s
spin -358.5° for 8s
stop
speak I am the winner and continue
fade from to over 1s
fade from to over 1s
fade from to over 1s
fade from to over 1s
fade from to over 1s
stop



5.4 Hardware

- sphero robot
- sphero app
- adrianna-mac laptop

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
Create Code	4/9	Figure out how to make figure 8	Struggled to figure out how to do it	Dylan & Adrianna	F

Create Code	4/9	Figured out how to make the figure 8 work	Sphero went in a figure 8. Adjustments needed.	Dylan & Adrianna	P
Test Code	4/9	Change the speed and rotation of the robot	Sphero was on and all we needed was the lights to flash at the end.	Dylan & Adrianna	P
Create code for the flashing lights	4/9	Add blocks of code to flash multicolored lights for 5 seconds	Lights at the end flashed for 5 seconds after saying “I’m the winner”	Dylan & Adrianna	P
Small adjustments to code to make the pathing correct	4/9	Needed more adjustments to make sure the robot went on the path and finished where it started	Sphero stayed on the path and finished where it started.	Dylan & Adrianna	P
Take screenshots of pathing and block code	4/9	Took screenshots of the block code	Screenshots were uploaded system design document and github	Adrianna	P

5.6 Task List/Gantt Chart

[Sprint 2 Accuracy Gantt project plan - Google Sheets]

t 2 - Accuracy

Select a period to highlight at right. A legend describing the charting follows. | Period Highlight:

ACTIVITY	STAFF MEMBER(S)	PLAN START (Hours)	PLAN DURATION (Hours)	ACTUAL START (Hours)	ACTUAL DURATION (Hours)	PERCENT COMPLETE	PERIODS 1	2	3
Develop a plan (Gantt chart)	All team members	1	2	1	1	0%			
Build requirements table	Adrianna	1	1	20 min	20 min	100%			
develop an algorithm	adrianna	6	30 min	20 min	20 min	100%			
block code	adrianna and dylan	1	1	1	1	100%			
flowchart	adrianna	1	20 min	30 min	30 min	100%			
test table	dylan	1	1	1	1	100%			
staffing plan	all team member	5 min	5 min	10 min	10 min	100%			
system design document	all team member	1	1	1	1	100%			
robot video	dylan	2	1	30 min	30 min	100%			

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
adrianna	member	requirement table, algorithm, flow chart	all members
dylan	member	recording, test table	all members

adriannalanfranco/Accuracy (github.com)