

Sprint 2- Accuracy Design Document

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1. Executive Summary

1.1

1.2 *Project Overview*

This project is showing our ability to problem solve, quantify, organize, document, code, test, and present a software system. For this project we will be working with our group overcoming an endurance based challenge relating to software engineering. We will be using a robot to show that we accomplished the task at hand. The intended audience for this project is the Professor and the rest of the students taking CS-101.

1.3 *Purpose and Scope of this Specification*

In Scope

This document addresses requirements related to Sprint 1 of the Robotics Project.

- modification of code to travel in a square to meet requirements
- modification of performance optimization for this sprint
- rule based classification

Out of Scope

The following items in Sprint 2 and Sprint 3 of the Robotics Project are out of scope.

- modification of code to travel around obstacle course
- modification of code to travel in a figure eight

2. Product/Service Description

2.1 *Product Context*

This product relates to other products in the fact that they are controllable robots. The difference between his product and others is that instead the robot can only perform in certain paths that are programmed into the robot. It is an independent product. It does not interact with a variety of related systems.

2.2 *User Characteristics*

- Student and staff will use this product
- Need coding experience
- Must have access to a computer or phone
- Technical expertise

2.3 *Assumptions*

- Assumed user has access to sphereo +, if not available must change requirement
- Assume user has access to Sphero Edu, if not can't complete the project
- Assumed that user has access to test room, can't complete tests if not available
- If user does not know how to access app, then requirements would have to change

2.4 *Constraints*

- Old software being used to run the code
- Different software being used to run the code
- Robot is damaged
- Device that has code doesn't have bluetooth

- Language is not Sphero Edu block code

2.5 Dependencies

- Code must be done on Mac or iPhone
- Robot must be fully charged
- Code must be up to date
- Robot synced with bluetooth to the coding device.

3. Requirements

3.1 Functional Requirements

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
ACCUR_01	Robot must complete the figure 8 5 times	Required for full credit	1	11/18	Approved
ACCUR_02	Robot must start and stop in provided square	Required for full credit	1	11/18	Approved
ACCUR_04	Robot must not stray from the blue tape	Required for full credit	1	11/18	Approved
ACCUR_05	When finished robot will say 'i am the winner' and flash multicolored lights for 5 seconds	Required for full credit	1	11/18	Approved
ACCUR_06	Speed of robot is to be determined	Will depend on how stable the floor is.	2	11/18	Approved

3.2 Security

3.2.1 Protection

- encryption
- password login
- private server
- constant server checks
- logging user activity

3.2.2 Authorization and Authentication

Only members of the group making the code and the professor will be able to see the code. This will make sure that the code isn't changed by a random person. It will be accessed through a link provided by one person.

3.3 Portability

- The robot is host dependent
- The device that is writing code must have Sphero Edu
- The environment must be flat and smooth that the robot is used in
- Their needs to be a good network connection

4. Requirements Confirmation/Stakeholder sign-off

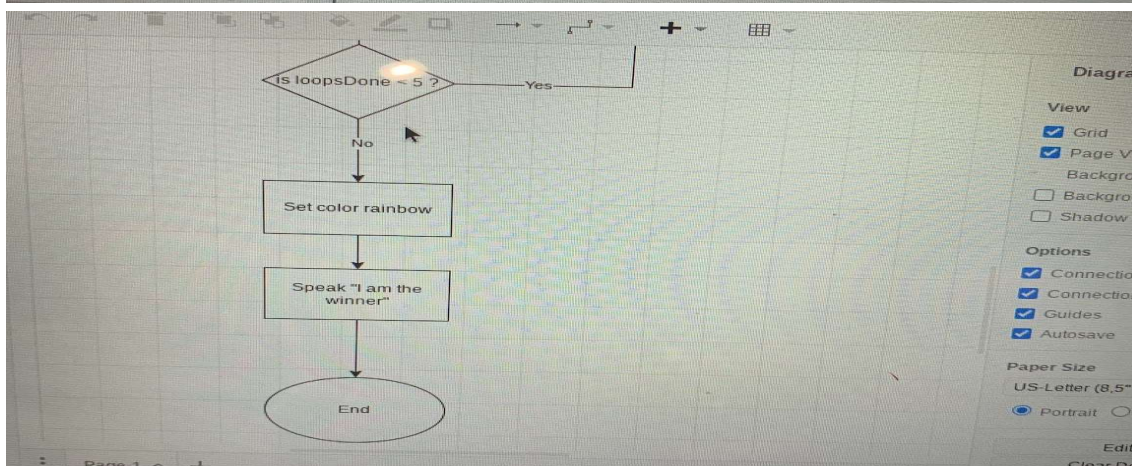
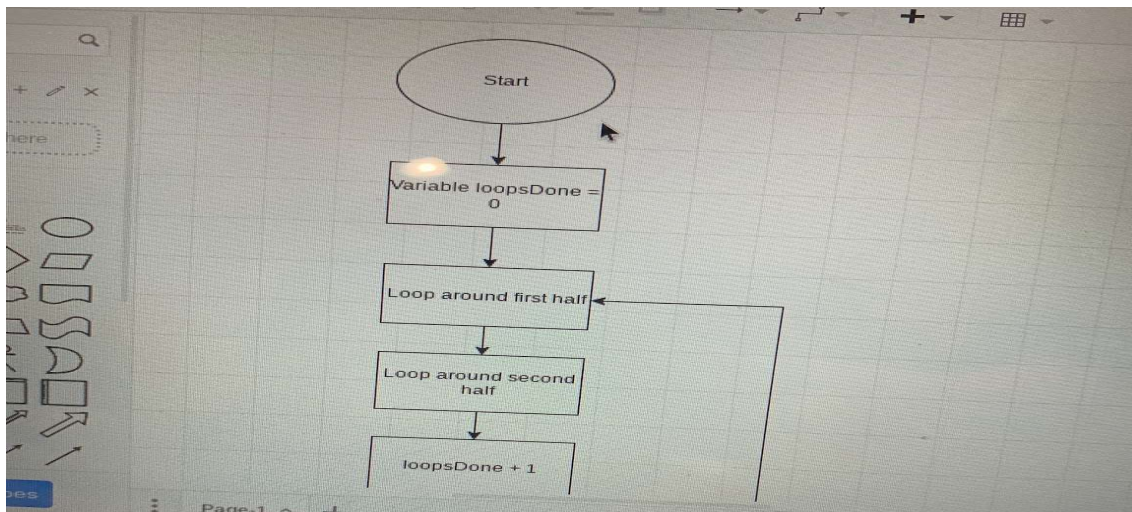
Meeting Date	Attendees (name and role)	Comments
11/18	Conor(Recorder), Ziv(Problem Solver), Lucas(Coder)	Confirmed all of the Requirements

5. System Design

5.1 Algorithm

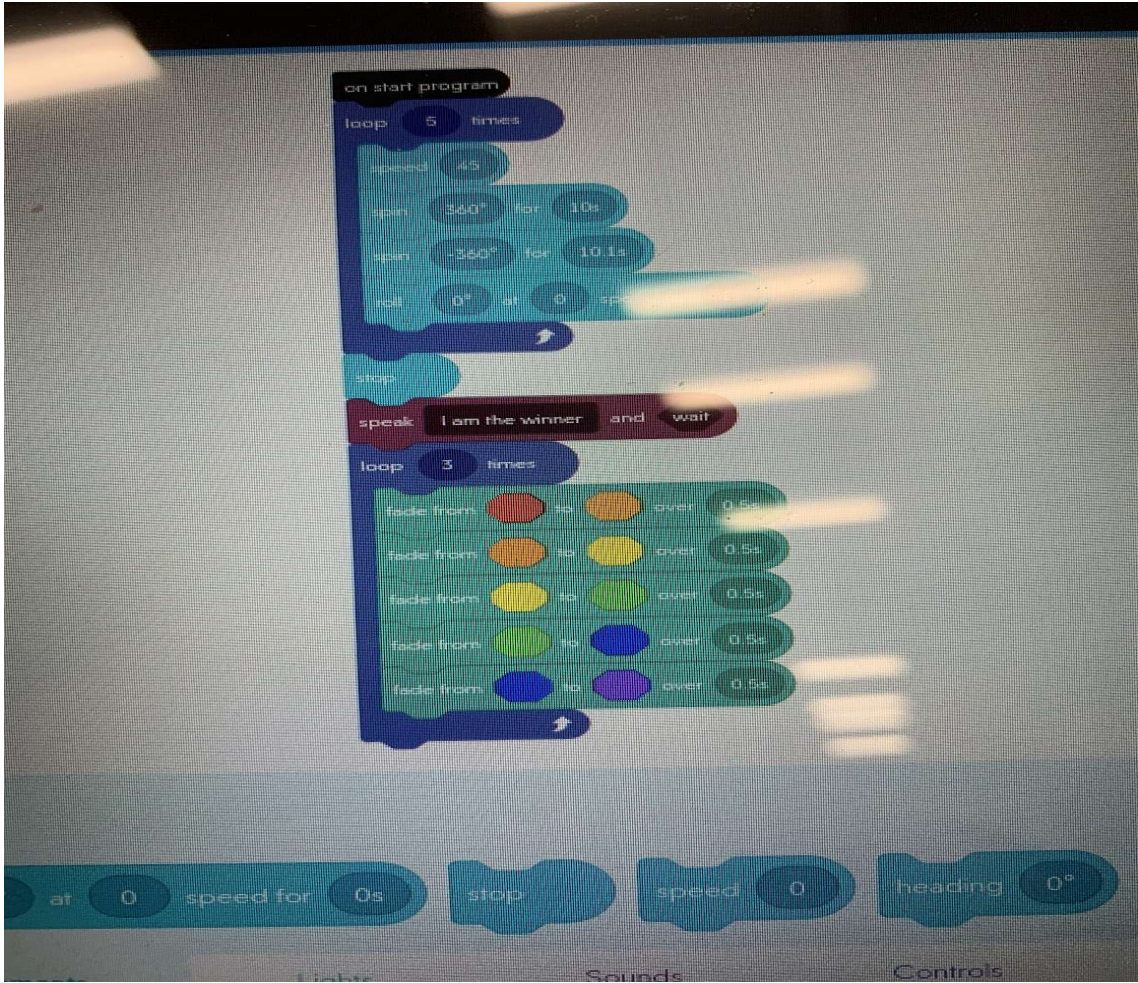
1. Place the robot on the provided square
2. Set the robot to travel figure 8
3. Repeat (2) 5 times
4. Set the robot to say "i am the winner" when done
5. Set the robot to flash multicolored lights for 5 seconds when done

5.2 System Flow



5.3 Software

The software program that was used was Spehro Edu. The language that was used was block code. Block code is a visual and easy approach to programming that uses puzzle-like pieces that link together to form code. It is very easy and user accessible for beginners.



5.4 Hardware

Hardware that was used for this Sprint was a computer. We used the computer to download the programing application Sphero Edu. The computer was used to develop the application. We used the Spark Plus robot to test our application. To demonstrate our application we used a phone to record a video that will be uploaded online.

5.5 Test Plan

Reason for Test Case	Test Date	Expected Output	Observed Output	Staff Name	Pass/Fail
Test if the robot can make it around the first circle on the path.	11/18	Robot makes it around first circle on path	Robot went in to narrow of a circle	Conor	Fail

Reason for Test Case	Test Date	Expected Output	Observed Output	Staff Name	Pass/Fail
Test if the robot can make it around the first circle on the path.	11/18	Robot makes it around first circle on path	Robot went in to wide of a circle	Conor	Fail
Test if the robot can make it around the first circle on the path.	11/18	Robot makes it around first circle on path	Robot made it around the first circle on the path	Conor	Pass
Test if the robot can make it around the first and second circle one time on path	11/18	Robot makes it around the first and second circle on the path.	Made it through the first circle on the path and then the second circle was a little narrow.	Conor	Fail
Test if the robot can make it around the first and second circle one time on path	11/18	Robot makes it around the first and second circle on the path.	Made it through the first circle on the path and then made it through the second circle on the path.	Conor	Pass
Test if the robot can make it around the first and second circle 5 times on path	11/18	Robot makes it around the first and second circle once accurately then slowly starts to deviate from path		Conor	Fail
Test if the robot can make it around the first and second circle 5 times on path	11/18	Robot makes it around first and second circle five times with no deviation from path	Robot made it around first and second circle five times with no deviation from path	Conor	Pass
Test if the robot can make it around the first and second circle 5 times on path and speak "I am the winner"	11/18	Robot makes it around first and second circle five times with no deviation from path and says "I am the winner"	Robot made it around first and second circle five times with no deviation from path and said "I am the winner"	Conor	Pass
Test if the robot can make it around the first and second circle 5 times on path and speak "I am the winner" and flashes multicolored lights for 5 seconds	11/18	Robot makes it around first and second circle five times with no deviation from path and says "I am the winner" and flashes multicolored lights for 5 seconds	Robot made it around first and second circle five times with no deviation from path and said "I am the winner" and flashed multicolored lights for 5 seconds	Conor	Pass

5.6 Task List/Gantt Chart

ACTIVITY	STAFF MEMBER(S)	PLAN START (Hours)	PLAN DURATION (Hours)	ACTUAL START (Hours)	ACTUAL DURATION (Hours)	PERCENT COMPLETE
Develop a plan (Gantt chart)	All team members	1	2	1	1	100%
Build requirements table	Conor	3	2	2	2	100%
Algorithm	Ziv	3	1	2	1	100%
FlowChart	Lucas	4	2	3	2	100%
Block code	Lucas	4	2	3	2	100%
Sensor data diagram	Lucas	6	1	6	1	100%
Test table	Conor	6	1	6	1	100%
Staffing Plan	All team member	1	1	1	1	100%
System Design Document	Conor	1	10	1	4	100%
Robot video	Ziv	6	1	6	1	100%
Github Repository	Lucas	8	1	7	1	100%
Review SSD	Ziv	9	1	9	2	100%
Submit Sprint	Lucas	10	1	10	1	100%

5.7 Staffing Plan

Name	Role	Responsibility	Reports To
Ziv	Problem Solver	write the algorithm and film the robot, checks over SSD	Conor
Conor	Recorder	Record info and fill out the SSD	Lucas
Lucas	Coder	Write the flowchart and the code	Ziv+Conor