# Sprint 2 – Accuracy Design Document

## April 14, 2022

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# 1. Executive Summary

## *1.1 Project Overview*

Our robot should successfully travel around the rectangular course in room HH208. This is the accuracy course.

## *1.2 Purpose and Scope of this Specification*

**In scope**

- Responsibilities
- Meet times

**Out of Scope**

The following items in phase 3 of Project A are out of scope:

- Exact code needed to complete track
- Length of time needed to complete track

# 2. Product/Service Description

- Robot must be charged enough to complete the course.
- Need a Bluetooth device to control the robot.

## *2.1 Product Context*

How does this product relate to other products? Is it independent and self-contained? Does it interface with a variety of related systems? Describe these relationships or use a diagram to show the major components of the larger system, interconnections, and external interfaces.

## *2.2 User Characteristics*

- Justin- Novice Python experience, never used Shepro robot prior, no experience using block code or javascript
- Briana – Never used Sphero Robot prior, no experience using block code or javascript
- Jason - Never used Sphero Robot prior, no experience using block code or javascript

## *2.3 Assumptions*

- Equipment availability, if robot isn't available, we wouldn't be able to test our code and see if our robot moved correct.
- Need an electronic device to connect to robot to start it and make it move.
- If robot isn't charged, we won't be able to use it.
- To make the robot move we need to have our code finished.

## *2.4 Constraints*

Describe any items that will constrain the design options, including

- Sphero may or may not have issues connecting to certain devices.
- Sphero may or may not roll correctly while on its path.
- Access to sphero is limited, there is only one sphero for three people.
- Sphero application may react/work differently depending on OS
- Limited knowledge of JavaScript
- Time constraints of physical meetings

## *2.5 Dependencies*

List dependencies that affect the requirements. Examples:

- The robot must bre connected to a device via Bluetooth in order to function
- Said deice must be on and not have other devices connected to it.
- The robot will require to be charged before running the course.
- This robot needs a block code in order to run the course correctly.

# 3. Requirements

- Robot must follow course in the room.
- Robot must run the figure eight course 5 times.
- Robot will start in finish in the square provided.
  Must stay within the path provided.

## *3.1 Functional Requirements*

| Req# | Requirement | Comments | Date Rvwd |
|---|---|---|---|
| ACC01 | Figure out plan | Completed the set-up | 1/1 |
| ACC02 | Attempt to make robot go in circle | Almost completed a full circle (fail) | 1/5 |
| ACC03 | Attempt to make robot go in circle | Robot was able to complete circle | 1/6 |
| ACC04 | Figure out a figure 8 pattern | Gained an understanding of how to create a figure 8 pattern | 1/8 |
| ACC05 | Find proper loop | Loop was created | 1/10 |
| ACC01 | Test/record loop | Loop was succesful | 1/11 |

## *3.2 Security*

### 3.2.1 Protection

- Sphero account is under 1 password.
- Meetings and dates the program is accessed are recorded

### 3.2.2 Authorization and Authentication

1 password keeps data in a guarded virtual vault

## *3.3 Portability*

The sphero.edu website/app has an open option to be shared with others, as well as a private option, connecting the robot to a device is simple, all it requires is a stable bluetooth connection, and how the robot moves/speaks/lights up is not affected by the OS differences.

# 4. Requirements Confirmation/Stakeholder sign-off

| Meeting Date | Attendees (name and role) | Comments |
|---|---|---|
| 1/1 | All | Completed a set-up for future |

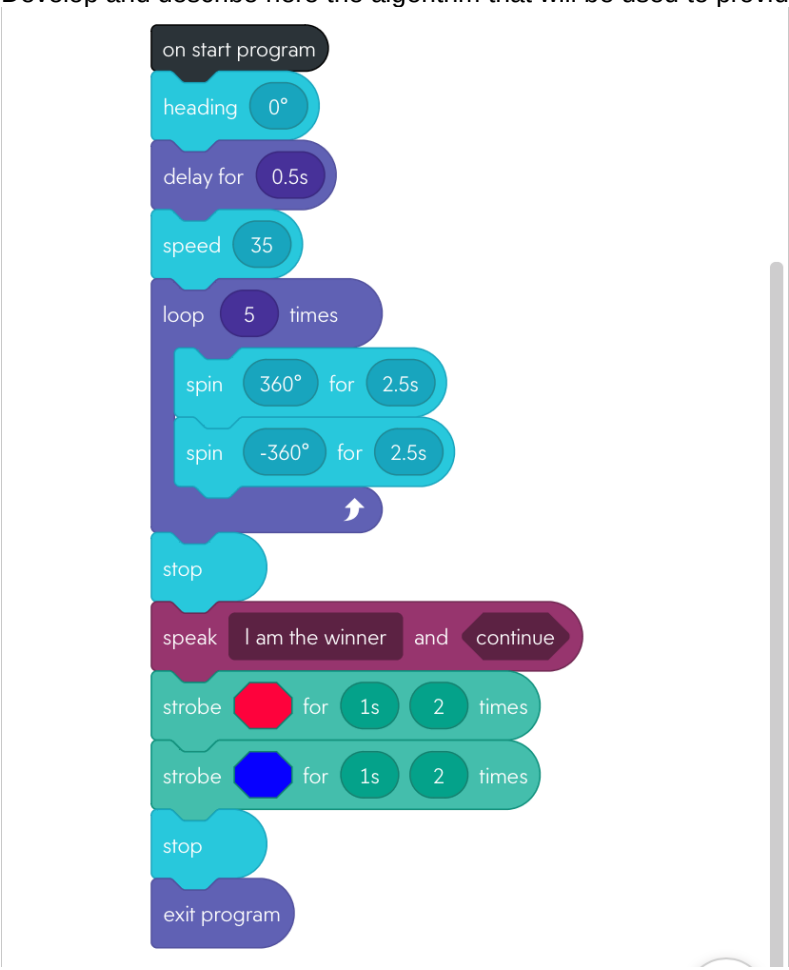
| | | |
|---|---|---|
| 1/6 | Briana, Jason | Tested a full circle with robot |
| 1/11 | Justin, Briana | Completed robot path and video |

# 5. System Design

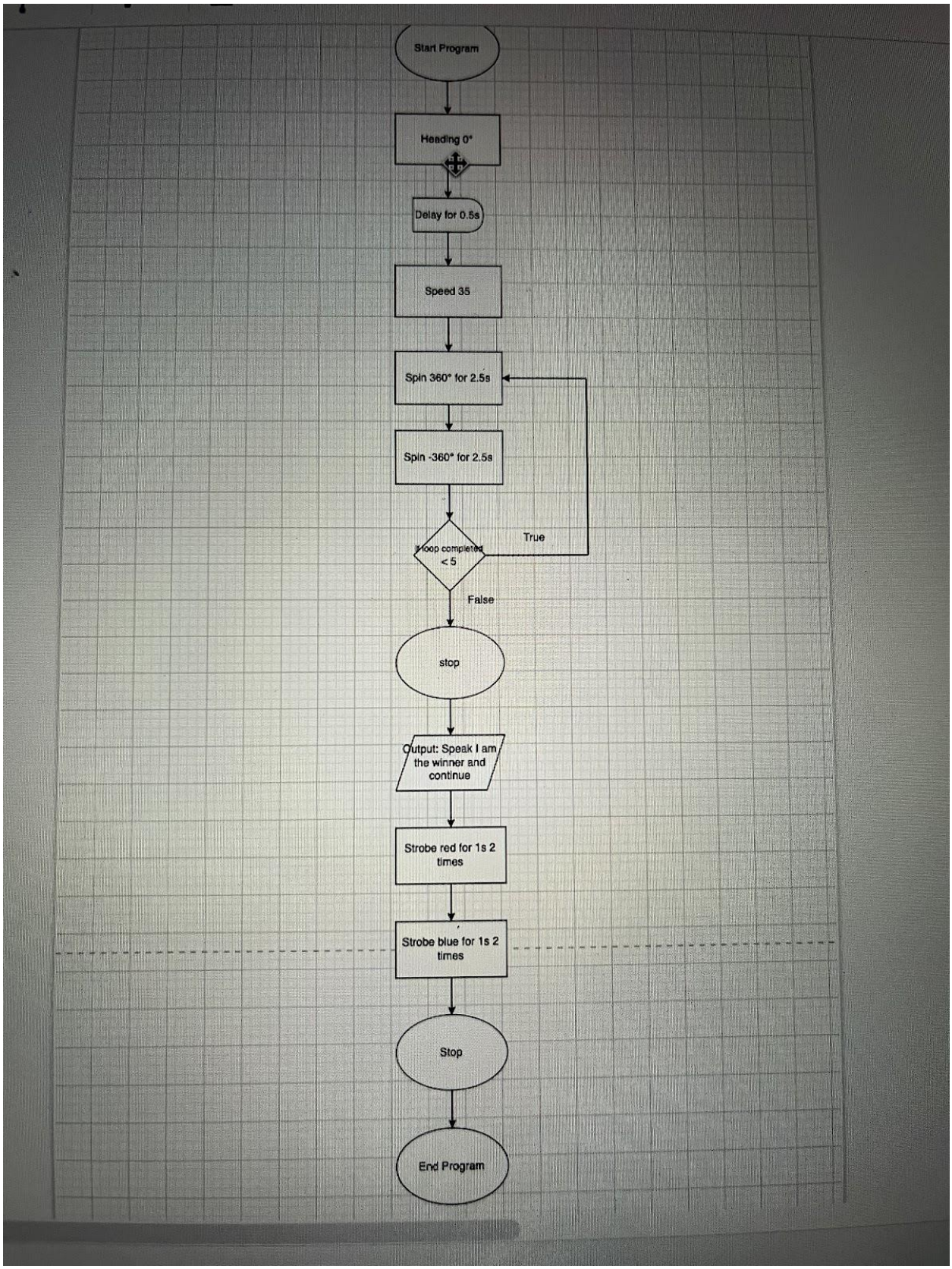
- We created an algorithm and made a flow chart.
- Then did the block code for the robot to move around the course.

## *5.1 Algorithm*

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



## *5.2 System Flow*




## *5.3 Software*

The sphero application follows block code/javascript.

## 5.4 Hardware

Cell phones and laptops were used to create/ put together the block/ javascript code.

## 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 |
|---|---|---|---|---|---|
| Understand the robots ability to go in circular motion | 1/5 | Code robot for a circular pattern | Unable to complete | Justin | Pass |
| Make robot go in circle | 1/6 | Robot will do a complete circle | Robot was able to complete circle | All | Pass |
| Figure 8 pattern | 1/8 | Complete figure 8 loop | | Jason | Pattern |
| Complete figure 8 | 1/10 | Record and watch figure 8 pattern | Robot could not complete figure 8 pattern | Jason, Briana | Fail |
| Complete figure 8 | | Record and watch figure 8 pattern | Successfully completed figure 8 | Justin Briana | Pass |

## 5.6 Task List/Gantt Chart

| | A | B | C | D | E | F | G |
|---|---|---|---|---|---|---|---|
| 1 | | TAFF MEMBER(S) | | | | | |
| 2 | ACTIVITY | | AN START (Hours | N DURATION (Hou | UAL START (Hou | AL DURATION (Ho | ERCENT COMPLE |
| 3 | Develop a plan | Justin | 1 | 1 | 1 | 1 | 100% |
| 4 | Build requirem | Briana | 1 | 1 | 1 | 1 | 100% |
| 5 | Algorithim | Briana | 1 | 2 | 1 | 1 | 100% |
| 6 | FlowChart | Jason | 3 | 1 | 2 | 1 | 100% |
| 7 | Block Code | Justin | 4 | 4 | 3 | 5 | 100% |
| 8 | Sensor Data Di | Justin | 8 | 2 | 8 | 1 | 100% |
| 9 | Test Table | Briana | 10 | 1 | 6 | 1 | 100% |
| 10 | Staffing Plan | Justin | 10 | 1 | 6 | 1 | 100% |
| 11 | SDD | Briana | 11 | 1 | 7 | 1 | 100% |
| 12 | Robot Video | Jason | 12 | 1 | 8 | 2 | 100% |
| 13 | Github Repos | Jason | 13 | 1 | 9 | 1 | 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 |
|---|---|---|---|
| Justin | Project Manager | Manage roles, meet times | All |
| Briana | Document Recorder | Documentation corrections<br>SDD completion | All |
| Jason | Visual | Create workspace(github)<br>Robot Video, Flowcharts | All |