Sprint 2 - Speed Design Document

November 11th, 2019

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# Executive Summary

## Project Overview

The second sprint titled Speed is a project to see if a Sphero SPRK+ robot can be coded to follow a figure eight path at least 5 times without going off the track once. We will test to see how fast it can go and if it can go around the figure eight without going off course.

## Purpose and Scope of this Specification

The purpose of this specification is to show people that the Sphero SPRK+ robot is useful and can follow tracks if coded the right way. The robot is fairly new technology and will be tested around multiple courses specifically for this one the figure eight course.

# Product/Service Description

## Product Context

## This product is very similar to any kind of robot that can be coded with block coding in a software. The code is very different from what we’ve been working with, but it is a lot easier since it is in a simple form. For this specific test the block coding will be coded to follow a figure eight course.

## User Characteristics

## Edward, Frankie, and Vinny all have the same amount of experience with the code and robot since we are all studying the same thing in the same class.

## Assumptions

The assumptions for this test are that we will be able to sign out a robot, code, and test the code without any time constraints or problems.

## Constraints

The constraints for this project is that if the code is not working properly, the robot is not working properly, or there are no robots available to be signed out to do any coding before the deadline is reached.

## Dependencies

The only dependency for this project is the code because if the code does not work than the whole project will have if multiple and multiple code tests fail as well.

# Requirements

## Functional Requirements

| Req# | Requirement | Comments | Priority | Date Rvwd | SME Reviewed / Approved |
| --- | --- | --- | --- | --- | --- |
| ENDUR\_01 | Travel on the figure eight at least 5 times. | The robot must travel on the figure eight at least 5 times in order for the project to be successful. | Robot traveling around figure eight. | 11/10/19 | Approved |
| ENDUR\_02 | Stay on course of the figure eight. | If the robot does not stay on course while traveling around the figure eight than the test will fail. | Robot staying on course of the figure eight. | 11/10/19 | Approved |
| ENDUR\_03 | When traveled around at least 5 times say, “I’m the winner!” | If the robot does not say, “I’m the winner!” than we will not know if it went around the figure eight at least 5 times. | Robot says, “I’m the winner!” | 11/10/19 | Approved |

## Security

### Protection

The factors that will protect this system is that since Edward is coding and testing the code of the robot he will be responsible of taking care of the robot on and off the course, making sure that nobody touches the robot or accidentally steps on the robot.

### Authorization and Authentication

The Authorization factors of this project is the person in charge of signing out the robots will authorize Edward to code and test the robot by moving it around.

## Portability

There is no portability required for this project.

# Requirements Confirmation/Stakeholder sign-off

|  |  |  |
| --- | --- | --- |
| Meeting Date | Attendees (name and role) | Comments |
| 11/10/19 | Edward Gatling - Code | Edward developed and tested the code until the Robot successfully completed the figure eight. |

# System Design

## Algorithm

The algorithm used for this project is first the robot will travel around the figure eight at least 5 times without going of course. If the robot goes off course than the project will fail and end. If the robot does not go off course than the project will pass and the robot will say, “I’m the winner!”

## System Flow

The flowchart is attached in GitHub.

## Software

The software used to develop this project is Sphero.

## Hardware

The hardware used to develop this project is the Sphero SPRK+ robot.

## Test Plan

| **Reason for Test Case** | **Test Date** | **Expected Output** | **Observed Output** | **Staff Name** | **Pass/Fail** |
| --- | --- | --- | --- | --- | --- |
| Robot program | Nov 11 | To run smoothly in figure 8 | Jagged turns and off course | Edward Gatling | Fail |
| Robot program | Nov 11 | To run smoothly in figure 8 | On course but turns are still jagged | Edward Gatling | Fail |
| Robot program | Nov 11 | To run smoothly in figure 8 | On course and turns are smooth | Edward Gatling | Pass |

## Task List/Gantt Chart

The Gantt Chart is attached in GitHub.

## Staffing Plan

| Name | Role | Responsibility | Reports To |
| --- | --- | --- | --- |
| Edward Gatling | Algorithm | Work with robot and create algorithm | Github |
| Edward Gatling | Test plan | List and describe test results | Github |
| Edward Gatling | Code | Develop the code and test the code | Github |
| Vincent Fossetta & Frankie Gleeson | Requirements & Documentation | Document the requirements and other necessities | Github |
| Frankie Gleeson | Flow Chart | Display the algorithm through a flow chart | Github |