Sprint 2 - Accuracy Design Document

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# Executive Summary

## Project Overview

This project is a test for three developers to see all the steps in coding and developing a new program. The intended audience for this project is students and staff of Monmouth University.

## Purpose and Scope of this Specification

The purpose of this specification for its intended audience is to see the limits of how far this robot can be pushed.

In scope

This document addresses requirements related to phase 1 of Project Robot:

* modification of speech to meet legislative mandate ENDUR\_02.
* modification of circular movement to meet legislative mandate ENDUR\_3.

Out of Scope

The following items in phase 2 of Project Robot are out of scope:

* modification of speed to meet legislative mandate ENDUR\_4.

# Product/Service Description

Some factors that could affect this product could include a water spill, a crack in the ground, bumps. The project also needs the Sphero Edu app to run.

## Product Context

This product relates to other products independently. It interfaces with a variety of different smart phones. The product interfaces with phones created by Samsung and Apple.

## User Characteristics

* Student-low level experience/low-level technical expertise
* Faculty- mid level experience/mid-level technical expertise
* Staff-high level experience/maximum level technical expertise
* Other-no experience/no technical expertise

## Assumptions

As long as a person has a phone and can press the start button, they can run the program if given the code. No prior experience or technical expertise is required because the program can run on its own.

## Constraints

* Robot can only be controlled from a certain distance
* Only block code can be used
* Only phones can control the robot

## Dependencies

* This new product will require the Sphero Edu app to be downloaded
* Bluetooth will be needed
* A stable Wi-Fi connection will be needed

# Requirements

## Functional Requirements

| Req# | Requirement | Comments | Priority | Date Rvwd | SME Reviewed / Approved |
| --- | --- | --- | --- | --- | --- |
| ENDUR\_01 | Robot lights up different colors for 5 seconds on completion | Also needs to speak | 1 | 11/17 | Bryn |
| ENDUR\_02 | Robot speaks on completion | “I am the winner” | 1 | 11/17 | Bryn |
| ENDUR\_03 | Robot makes it around the course | The robot makes it around the course 5 times and returns to the middle | 1 | 11/17 | Bryn |
| ENDUR\_04 | Robot has good timing | Make the robot complete the course faster | 3 | 11/17 | Bryn |
| ENDUR\_05 | Robot will get around bumps | Change block code to fit the course | 2 | 11/17 | Bryn |

## 

## Security

### Protection

* Finger encryption
* Facial recognition
* Pattern lock
* Number lock

### Authorization and Authentication

No authorization was required because all activities were handled in person.

## Portability

* Percentage of components with host-dependent code: 50%
* Percentage of code that is host dependent: 100%
* proven portable language: none
* compiler or language subset: block code
* operating system: iOS/android
* environment-independence: full independence

# Requirements Confirmation/Stakeholder sign-off

|  |  |  |
| --- | --- | --- |
| Meeting Date | Attendees (name and role) | Comments |
| 11/04/21 | Bryn, Taye, Adnan | confirmed all except ENDUR\_05 and ENDUR\_06 |
| 11/08/21 | Bryn, Taye, Adnan | Confirmed ENDUR\_05 and ENDUR\_06 |

# System Design

## Algorithm

* Start
* Circle left
* Circle right
* Circle left
* Circle right
* Circle left
* Circle right
* Circle left
* Circle right
* Circle left
* Circle right
* Stop
* Say “I am the winner”
* Flash multicolored lights for 5 seconds

## System Flow

Diagram

Description automatically generated

## Software

The software language used to develop and deploy this application was block code. This form of code divides and stacks different parts of the task at hand. Block coding is a beginner level of code because pieces of code are given to you and the only thing you must do is connect the pieces of the puzzle.

## Hardware

The hardware platforms that were used to develop, test, and demonstrate this application included an iPhone a Samsung Galaxy, and the robot itself. Each phone was used to develop the block code that ran the robot. The robot was used to test and demonstrate this application.

## Test Plan

| **Reason for Test Case** | **Test Date** | **Expected Output** | **Observed Output** | **Staff Name** | **Pass/Fail** |
| --- | --- | --- | --- | --- | --- |
| Pathfinding 1 | 11/17 | Robot makes it around the first circle | Robot made it around the first circle | Bryn, Taye, Adnan | Pass |
| Pathfinding 2 | 11/17 | Robot makes it around the second circle | Robot made it around the second circle | Bryn, Taye, Adnan | Pass |
| Pathfinding 3 | 11/17 | Robot makes it around the first circle again | Robot made it around the first circle again | Bryn, Taye, Adnan | Pass |
| Pathfinding 4 | 11/17 | Robot makes it around the second circle | Robot made it around the second circle | Bryn, Taye, Adnan | Pass |
| Pathfinding 5 | 11/17 | Robot repeats pathfinding 1 and 2 three more times | Robot repeated pathfinding 1 and 2 three more times | Bryn, Taye, Adnan | Pass |
| Speech | 11/17 | Robot says “I am the winner” | Robot said “I am the winner” | Bryn, Taye, Adnan | Pass |
| Lights | 11/17 | Robot flashes different colors for 5 seconds | Robot flashed different colors for 5 seconds | Bryn, Taye, Adnan | Pass |

## Task List/Gantt Chart

Chart, bar chart

Description automatically generated

## Staffing Plan

| Name | Role | Responsibility | Reports To |
| --- | --- | --- | --- |
| Bryn | Project Manager | Oversee and plan development/create system design document | N/A |
| Taye | Developer | Create Gantt chart/algorithm/flow chart | Bryn |
| Adnan | Developer | Develop block code/upload censor data | Bryn |

## Sensor Data Program

Chart, bubble chart

Description automatically generated

## Block Code

Graphical user interface, application

Description automatically generated