**Sprint 2 - Accuracy Design Document**

**November 24, 2020**

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# Executive Summary

## Project Overview

“Your robot must successfully run the figure eight course 5 times. A path will be laid

out on the floor. Your robot must stay within the path provided. Your robot will start and finish

in the square provided. Upon finishing, robot will speak ‘I am the winner’ and flash multicolored

lights for 5 seconds. Points will be deducted if your robot strays from the path, or if it does not go around 5 times, or if it does not finish in the same place it started.”

## Purpose and Scope of this Specification

This specification is meant to document Sprint 2 - Accuracy. The intended audience is Professor Eckert and the other students in CS104-03 Intro to Problem Solving.

In scope

This document addresses requirements related to Sprint 2 - Accuracy:

* Gantt Chart
* Requirements Table
* Requirements Sign-Off Table
* Algorithm
* Flowchart
* Block Code
* Sensor Data Diagram
* Test Table
* Staffing Plan
* System Design Document
* Robot Video (committed to GitHub repository)
* GitHub Repository

Out of Scope

The following items are out of scope:

* Everything relating to Sprint 1 – Endurance
* Everything relating to Sprint 3 – Agility

# Product/Service Description

## Product Context

This product is an independent and self-contained project.

## User Characteristics

Users will be Joe Colonna, John Costa, and Nicole Czerepak – students at Monmouth University. They have limited experience and technical expertise. Project will be graded by Professor Eckert. He has many years of experience and much technical knowledge.

## Assumptions

* Sphero EDU will be usable.
* The robot is in the possession of Nicole Czerepak.

## Constraints

* Must use Sphero EDU block code.
* Must test code on the robot.
* The room used for the tests has been scaled down due to lack of space.

## Dependencies

* Sphero EDU
* The robot

# Requirements

## Functional Requirements

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **#** | **Requirement** | **Comments** | **Priority** | **Date Reviewed** | **SME Reviewed/ Approved** |
| E1 | Must successfully run the figure-eight course 5 times in a row. | Must do. We can scale down the course if space is an issue. | 1 | 11/19/20 | We do not have a SME (Systems Management Expert) besides Professor Eckert. |
| E2 | Robot must speak ‘I am the winner’ after completing the course 5 times. | Must do. | 1 | 11/19/20 |  |
| E3 | Robot mush flash multicolored lights for 5 seconds after completing the course 5 times. | Must do. | 1 | 11/19/20 |  |

## Security

### Protection

No protections needed for this school project.

### Authorization and Authentication

No authorization or authentication needed for this school project.

## Portability

Portability is not a requirement for this school project.

# Requirements Confirmation/Stakeholder sign-off

|  |  |  |
| --- | --- | --- |
| **Meeting Date** | **Attendees (name & role)** | **Comments** |
| 11/18/20 | Nicole Czerepak (coder/tester/robot owner)  Joe Colonna (algorithms/tables)  John Costa (GitHub/editor/SDD) | None |

# System Design

## Algorithm

* 1. Move forward while rotating 360**° in a circle motion.**
  2. After a circle is complete, continue moving forward while rotating 360**°** in the opposite direction.
  3. Stop after five full figure-eights have been completed.
  4. Speak “I am the winner.”
  5. Flash multicolored lights for 5 seconds.

## System Flow

A picture containing text

Description automatically generated

## Software

The software used to develop and deploy this application is Sphero EDU. The code will be programmed using its block code program. The robot will be connected to Sphero, and then the code will be executed. Pictured below is the completed block code and sensor data.

Graphical user interface, chart

Description automatically generated

## Hardware

Besides a computer, the only hardware required is the robot that goes along with Sphero EDU.

## Test Plan

[Insert test plan table here]

## Task List/Gantt Chart

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Sprint 2 - Accuracy** |  |  |  |  |
| *Select a period to highlight at right. A legend describing the charting follows.* | | | | **Period Highlight:** |
| **ACTIVITY** | **GROUP**  **MEMBER(S)** | **PLANNING (HOURS)** | **ACTUAL WORK TIME (Hours)** | **PERCENT COMPLETE** |
| **Develop a plan (Gantt chart)** | **All team members** | 1 | 2 | **100%** |
| **Build requirements table** | **Joe C.** | 0 | 1 | **100%** |
| **Requirements sign-off table** | **Joe C.** | 0 | 1 | **100%** |
| **Algorithm** | **Joe C.** | 1 | 1 | **100%** |
| **Flow chart** | **Nicole C.** | 1 | 2 | **100%** |
| **Coding** | **Nicole C.** | 1 | 2 | **100%** |
| **Sensor data diagram** | **Nicole C.** | 1 | 3 | **100%** |
| **Test table/plan** | **Nicole C.** | 1 | 2 | **100%** |
| **Staffing plan** | **Joe C.** | 0 | 1 | **100%** |
| **Record video of robot** | **Nicole C.** | 0 | 1/2 | **100%** |
| **Set up GitHub repository** | **John C.** | 1 | 1 | **100%** |
| **Fill in, format, and edit system design doc** | **John C.** | 2 | 2 | **100%** |

## Staffing Plan

|  |  |  |  |
| --- | --- | --- | --- |
| **Name** | **Role** | **Responsibility** | **Reports To** |
| Joseph Colonna | Algorithm  Tables | Writes the algorithm and most tables | Each other |
| John Costa | GitHub Manager  Editor  System Design Documentation | Manages collaborative GitHub account, edits all materials, writes System Design Document | Each other |
| Nicole Czerepak | Coder  Tester  Robot Owner | Writes block code, owner of the robot, tests code on robot and documents results, records sensor data graph | Each other |