Sprint 2 - Accuracy Design Document

11/16/22

Melissa Abad, Thomas Farrell, and Derek Boyle

1. *User Characteristics*

Student/faculty/staff/other	experience/technical expertise	
Derek Boyle	experience with coding	
Melissa Abad	no experience	
Thomas Farrell	experience with coding and robots	

1.1 Assumptions

Derek and Thomas will have a better idea of how to work the robot.

1.2 Constraints

- Chairs
- Tables
- Floor isn't flat.

1.3 Dependencies

- Code
- Robot being charged
- Clear path

2. Requirements

2.1 Functional Requirements

Req#	Requirement	Comments	Priority	Date Rvwd	SME Reviewed / Approved
Accuracy_01: Make a Figure 8	Your robot must successfully run the figure eight course.			11/16	
Accuracy_02: Repeat figure 8 five times	Your robot must successfully run the figure eight course 5 times			11/16	
Accuracy_03: Speak	your robot must speak "I am the winner"			11/16	
Accuracy_04: Flash Lights	Your robot must flash multicolored lights for 5 seconds			11/16	

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2.2 Portability

Portability is effortless as the robot is very small and you can bring it with you along with a laptop or just use your phone and you are able to make code for it to follow.

3. Requirements Confirmation/Stakeholder sign-off

Include documentation of the approval or confirmation of the requirements here. For example:

Meeting Date	Attendees (name and role)	Comments
11/15/22	Derek and Melissa and Thomas	Worked on Gant chart
11/16/22	Derek, Melissa, and Thomas	Worked with robot

4. System Design

4.1   Algorithm

1. Start
2. Right-handed turn until completion of full circle
3. Left-handed turn until completion of full circle
4. Repeat steps 4-5 four more times until 5 total completions
5. Say "I am the winner"
6. Ball goes multicolored for 5 seconds
7. End

4.2   System Flow
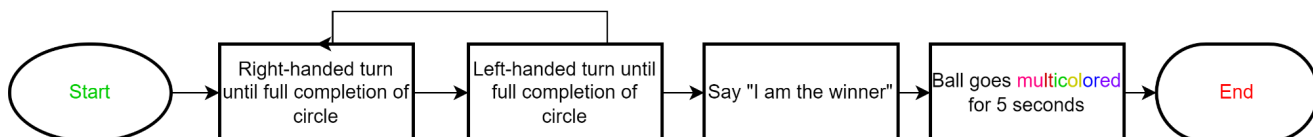
4.3   Software

We used block coding in sphero.edu to create the robot's movement using the coding below.

```
on start program
heading  0°
delay for  0.5s
speed  68
loop  4  times
    spin  360°  for  7.2s
    spin  -360°  for  7s
    ↻
stop
delay for  0.2s
speak  I am the winner  and  wait
main LED  ⬤
delay for  1s
main LED  ⬤
delay for  1s
main LED  ⬤
delay for  1s
main LED  ⬤
delay for  1s
main LED  ⬤
delay for  1s
main LED  ⬤
delay for  1s
exit program
```

4.4   Hardware

For hardware we used the sphere robot and a computer to code along with a phone to record what we did with the robot once we successfully completed the task.
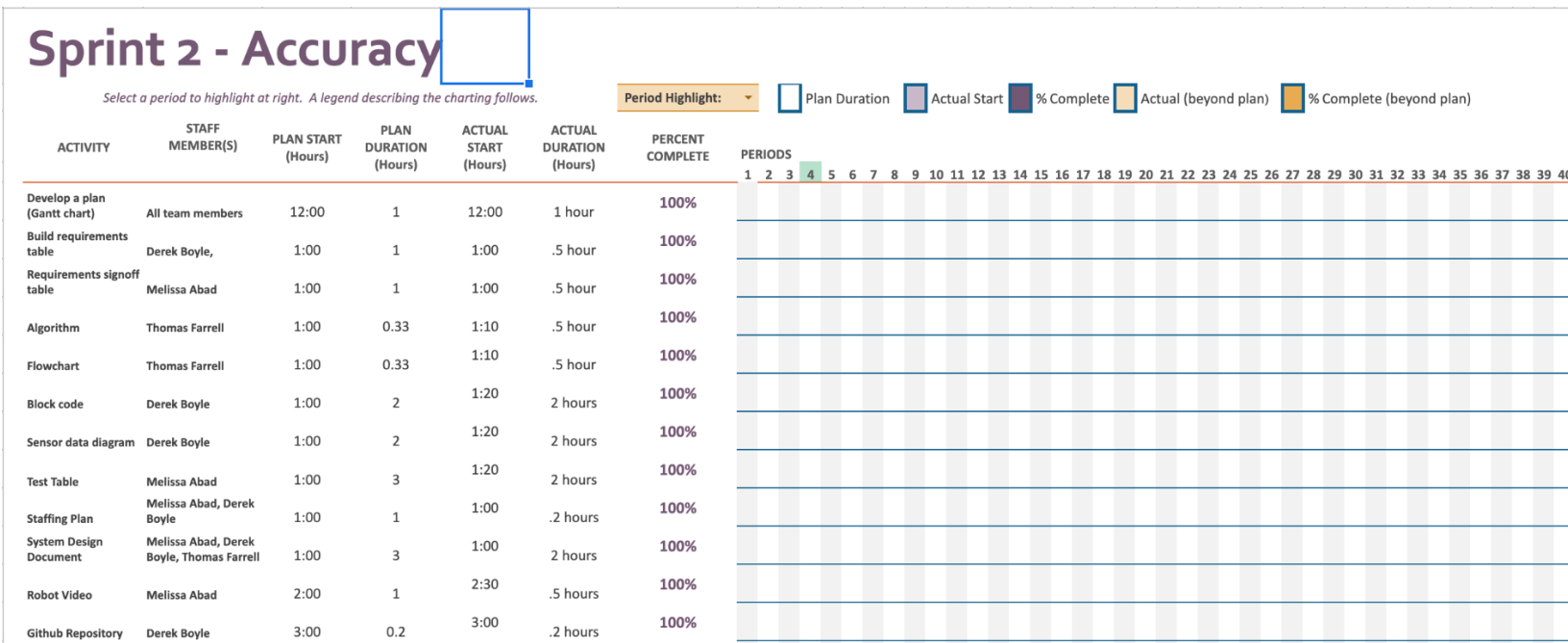
4.5 Test Plan

Reason for Test Case	Test Date	Expected Output	Observed Output	Staff Name	Pass/Fail
to get expected output: robot will run the figure eight course 5 times	11/16	Robot will run the figure eight course 5 times	Robot did half of the figure eight course	melissa derek thomas	Fail
to get the robot to run the full figure eight course	11/16	Robot will run the completed figure eight course 5 times	robot made a figure eight one time	melissa derek thomas	Fail
to get the robot to run the full figure eight course five times	11/16	Robot will run the complete figure eight course five times	robot made a figure eight 2 times	melissa derek thomas	Fail
to get the robot to run the full figure eight course five times, say i am the winner and flash multicolored lights	11/16	Robot will run the complete figure eight course five times, say i am the winner and flash multicolored lights	robot made a complete figure eight five times but didn't say i am the winner and flash multicolored lights	melissa derek thomas	Fail
to get the robot to run the full figure eight course five times, say i am the winner and flash multicolored lights	11/16	robot will run the complete figure eight five times, say i am the winner and flash multicolored lights	robot made a complete figure eight five times but didn't stop moving after	melissa derek thomas	Fail
to get the robot to run the full figure eight course five times, say i am the winner, and flash multicolored lights	11/16	robot will run the complete figure eight five times, say i am the winner and flash multicolored lights		melissa derek thomas	

4.6   Task List/Gantt Chart

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Select a period to highlight at right. A legend describing the charting follows.

Period Highlight: ▼   ☐ Plan Duration   ◻ Actual Start   ◼ % Complete   ◻ Actual (beyond plan)   ◻ % Complete (beyond plan)

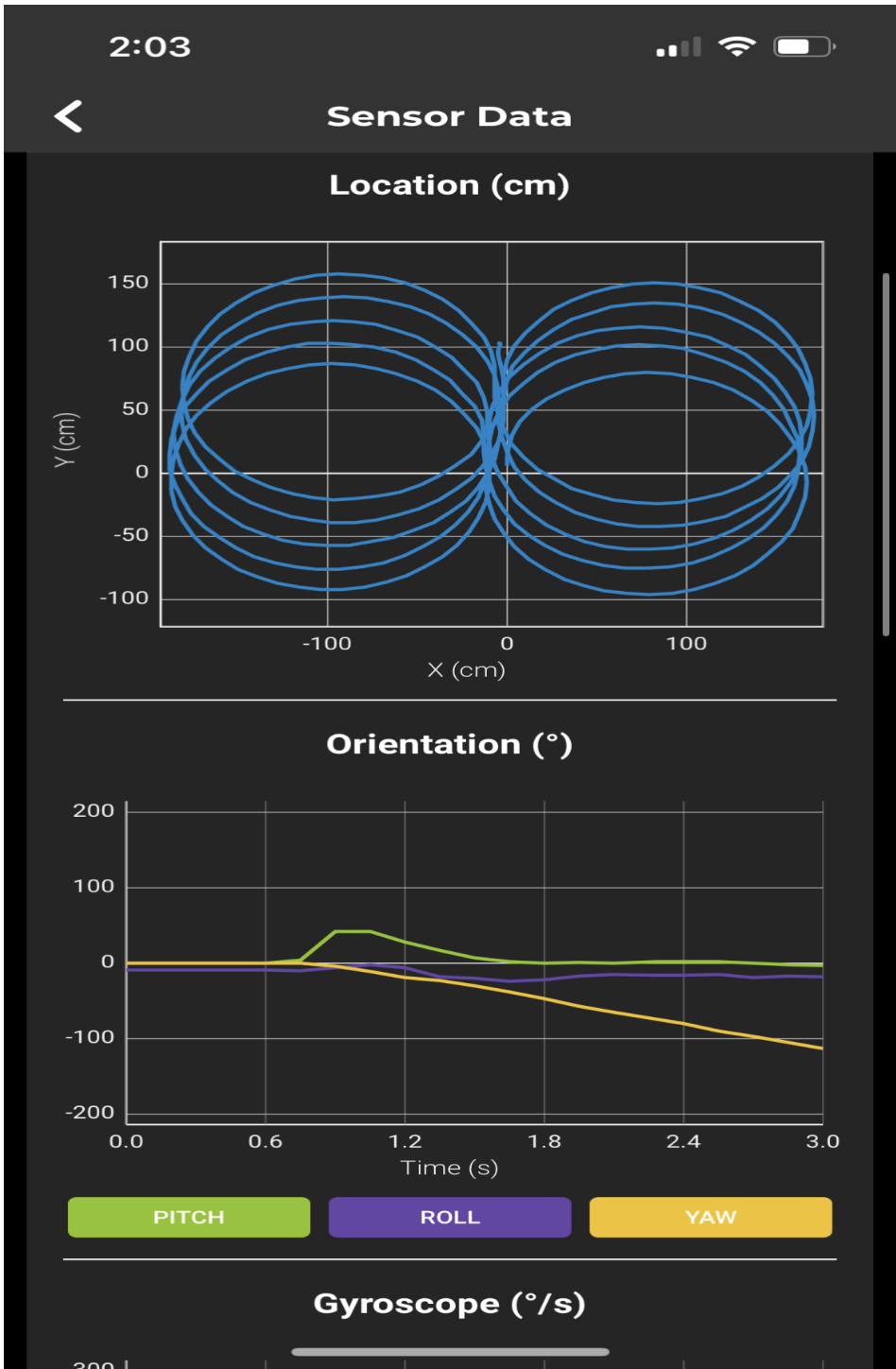| ACTIVITY	STAFF MEMBER(S)	PLAN START (Hours)	PLAN DURATION (Hours)	ACTUAL START (Hours)	ACTUAL DURATION (Hours)	PERCENT COMPLETE
						PERIODS 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40
Develop a plan (Gantt chart)	All team members	12:00	1	12:00	1 hour	100%
Build requirements table	Derek Boyle,	1:00	1	1:00	.5 hour	100%
Requirements signoff table	Melissa Abad	1:00	1	1:00	.5 hour	100%
Algorithm	Thomas Farrell	1:00	0.33	1:10	.5 hour	100%
Flowchart	Thomas Farrell	1:00	0.33	1:10	.5 hour	100%
Block code	Derek Boyle	1:00	2	1:20	2 hours	100%
Sensor data diagram	Derek Boyle	1:00	2	1:20	2 hours	100%
Test Table	Melissa Abad	1:00	3	1:20	2 hours	100%
Staffing Plan	Melissa Abad, Derek Boyle	1:00	1	1:00	.2 hours	100%
System Design Document	Melissa Abad, Derek Boyle, Thomas Farrell	1:00	3	1:00	2 hours	100%
Robot Video	Melissa Abad	2:00	1	2:30	.5 hours	100%
Github Repository	Derek Boyle	3:00	0.2	3:00	.2 hours	100%

4.7   Staffing Plan

Insert a chart/table that depicts the roles and responsibilities of each team member that worked on this project

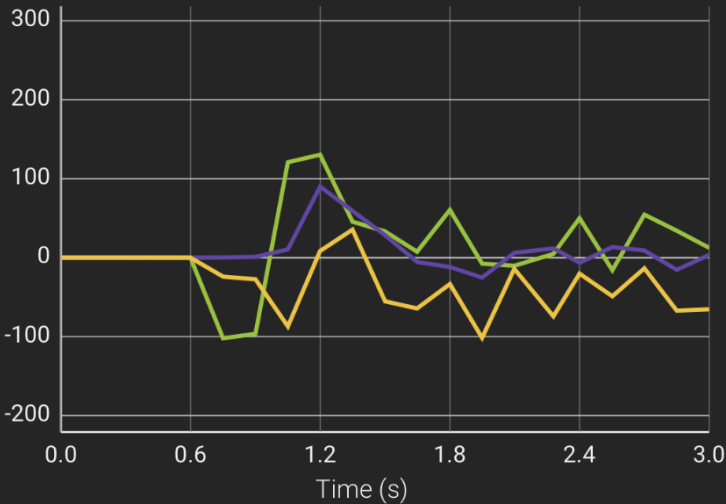| Name	Role	Responsibility	Reports To
Melissa Abad	Documenter	Documenting data and tests	
Derek Boyle	Programmer	Coding the robot	
Thomas Farrell	Documenter	Create flowchart and algorithm	

Sensor Data Diagram