Deliverable E

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Trello Board: https://trello.com/b/p8ZWMdHe/gng1103-project

Abstract

This report outlines the final decision of our concept, which seems to be a regular red light green light game for the players however the robomaster plays by its own rules. It also consists of a list of equipment along with a budget of $52, a list for a testing plan which outlines, refines and verifies the subsystems of the robomaster. Lastly the task plan, which outlines the work needed to be done by the team for the next two deliverables and this one.

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3. Introduction

The purpose of this document is to show the final design concept in detail, as well as all of the tools and parts that will be used and how they interact with each other. It contains a drawing of the game, and a detailed paragraph of the game rules. There is a table that lists the tests that will be conducted, and they are explained using the procedure outlined in the lectures. There is also a budget/costs table for the tests and upcoming prototypes. Finally, the document explains the plan from now until the end of the semester, including a list of tasks, deadlines and responsibilities.

4. Final design concept

In our final concept [*Figure 1*], players are instructed to play a simple game of red-light, green light, where they walk when the robomaster shows green and stop on red. If the robomaster detects them moving on red, it will fire a laser and eliminate them. What the players are not told, is that the Robomaster will target the red players when the red light is on, but the green players when the light is green. Also, when the players cross the midline, the targeting system will switch and target green players on red, and red players on green. Additionally, if the players cross the midline on the right side, they will be targeted at all times. No player will make it to the end. Two of the players, one from each team, will also have a flag/marker of the other colour to confuse the targeting system. The Robomaster will move in random erratic patterns and make scary sounds to induce fear and uncertainty in the players. In the case that the robomaster is unable to detect colours, targets patches will be placed on the front and back of players for the robomaster to target.

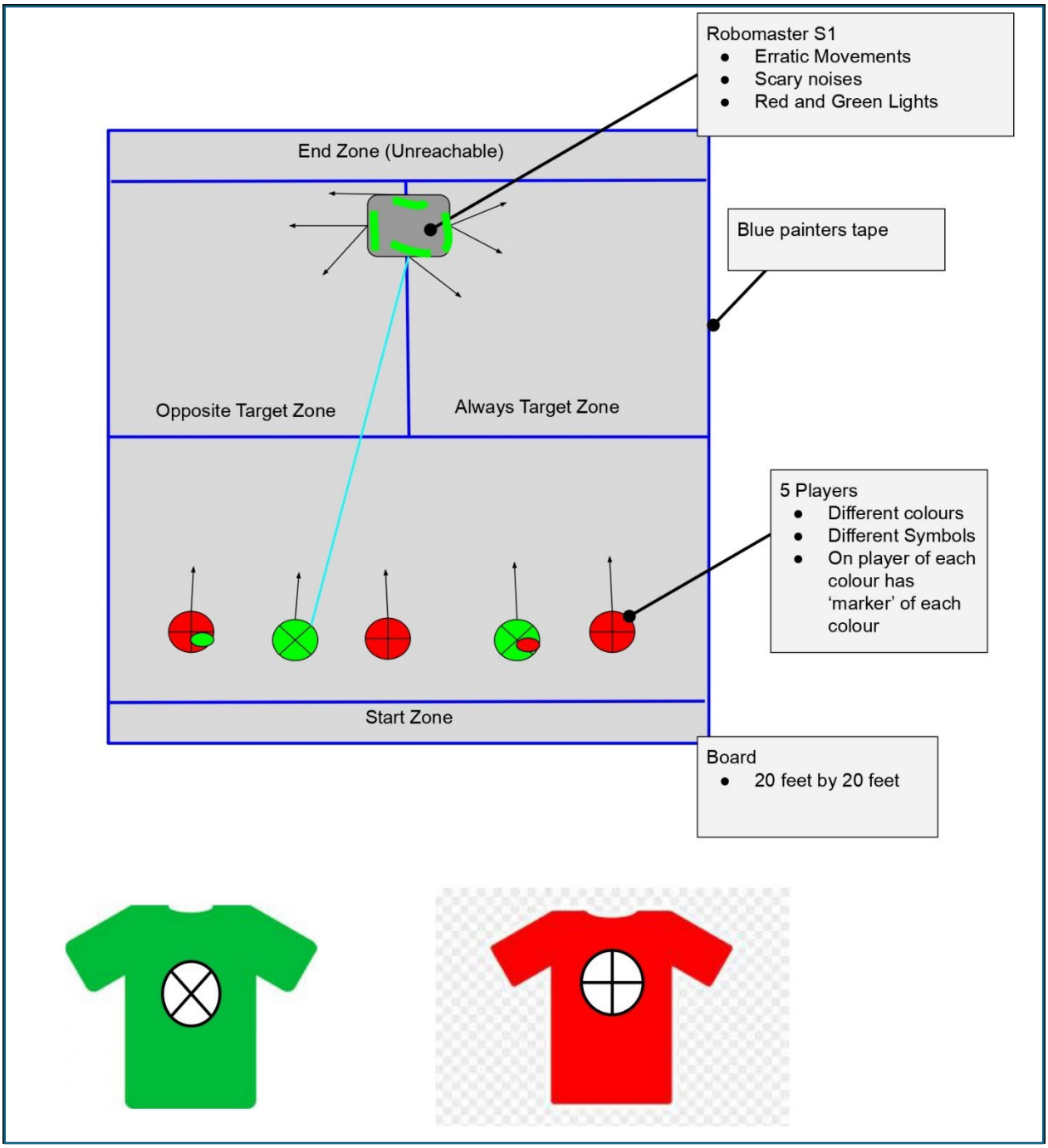

Figure 1 - Final Design Concept

5. Testing Plan

The Attached document includes a detailed testing plan for all systems that concern the plausibility/useability of the game. The testing plan covers Systems that could potentially require refinement and methods we can use to verify the integrity of the required functions.

Design Concept: <<<Describe the concept to be prototyped and tested >>>

Test Number	Reason for Prototype	Evaluation Criteria/Determine Measurables	Level of Prototype	Kind of Prototype	Metrics	Test Description	Analysis Method	Results	Interpretation	Notes	Why is this the best model choice for your stated test objective?
	Communication, Performance Measurement, Risk Management, Learning/Understanding	*What are you testing with your concept (target measurable attributes)?*	*HiFi/LoFi Focused, HiFi/LoFi Comprehensive*	*Visual, Analytical, Physical*	*What metrics will you test?*	*What specifically will you test. What is your hypothesis*	*Specifically how will you test, include things like duration, sequence of test, equipment, etc.*	*Observe and record results.*	*Pass or fail (include reason)*	1. Include location of sketch, software libraries, reference materials, etc. 2. Take notes on how you can improve your next prototype 3. Other important things to remember	
1	Targeting System	Can the Robomaster detect different colours.	HiFi Focused	Physical	True/False	Is the robomaster capable of identifying a colour and seeing it moving.	Code, then test code by running a test game with the group members.				It will give us accurate representation of the robomaster ability to detect players by the colour and or symbols.
2	Lighting system	Can colours be seen, and is there enough time for players to react, is there too much time.	LoFi Focused	Physical	Time in seconds, True/False	Can players see, and have time to react to the Robomaster changing colours, without having too much time to run to the end.	Time to cross playing area, time to take one step and stop. Visability.				It will give an idea of how well the lights on the robomaster will be seen by the players.
3	Volume	Can the robot be heard by players?	HiFi Comprehensive	Physical	True/False	Is the robot master capable of being heard with loud background noise.	Music will play on speakers around the robot, then it will play its own sounds to see if it can be heard.				It will give insite on the ability for the players to hear the robomaster over the sroundings such as the: sound of the robomaster moving and sound of srounding noise outside of the game.
4	Laser pointer	acuracy and reliability of laser pointer	Hifi focused	Analytical	Distance in CM, True/False	Will robomaster be able to acuratly, and quickly shine its laser on targets	Distance between ideal target and where the laser hits				It will give us an acurate idea of the precision of the robomasters laser pointer
5	Change in targeting system at half way	Colour detection, Code	LoFi Focused	Physical, Analytical	True/False	Will the robot be able to differentiate the two different areas within the main area.	Test Code, and see how the robot reacts when focusing on a certain section, will it react differently or the same.				It will give us incite on the robomasters ability to change its rule set based on the location of player(s)
7	Elimination system	Can the robomaster signal to the player when they are eliminated	HiFi Comprehensive	Analytical	True/False	Can the players see and hear that they have been eliminated.	Does the robomaster signal to the player(s) that they have been eliminated and can the player understand that they've been eliminated				It will give us an accurate reading of how the players will be indicated to be eliminated. This test is comprehensive because other factors need to be considered such as the laser pointer, volume of the robomaster, and volume of the sroundings.

Table 1 - Testing Plan

Testing.xlsx

6. Budget/List of equipment/software

The Attached Document is an Excel spreadsheet that is composed of the required equipment, software, and items required for this project as well as a budget list for individual items.

Material / Component	Software / Hardware	Cost	Used for
DJI	Software	$0	Code Robomaster S1
Red pinnie (x3)	Hardware	$15	Algorithmic bias
Green pinnies (x2)	Hardware	$10	Algorithmic bias
Robomaster S1	Software and hardware	$0	Robot players compete against
Pylons(x3)	Hardware	$8	Obstacles
Blue Painters Tape	Hardware	$7	Mark play area boundaries
Trello	Software	$0	To-do list and project planner
Paint Markers	Hardware	$12	Colouring targets
		Total: $52	

Table 2 - Budget and Materials

Project Budget and Materials List.xlsx

7. Task Plan

Task	List of subtasks	Due dates	Roles
Deliverable E	• Abstract • Introduction • Budget • List of figures • List of tables • Task planning • Conclusion	• Oct 27	• Lucas • Owen • Sam • Owen • Jacob • Sam • Lucas
Client Meeting	• Make Presentation • Presentation • Take notes	• Oct 22nd	• Everyone • Everyone • Owen
Deliverable F	• Make Prototype • Documentation • Prototyping test plan • Make presentation • Introduction • Analysis of prototype • Update task list • Conclusion • Abstract	• Nov 3rd	• Everyone • Owen • Sam • Everyone • Jacob • Lucas • Jacob • Owen • Sam
Deliverable G	• Make Prototype 2 • Documentation • Prototype test plan • Update task planer • Introduction • Prototyping (the “why”) • Conclusion • Abstract	• Nov 10th	• Everyone • Owen • Owen • Sam • Jacob • Sam • Lucas • Lucas
Deliverable H	TBD	• Nov 23rd	TBD

Deliverable I	TBD	• Nov 27th	TBD
Deliverable J	TBD	TBD	TBD
Deliverable K	TBD	• Dec 3rd	TBD

Table 3 – Task Plan

8. Conclusion

In conclusion, we brought together multiple important aspects of the prototyping phase to create a more complete project plan. By creating and filling out the cost estimate table, testing plan, design concept, and design plan, we have condensed multiple important factors into one document to refer to in the future when changing or following the plan. These tables and plans will be integral tools in refining and keeping the final solution as accurate to the requirements as possible. Our team will continue to update the tables as the project progresses.