

Deliverable G

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

Abstract

This deliverable focuses on the development, testing, and refinement of the second prototype of the robomasters targeting system. Building off of the feedback from the first prototype which led to significant updates to the design of the system and the functionality. The key objectives for prototype two is ensuring the targeting system, gamble angle and sound systems worked in full.

Prototype two had code allowing the Robomaster to identify players and target them through the use of number cards. The testing focused on evaluating the system reliability, sound audibility, number card recognition, and displaying the right colours corresponding to players. The results demonstrated successful function of each aspect measured.

This deliverable also includes a test plan for prototype three and task plan for future.

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Introduction

In deliverable G, the team has created a second prototype iteration, with changes and improvements made depending on the feedback received from the Client, TAs and other class members. An updated version of the storyboard, flowchart, task plan, and code has been created to prepare for more in-depth testing of our prototype. As well, the new iteration of the prototype includes outlined connections to the first prototype and an analysis of the testing performed with the second prototype.

Prototype Objectives and Relation to Prototype I

The goal of our second prototype was to confirm that the following systems were Functional, both in theory and practice:

- Targeting system
- Gimbal angle
- Sound Systems

Based on the feedback received from our first client meeting, we reconsidered the prospect of targeting players by pinny colour and instead relying solely on the symbols provided with the Robomaster, to ensure that the robot targets the player more reliably. Secondly, we were given feedback regarding the infrared distance sensor. We were told to do more research to ensure that the Robomaster had an infrared sensor. Upon further research, we found that the Robomaster did not contain an infrared sensor, and in response to this new information, we changed the design of the code to make sure that the infrared sensor was not a part of the game, and the robot would target simply based on the targets and the colour the robot is showing at that time.

Prototype II

For our prototype II, the team created a functional code that could be tested on the robomaster. The things this code does is identify players based on a number card on their chest, and make a gun sound / flash their colour (on their card) to signify that they are eliminated. It will target players 2, 4 and 5 when the light is red, and 1, 3, 5 when the light is green. The main feedback we got from the clients from the thrid meeting was that the stuffed cat dying at the end was “too emotional” and “might make people cry”, we we changed it to a plastic dinosaur, so people feel less attached, and it is easier to maintain than a stuffed animal.

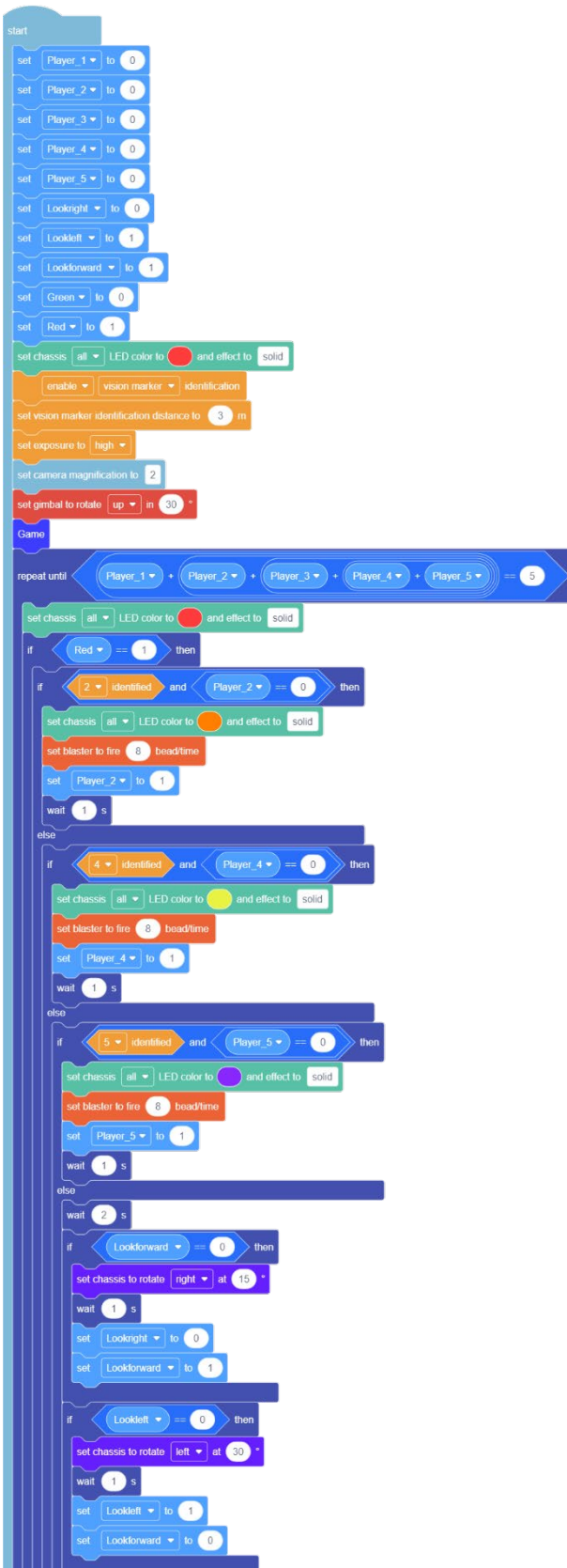


Figure 1 - Code (1)

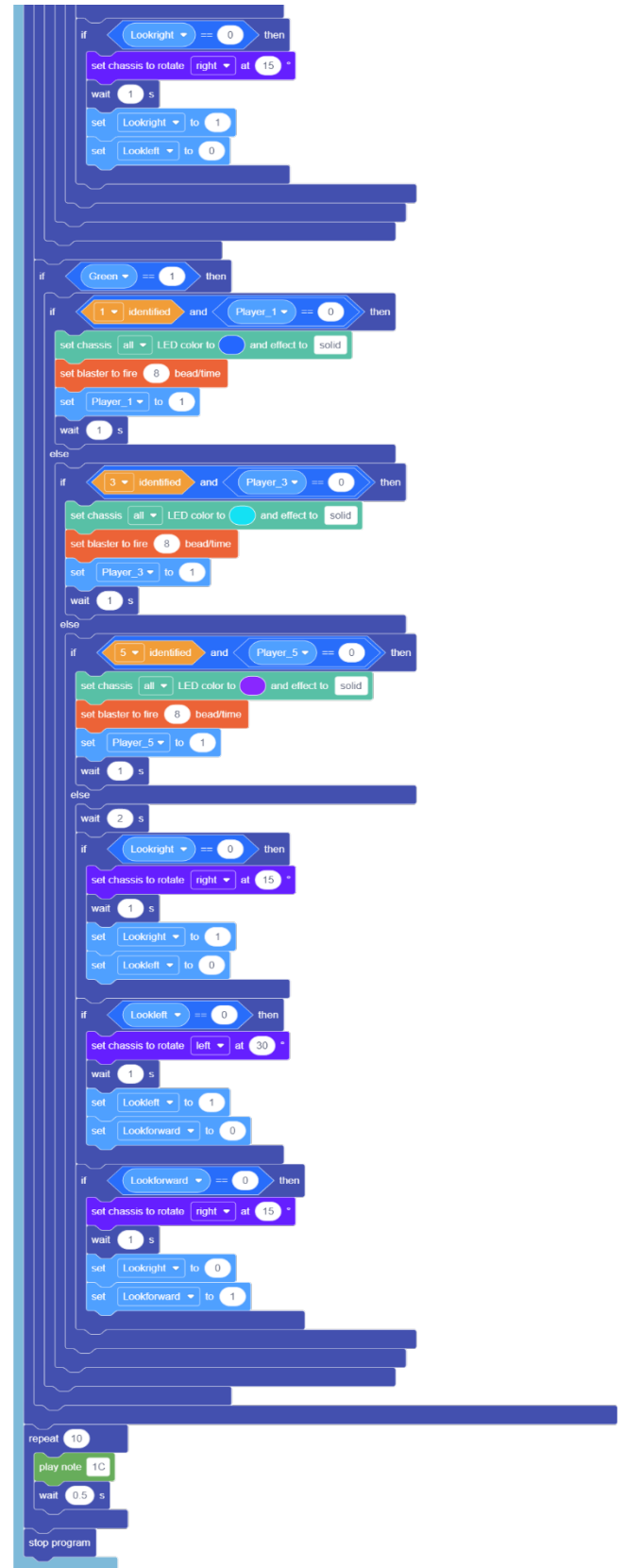


Figure 2 – Code (2)

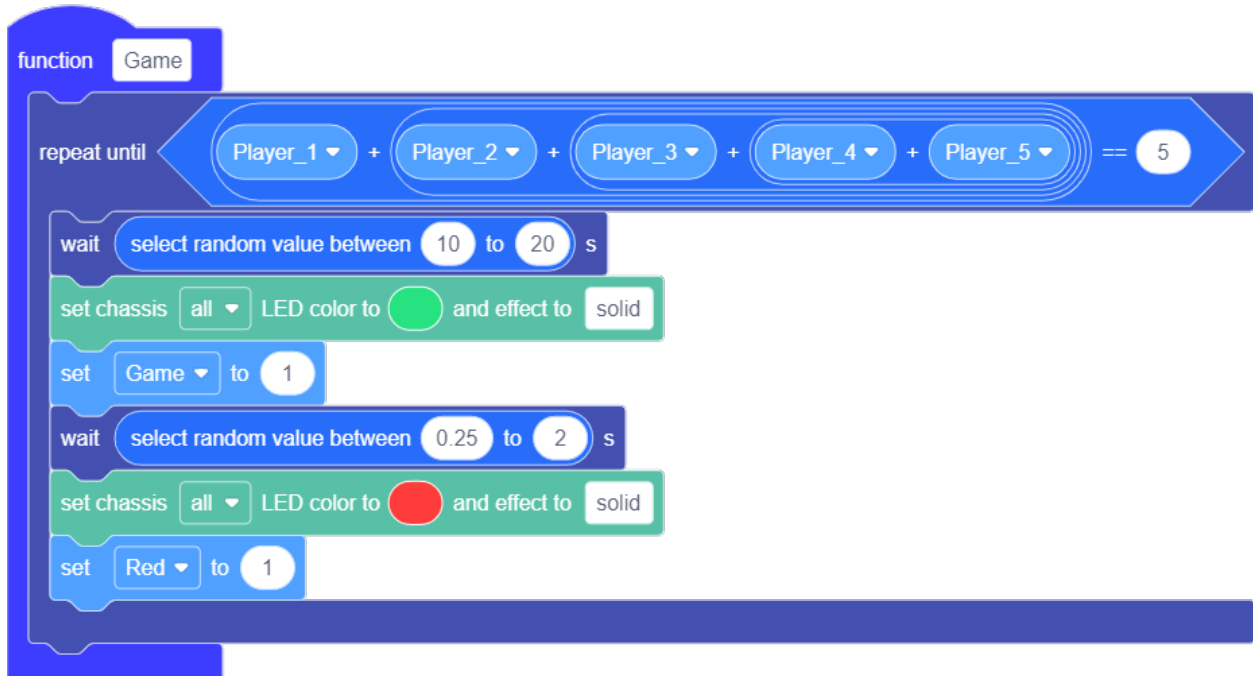


Figure 3 – Code (3)

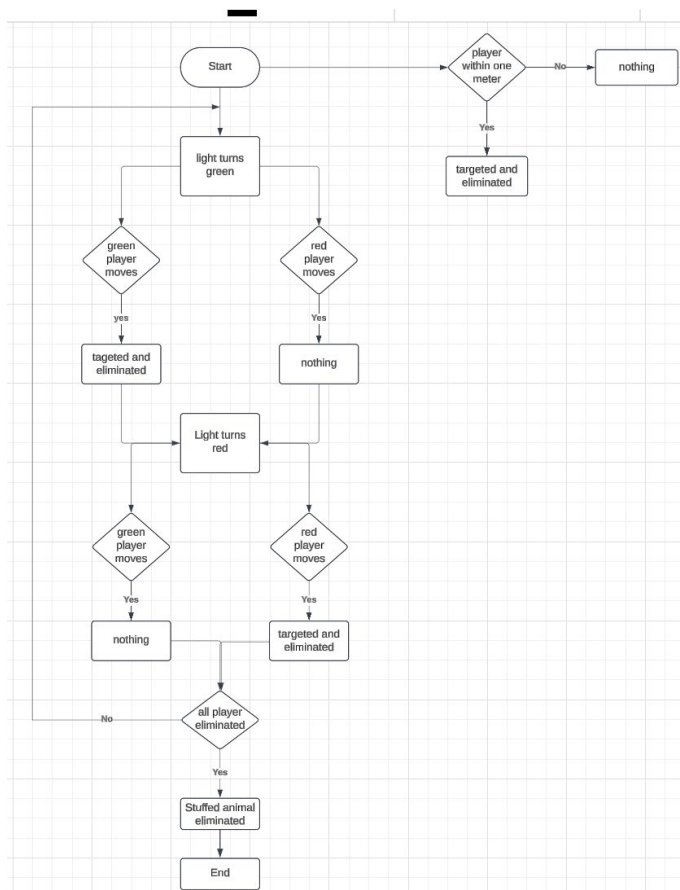


Figure 4 - Flowchart

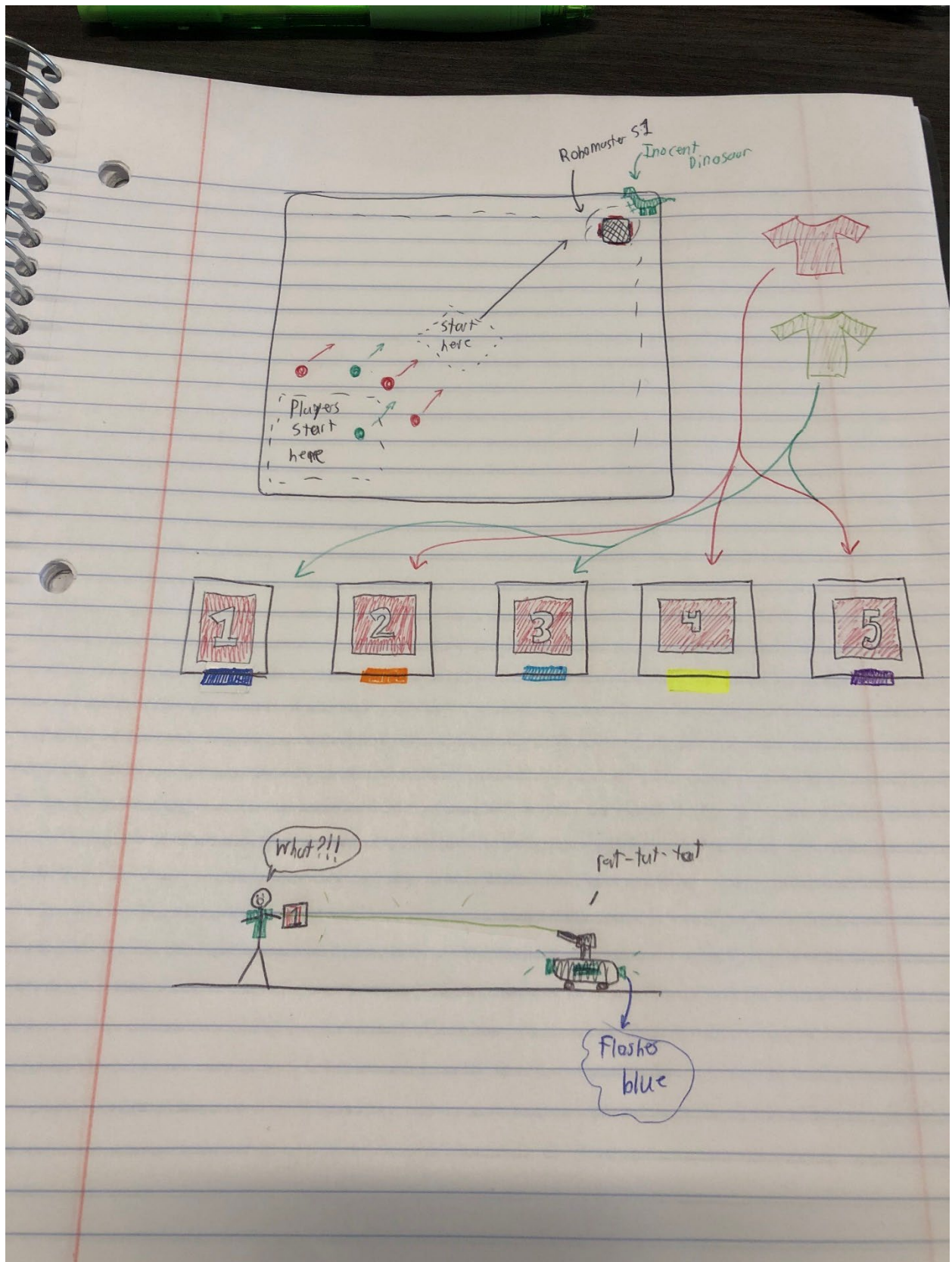


Figure 5 – Prototype II

Prototype Analysis, Testing and Results

| Test Description | Metric | Results | Pass/Fail | Comments/changes |
|--|--|-----------------------------|-----------|--|
| Can sound be heard in a loud room: Had people talking loudly in a room, and another person down the hall. | Can the robomaster be heard: True/False | True | PASS | We were unable to add the robomaster saying which player was eliminated and resorted to colours. |
| Can the robomaster look around for cards. | True/False | True | PASS | Instead of rotating the gimbal, the whole robot was turned. |
| Can the robomaster detect each card once, and only once. | 1 detection True/False | 1 (For each player) True | PASS | The robomaster successfully identified each number card only once. |
| Can each colour be seen with the correct number? | True/False | True | Pass | The robomaster showed the right colour when it identified a number card. |

Table 1 – Testing



Figure 6 – Robomaster Targeting system

Prototype III Test Plan

[Test Plan - Prototype III.xlsx](#)

Project Task Plan

| Task | List of subtasks | Due dates | Roles |
|---------------|---|---|---|
| Deliverable G | <ul style="list-style-type: none"> Make Prototype 2 Documentation Prototype test plan Update task planner | <ul style="list-style-type: none"> Nov 10th | <ul style="list-style-type: none"> Everyone Owen Owen Sam |

| | | | |
|---------------|--|---|--|
| | <ul style="list-style-type: none"> • Update Trello Board • Introduction • Prototyping (the “why”) • Conclusion • Abstract • Coding | | <ul style="list-style-type: none"> • Jacob • Sam • Lucas • Lucas • Owen |
| Deliverable H | <ul style="list-style-type: none"> • Update Trello Board • TBD | <ul style="list-style-type: none"> • Nov 23rd | TBD |
| Deliverable I | <ul style="list-style-type: none"> • Update Trello Board • TBD | <ul style="list-style-type: none"> • Nov 27th | TBD |
| Deliverable J | <ul style="list-style-type: none"> • Update Trello Board • TBD | TBD | TBD |
| Deliverable K | <ul style="list-style-type: none"> • Update Trello Board • TBD | <ul style="list-style-type: none"> • Dec 3rd | TBD |

Table 2 – Task Plan

Conclusion

In conclusion, prototype two shows significant improvements to the Robomaster targeting system, addressing feedback and discoveries from the first prototype, and updating functionality. Key updates include a revised targeting system using number cards and practical design changes to improve user experience. Insight from this prototype and testing will guide further refinement of the next prototype.