HCI Design Brief Example

Project: *Putting Pro Simulator*

The Putting Professionals

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S Number: S1234567

Workshop: <day, time, instructor>

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1 Introduction

1.1 Purpose of this Document

This document has been prepared for <*client* details>. The purpose of this document is to detail the work and findings of the design process when developing a new product for the client, and eventually provide a solution the client is looking for. This document includes <*overview of different sections*>

1.2 Scope of this document

This design document will cover the background of the project, what the problem is addressing and the value it will provide. It will also discuss the target audience, usability objectives, the design requirements as well as including a low fidelity prototype of the project. It will not include a discussion of implementation of the product, or the broader training program that will use this product.

1.3 Background

In golf, putting takes up more strokes per hole at 43% of all strokes in a game, which is almost half the golfers score. Golf instructional literature usually focusses more on kinematics than improving the golfer aim or green reading ability.

This is unusual because of the fact that 60% of the shots missed are caused by misreading the green.

1.4 Problem statement

The Putting professionals have contacted us through a need to improve the putting ability of their players. The problem that they wish to address is to improve the player's competency to read the green, ability to select the correct line, and the ability to strike the ball at a suitable power.

The benefits are great for both the client and the player. The client can develop a new effective way of teaching the player better ways to putt and increase their putting ability.

1.5 Proposed solution

In order to solve the putting improvement problem, we propose an interactive putting simulator that allows the player to test and measure their green reading and line selection, and to practice different putts. This solution will be <*description of the solution: hardware used, and basic functionality provided*>.

2 Audience

2.1 User Research - Desired

A site visit would be a good start to the research, visiting a golf course or golf club, this way you can observe the golfers while they are putting to see what they do to hit the ball into the hole successfully and the mistakes they make when they miss.

Conducting contextual interviews with the golfers could ask for their opinions directly such as if they would be interested in a simulation to improve their putting abilities.

You could even do a full ethnographic study but that and the contextual interviews would require a long time to receive the important information required.

This is where using focus groups would be the most useful to receive the information about the audience, even sending out surveys and questionnaires beforehand to receive a large amount of basic information about the different demographics to use as discussion topics for the focus groups.

But the most important part is to analyse the information received and see what audience exactly the product appeals to and who will be using it.

2.2 User Research – Actual

I was not able to go to a golf club and interview players, and conducted general research instead. According to statistics from the Brain Research Institute, the most common profile for golfers is:

- 50-59 years of age
- 77.5% are male
- 79% have an average household income of over $95,000.

however golfers can be any age, gender or income.

The main target audiences for this product would be:

- Casual players who want to improve their putting, generally in the junior age range.
- Younger golfers around the 20-39 years age group. They would be players that need training and are willing to turn to newer technology that they would have competences and knowledge to use.
- Of long-term adequate golfers in the 40-69 years of age range, this audience is the type of player who plays socially, recreationally and for business on a regular basis. They are willing to try new technology to improve their putting ability.
- Professional golfers of any age who want a way to practice and improve their putting skills from home without going to the golf course.

For all of the target audiences, they would have to be able to afford the required setup for the product if they wished to be able to use it at home. The product can also be adopted by golf clubs that could be setup in a designated room for members to use, but that would also require an expensive membership to join the club. The space required for the setup is only 2 meters by 1.5 meters, the target audience that would be buying this product would have the income to afford a big enough home to be able to spare that amount of room to use it.

2.3 Human Factors

There are many human factors to consider when designing this product and how it will affect each player's experience. Taking this into consideration I will try to accommodate for as many demographics and disabilities as possible.

<This material could be provided in a table for clarity.>

Vision is required for the use of the product, but it can be adjusted for people's visual differences such as *<discussion of vision needs relevant to the identified players>*. The display will run at *<discussion of technical choices that will suit the vision needs of the player>*.

Hearing is not required for the use of the product although it is used and does enhance the experience. For Deaf players, *<list of design decisions that make the product usable for Deaf and hard-of-hearing players>*.

Touch is a very important part of golfing for the player, and its importance is carried over to the simulation as well. Through the use of *<selected design decisions to support touch for this product and this player group>*. This is the main method of interaction in the simulation so the player requires full use of both of their hands.

The simulation would have a unique controller that would be a golf club with a tracker on the end, that would be the same size, shape and weight as standard clubs, and would represent the golf club inside the simulation. This would also give the player the option to change the club from left or right handed in the settings.

3 Usability

3.1 Usability Tool

A Survey tool was used to generate broad feedback to learn about the needs of golfers. I had created a Survey (figure 3.1) to send to as many golfers as possible from the local golf club, but I was unable to get to the location as planned and received no responses. I did however contact a family member that plays golf and was able to receive a response to the survey from them, and they wished to remain anonymous.

The survey had questions that were able to determine their demographic, such as age, gender and income. It was also able to determine which audience group the surveyed person belonged to, as well as what they believed their putting skill level was at.

The big questions that it asked were if they had any prior experience with the technology or if they would be willing to try a golfing simulator to improve their putting ability, as well as what they would expect from a putting simulator, and any features they would like from the simulator they can't get from real golf.

Golf Putting Survey

Name: Anonymous

1. Age: 59
2. Gender: Male
3. Income:
   a. >$20,000
   b. 20,000 – 40,000
   c. 40,000 – 60,000
   d. 60,000 – 80,000
   e. 80,000 – 100,000
   f. <100,000
4. What kind of golfer do you most identify as
   a. I don't play golf
   b. Putt-putt player
   c. New golfer just starting out
   d. Long term golfer
   e. Professional golfer
   f. other
5. Are you part of a golf club?
   a. Yes
   b. No
6. How often do you play golf? Once a month to every two weeks
7. What are you worse at?
   a. driving
   b. putting
8. Are you?
   a. left handed
   b. right handed
9. competency to read the green, 2 / 5
10. ability to select the correct line, and 3 / 5
11. ability to strike the ball at a suitable power. 2 / 5
12. How competent are you at using technology? 2 / 5
13. Have you ever had a virtual reality experience before? Yes / no
14. Would you be willing to try a virtual reality golfing simulator to improve your putting ability? Yes / no
15. What would you expect when you imagine a virtual reality putting simulator?

    That it would be as close as an experience to the real thing as possible and Record keeping of my putting statistics

16. Are there any features you would like to see from a virtual reality putting simulator that you can't get from real golf?

    Ball tracking and to know how far away the ball is from the hole in exact measurements

Figure 3-1 Survey

3.2 Usability Findings

My findings from the survey was just a small glimpse into the target audiences with only one group being represented by a single response (Figure 3.1).

Attribute	Finding
Player characteristics	59-year-old male that is a long-term golfer with an income over $100,000 that belongs to a golf club
Playing frequency	only able to play once every 2 weeks to a month and therefore not able to practice their putting often
Worst golf skill	Putting - ability at an average of 2 out of 5
Technology competence	Low - willing to give it a try to be able to improve their putting ability.
Requested features	Ball tracking, to be able to always see where the ball is and know how far away the ball is from the hole in exact measurements to better keep track of putting skill.

For this player, the simulator would be of interest. It needs to be easy to play based on their technology competence, and support their desire to train more easily and more often. The technology should enable the player to see more detailed feedback (such as actual measurements) that are not available when putting at the club.

3.3 Usability Objectives

The usability objectives for the Putting Pro Simulator are:

90% of the players are able to navigate to and start a golf simulation from the start menu within 2 minutes.

95% of the players use their hands to navigate through the menu within 30 seconds of starting.

At least 70% of the player interface modules on the screen can be identified correctly by 80% of the players (wind gauge, course map, menu button, etc.)

4 Design

4.1 Visual Design

The visual design takes the “Don’t make me think” approach because a lot of the target audience have varied competency with technology. Simple menus will be used with a maximum of 4 options on the screen at a time, not including the back button. The back button will be in an easy to reach location and more obvious and a different colour, the back button also has a backwards arrow signifying to go back (figure 4.1). It will have large buttons (figure 4.2) that are easy to touch with your hands so you don’t accidentally press the wrong button, and with the simple menu you will be able to get to putting quickly.

Conventions used include a simple and consistent layout, and matching each button with a symbol for easy understanding of the option (Figure 4.3). The simulator uses grid lines to best analyze the terrain, as well as highlights traveling down the lines showing elevations (figure 5.4).

The products **navigation** is consistent: with two clicks from the main menu the player should be able to reach their desired action, whether that is starting a game or changing a setting in the options. The menus are short to support scanning, and have easily defined symbols associated with the buttons.

All **text** used within the simulator will be bold and have large letters that are widely spaced to be easily read as small text is difficult to read. The font picked will be the sans-serif font Verdana because it is a very simple blocky font that is easily readable when bold, perfect for the simulator environment and the needs of the players including people who are less comfortable with technology (Figure 4.2).

The menu's **colour palette** (figure 4.4) will mainly be a light blue for the background and green menu buttons. These colours are calming to the player and also represent the natural colour on the golf course. When selecting options, the selected option will be green and the unselected options will have a grey theme to indicate they are not selected (figure 4.2). When a player wants to go back a screen, they will have an option to press the back button in the top left (Figure 4.1). It will have an arrow symbol, the word back and will be displayed in red for contrast and to show that it's an exiting button.

Images are not heavily used except for the symbols on the buttons. The tutorial option will walk through how to use the simulator and also show images and screenshots of examples to help explain.

Sounds are used within the simulator include click sounds when pressing a button to indicate it has been successfully clicked, and the sound of hitting the ball to give the player affirmation they have made contact. This sound is critical, as players use the sound as an indicator of a good or a poor hit. Ambient sounds will be used to immerse the player, such as birds chirping and the sound of the wind in the trees.

Figure 4.1: Back button

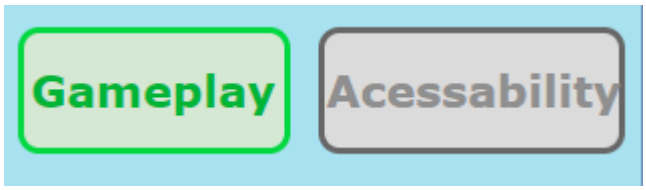


Figure 4.2: Selectable Options

Figure 4.3: Button Icons

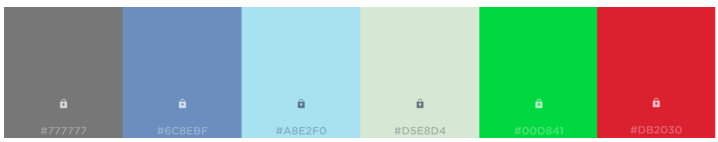


Figure 4.4: Colour palette

5 Prototype

5.1 Stage One – Low-Fidelity Prototype

Below are the Figures 5.1 to 5.4 which make a up a low fidelity prototype in the form of a storyboard, demonstrating a few of the functionalities of the product. Figure 5.1 is the Main menu that is presented every time the player starts the program. There are then 4 options they can choose from which are putting, Statistics, settings and the exit.

The **Home page** is where the player starts and can be a place to reorient themselves when they get lost. There will be a button on the golf club to access the menu from in-game for ease of use. The Simulator's name will stretch across the top of the screen (figure 5.1).

The **main Menu's buttons** are:

- **Putting** takes you to a menu with Start Game, Course Difficulty, Course Selection and Tutorial (Figure 5.3). The tutorial provides a quick start guide on how the simulator works and how to use it, it involves photos and screens shots and talks you through in a step by step way.
- **Statistics** which will give a record of your games played, and in-depth analysis on playing improvements and what you need to work on.
- **Settings** menu (Figure 5.2) where you can change Gameplay options such as the Measurement type (Feet and Metres), Display or hide Grid Lines, change the Volume using a slider bar.
- You can also change Accessibility options including club handedness, Colour Palette adjustments for better contrast and visibility, and Language which is displayed with flags.

Once the player has chosen the course they wish to practice on they can press the start button to start the simulation and this will place the player on a virtual green represented by figure 5.4. This is a very low fidelity concept of the simulation shown from a 3rd person point of view. The purpose of the diagram is to show the grid system they will overlay the green as well as arrowed highlights that indicate the direction of the slope, from the player's point of view. This will help display the different elevations of the ground to increase the player's ability to read the green.

Figure 5.1: Main Menu

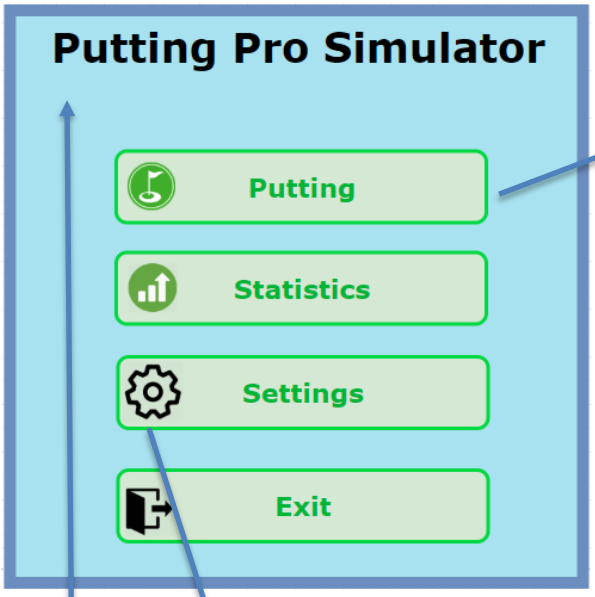


Figure 5.3: Putting Menu

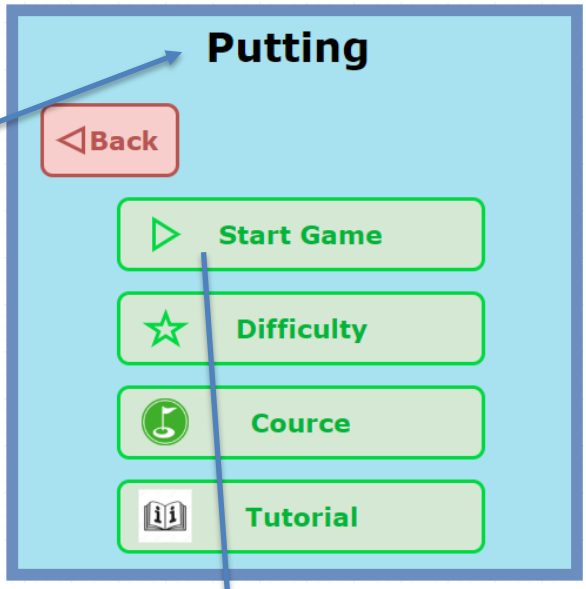


Figure 5.2: Settings Menu

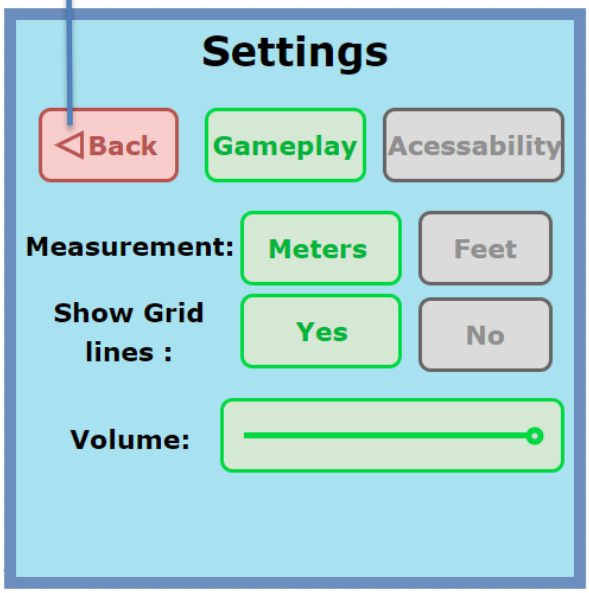
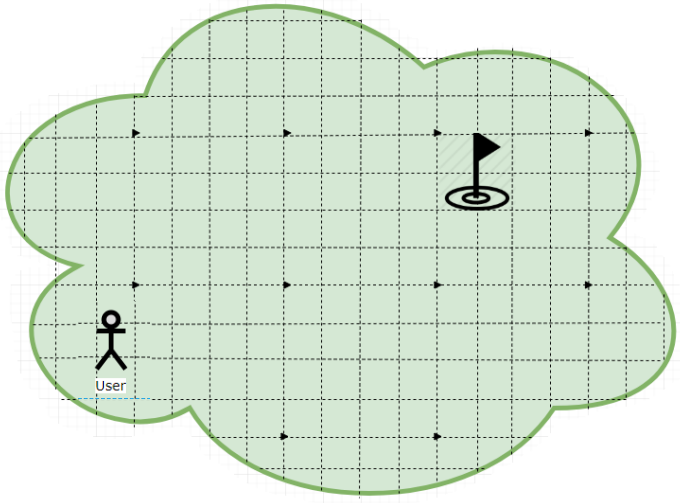


Figure 5.4: Putting Simulation



6 Discussion – Player Involvement

My use of player involvement for the project has been limited as my access to golfers is low. I have been able to survey one golfer, and access several people for usability testing. *<Discussion of the interaction with the participants and how that helped with understanding the golfing scenario and the influence on the simulator designs. Identification of issues encountered, and what would be done differently if able to do this again. Discussion of how users would have been involved if able to do this again.>*

7 Testing

7.1 Test Plan

7.1.1 Testing Purpose and Goals

During this iteration of tests, I have set out to achieve the goal of clarifying the projects design. The purpose of the test is to find difficulties and problems navigating through the menus and to answer the questions:

- "What are the obstacles that the player comes across when they try to reach their desired objective through the simulator menus?" and,
- "How will the player interact with the menu interface?"

Another purpose is to test the identifiability of player interface modules and answer,

- "Are the players able to identify the modules for what they are and what they are used for?"

7.1.2 Participant Characteristics

The Characteristics of the participants in the testing is broken down into the main target audiences for the product. It would also be good to test with some people who have no golfing experience to find a way to introduce players to the concepts of putting, and to find smaller demographics as well as different ideas from outside the golfing community.

Ideally having five players from each target audience would yield the most accurate results, but this is not possible for this assignment. At least one player for each characteristic for a total of five players would be acceptable.

Characteristic	**Desired number Of participants**
Participant Type	
No golfing experience	2
Junior players	3
Younger golfers	3
Long term regular golfers	3
Professional golfers	3
Total number of participants	14
Playing Frequency	
Infrequently: 0-5 times per year	4

Moderately: Monthly	6
Frequently: Weekly	4
Types of play	
Just for fun	4
Mostly leisure	5
Competition	5
Age	
<12	2–3
12–20	2–5
21–40	3–5
41–65	3–3
>65	2–3
Gender	
Female	7
Male	7

7.1.3 Method

The approach used in this stage of testing is <*name the testing approach, and describe why it is a good choice*>.

The test sessions will be <*time*> long. I will use 15 minutes of each session for pre-test introductions and post-test debriefing interviews. The sessions will take place at <*location*>.

Pre-test arrangements

Have the participant:

- Review and sign nondisclosures and recording permissions.
- Fill out a background questionnaire

Introduction to the session (2 minutes)

Discuss:

- Participant's experience with this kind of process.
- Importance of their involvement in the study.
- Moderator's role.
- Room configuration, recording systems, observers, etc.
- The protocol for the rest of the session.
- <*any specific techniques you will use*>.

Background interview (3 minutes)

Discuss the participant's:

- Experiences with golf and putting
- Reasons for wanting to improve their putting

Tasks (30 minutes)
Participants will work through a putting interaction with the prototype simulation. Full details are provided in section 7.1.4.
Post-test debriefing (10 minutes)
• Ask broad questions to collect preference and other qualitative data. • Follow up on any particular problems that came up for the participant

7.1.4 Task List

Task 1:	Interact with the player interface to navigate through the menu
State:	Paper prototype of the player interface of the putting simulator representing the navigational menus
Successful completion:	The player correctly interacts with the interface
Benchmark:	The player uses their hands to select any button to change the current menu within 30 seconds
Task 2:	Start a putting simulation
State:	Paper prototype of the player interface of the putting simulator representing the navigational menus
Successful completion:	The player correctly navigates to, and starts the putting simulation
Benchmark:	The player selects the correct path to the putting simulation with one or less mistakes within 2 minutes
Task 3:	Change the course and difficulty of the putting simulation
State:	Paper prototype of the player interface of the putting simulator representing the navigational menus
Successful completion:	The player correctly navigates to, and interacts with the difficulty and course settings
Benchmark:	The player changes the difficulty and course from the default choice within 1 minute
Task 4:	Return to the Main Menu
State:	Paper prototype of the player interface of the putting simulator representing the navigational menus
Successful completion:	The player returns to the Main Menu that they originally started on using the Back button
Benchmark:	The player returns to the Main Menu that they originally started on using the Back button within 30 seconds

Task 5:	Change the golf club to left handed mode and turn down the volume
State:	Paper prototype of the player interface of the putting simulator representing the navigational menus
Successful completion:	The player makes their way to the Setting menu and changes the club to left handed mode and turns the Volume down lower than it started
Benchmark:	The player is able to change the settings within 2 minutes

Task 6:	Identify and explain the different player interface modules within the actual putting simulator
State:	Paper prototype of the player interface of the putting simulator representing the navigational menus
Successful completion:	The player is able to identify the player interface modules
Benchmark:	The player is able to identify at least three of the player interface modules within 5 minutes

7.1.5 Data

To answer the question, "What are the obstacles that the player comes across when they try to reach their desired objective through the simulator menus?" I will collect data for:

- Time it takes the player to reach their goal
- Number of wrong routes the player has taken
- The appropriateness of options within the menus
- The number of tasks that need to be explained further or require assistance

To answer the question of, "How Identifiable are player interface modules?" I will collect data for:

- How many modules are identified
- Number of the modules identified correctly
- How long it takes to identify a module
- The usefulness of the modules
- The number of modules that need to be identified for the player

7.2 Test Results and Analysis *(could be presented as a table)*

The testing was conducted on the 3rd of October with a total of three participants. This was much lower than the ideal amount of 14 participants and also lower than the recommended amount of 5. Two of the participants belonged to the main target audiences, a casual player and a long-term regular golfer. The third participant did not play golf, which gives us an outsider perspective for players who are new or have no experience with golf.

The players were presented with a paper prototype representing how the player would navigate through the menu's. Figures 7.1 to 7.8 in Appendix A show the low-fidelity prototype used to complete the tasks. These do not represent the final design and were used solely for testing usability.

The test results show that the players are able to complete all the tasks to a successful standard under the time limit and with minimal mistakes. The results were very consistent between all the participants. The main issue that each test highlighted was in task five where the player had to change the golf club to left handed and turn down the volume. Each player could navigate to the settings menu and turn the volume down. However, finding the left-handed setting proved to be more difficult, as the player had to switch the displayed options from Gameplay, which is the default window when you enter the settings page, to Accessibility.

The players were all able to identify and explain the different player interface modules within the actual putting simulator within the time limit. All participants missed one option: the wind gauge in the form of the flag for the hole. A detailed account of the responses and notes for each participant as well as their consent forms are located within Appendix B and C.

7.3 Findings and Recommendations *(could be presented as a table)*

The results from these tests show that generally the design of the menus is simple and easy to use, as players are able to navigate to their desired location with ease, with the one exception of finding the left-handed option, answering the question "What are the obstacles that the player comes across when they try to reach their desired objective through the simulator menus". I believe this to be an issue because the buttons to change the settings options look exactly like the rest of the settings. If the gameplay and accessibility options were distinct from the other options in the form of tabs to represent different windows, the players would know that they are different to the buttons in the setting menu. Pairing the labels with the word settings might help players recognize that there are further settings under them.

Players had issues with understanding the Accessibility label and what that might indicate. Possibly renaming this to something else such as "Assistance Settings" might help players identify where they need to go, but further testing with an updated iteration would be required to confirm.

The last issue that was discovered was that players could not identify the flag in the hole as a wind gauge. It would be possible to change this to a more obvious gauge, but I believe that due to the nature of the test using still pictures, the players did not get the sense of the flag blowing in the wind. Further testing will have to be done during an early software iteration that has a functional flag wind gauge.

Recommendations:

- Change the label Accessibility to Assistance
- Add the word Settings to the Gameplay and Accessibility options
- Change the look of the Gameplay and Accessibility options to tabs in the settings menu

8 Discussion – Accessibility

Being a simulator for a sport that requires most functionality from the player, it is simply not designed to be usable for everyone. *<Detailed discussion of the accessibility implications of the simulator for different people and players – should show understanding of the space and accessibility needs.>*

9 Prototype

This iteration of the prototype is very similar to the previous in terms of player interface design. Based on the results from the player testing there has been an overall approval of the design as well as success in terms of usability. The main issue that the Players had come across was the settings menu, the testers had trouble deciphering that game-play and accessibility were two different sections that needed to be selected. In the revised prototype I had redesigned those two options into tabs, to show the player that they are two different windows that options are under.

The players also didn't like the name of accessibility, they found it confusing and not clear what was in it. I had changed the name of that tab to assistance to give the players a better idea of what to expect.

I also added the word Settings to Game-play and Assistance to further demonstrate that they have more settings within the page under their tabs.

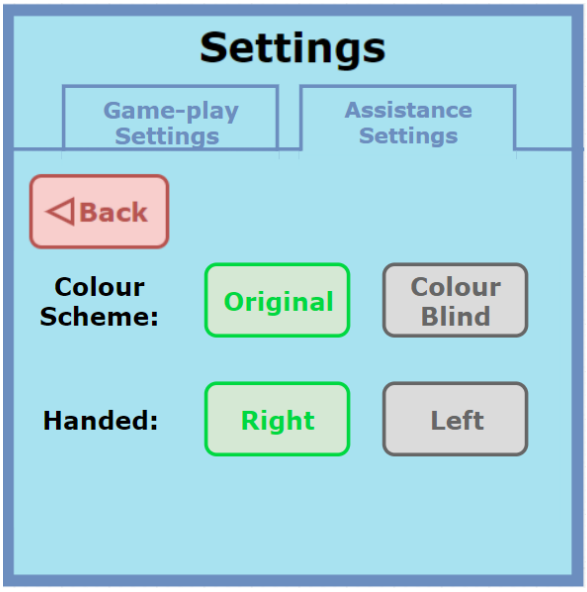


Figure 9.1: Assistance Settings

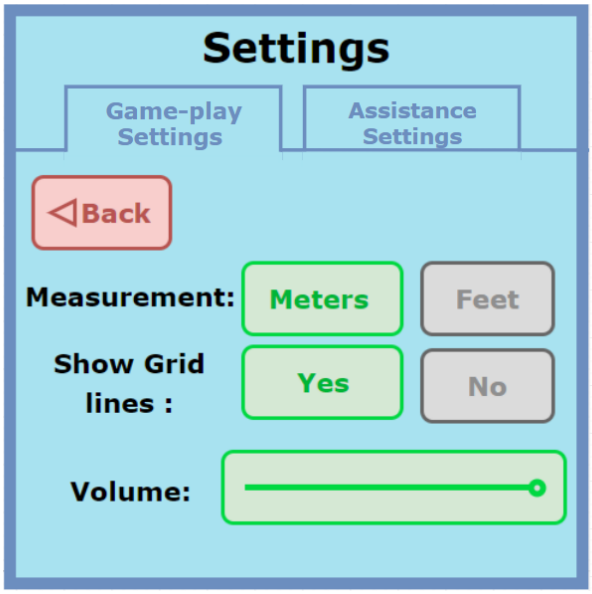


Figure 9.2: Game-Play Settings

The putting simulation has had some changes from the last prototype as well. This simulation shows off some of the features that have been discussed earlier but is now shown off from a first person prospective from within the VR simulation.

Figure 9.3 shows the player standing on the green ready to make a putt for the hole. The rendering shows the features that will be implemented in the product such as the grid lines that show contours and slopes of the green for easier readability and understanding of the hole. The aim assist line the player will use to help guide the ball the correct direction to the hole. The power meter on the left side of the screen that will show the player how hard they hit the ball for betting understanding of the correct amount for next time. As well as a distance of how far away the hole is from the ball for better spatial awareness. And the last feature that is visible from this screen is the Flag to represent the wind currently effecting the green and the players putting.

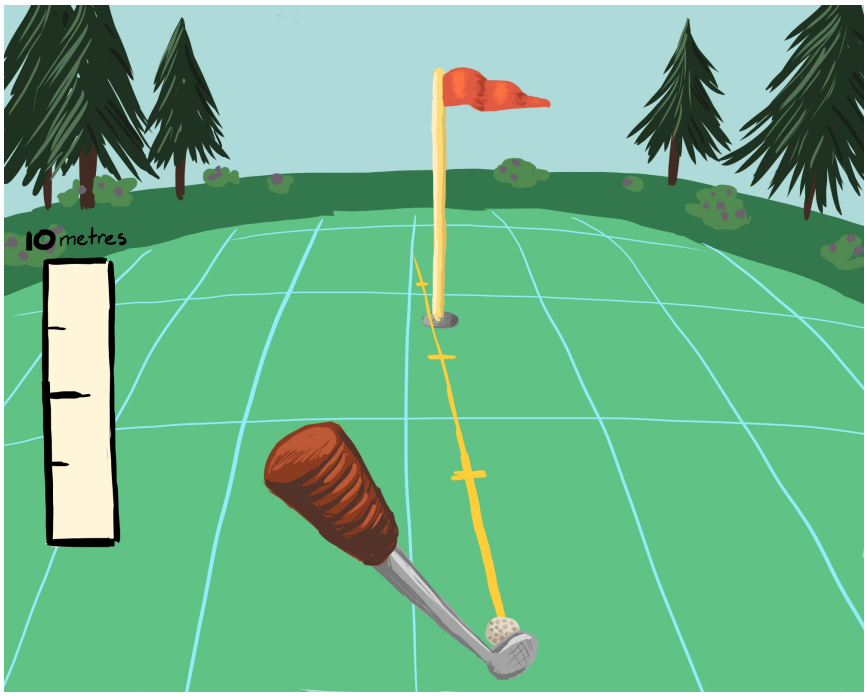


Figure 9.3: Putting simulation

10 Discussion – Contexts of Use

The project so far has been purely designed for <*specific technology and why it was chosen*>. But with this in mind it would not be hard to enable support for <*alternative technology*>.

<*Discussion of different use contexts relevant for this simulator, such as use in the home or at a Golf Club. Discussion of other uses for the simulator – perhaps revisions to suit different sports, or use as a therapy tool for people recovering from injury*>.

11 Discussion – Emerging Technology

The use of Holograms to be incorporated into the system would be a big step forward with emerging technology. The Brisbane based company Euclideon created Holoverse, which is a Hologram Centre that exhibits many different holographic experiences.

<*Discussion of how emerging technologies could be applied to the development of a putting simulator*>

12 Appendix A: Early sketches

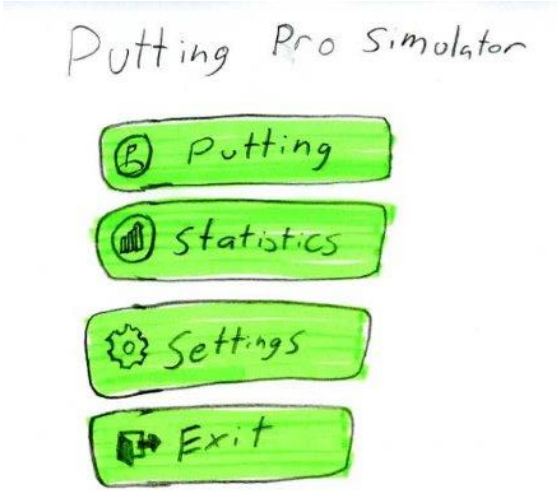


Figure 7.1: Main Menu

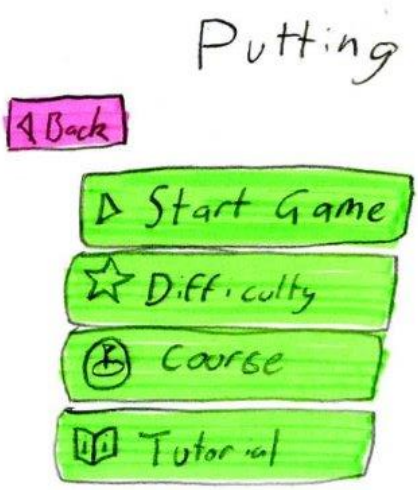


Figure 7.2: Putting Menu

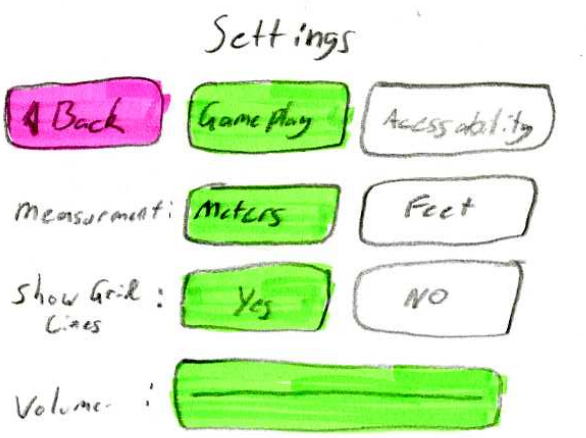


Figure 7.3: Gameplay Setting Menu

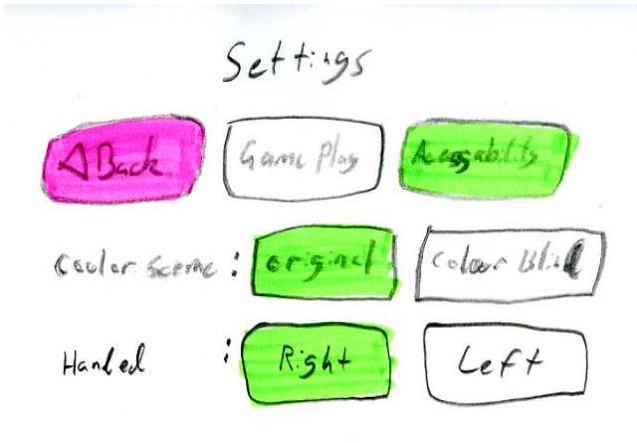


Figure 7.4: Accessibility Setting Menu

Figure 7.5: Measurement

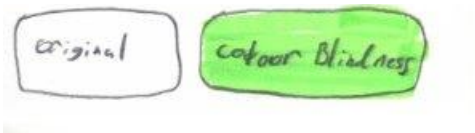


Figure 7.5: Colour Scheme

Figure 7.6: Grid lines

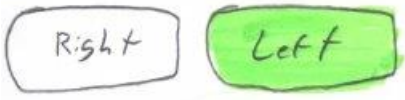


Figure 7.7: Handed

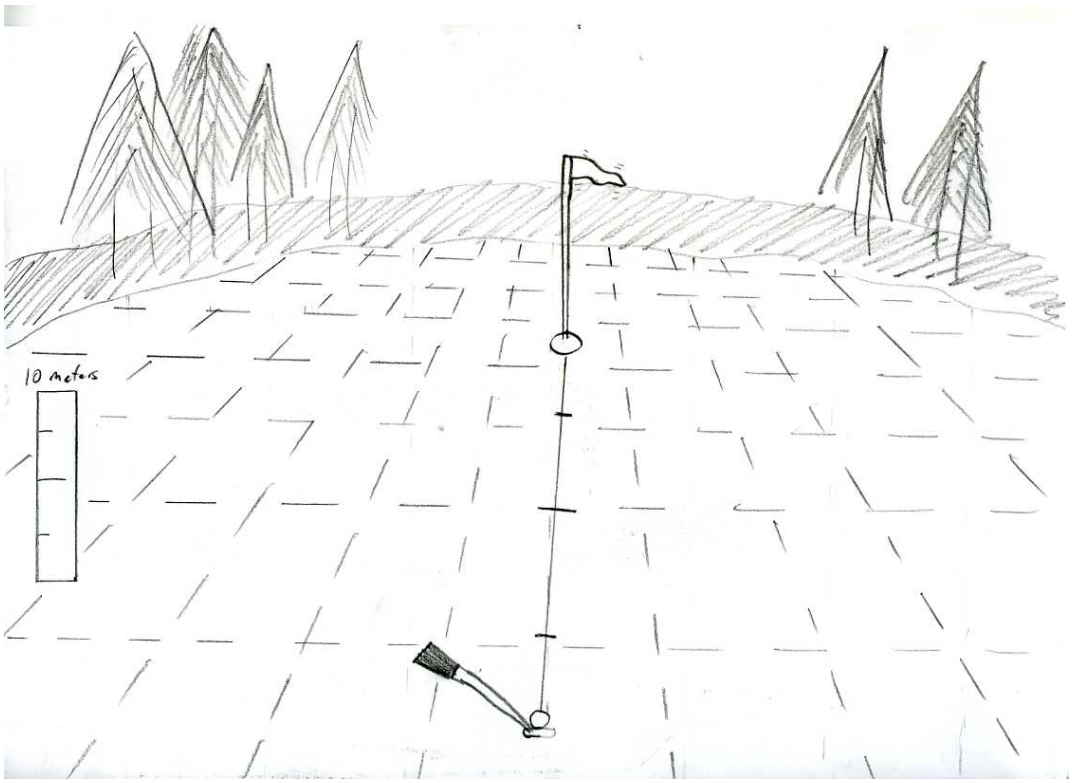


Figure 7.8: Putting Simulation

13 Appendix B: Usability consent forms

Include copies of the completed forms

14 Appendix C: Testing Surveys

Include copies of your completed surveys

15 Bibliography

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