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Team 44

USER

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University of
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Part III

User Manual

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1 Introduction

1.1 What is the game?

Retread is an amusement park themed game centred around the use of the *Motus VR Treadmill* to play the game and aid in the recovery of lower limbs. In this collection of mini-games you will navigate haunted mazes, collect prized coins, test your reactions and traverse treacherous terrains on a unicycle!?

1.2 Who is it for?

This game is designed with rehabilitation in mind for those with injuries to their lower limbs. However, this game is accessible to anyone and everyone regardless of physical ability.

1.3 What's the goal?

The primary goal of this game is to help mitigate the tedious and chore-like nature of rehabilitation through a fun, engaging and thrilling experience that will leave you coming back for more. The game aims not only to aid lower limb recovery patients, but to provide an entertaining video game for any and all users.

2 Hardware Setup

2.1 Required equipment

To play this game you will need:

- A *Meta Quest 2 VR Headset and Controllers* (Figure 40).
 - **What comes in the box?**
 1. The Meta Quest Headset
 2. A set of Meta Quest hand controllers
 - **What does it all do?**
 - * The Meta Quest Headset will place you in the driver's seat of your character in the Virtual World, allowing you to look around as if you were truly there yourself!
 - * The Meta Quest Controllers allow you to interact with the world in different ways



Figure 40: Meta Quest 2 VR Headset and Controllers

- A *Motus VR Treadmill* (Figure 41)

- **What comes in the box?**
 1. The *Motus VR Treadmill*
 2. A pair of slip-on overshoes designed for use with the Treadmill
 - **What does it all do?**

- * If the Headset puts you in the driver's seat, then the Treadmill is the pedal to move the car, granting you the ability to move forward!
- * These overshoes allow the treadmill to detect footsteps, seamlessly simulating your steps and walking in-game!



Figure 41: Motus VR Treadmill

2.2 Charging & connectivity

Please ensure your *Meta Quest 2 VR Headset and Controller* has sufficient charge before playing the game. The Headset can be charged using the USB Type C cable provided in box.

2.3 Wearing the headset

To safely use the *Meta Quest 2 VR Headset*:

1. Loosen the strap at the back of the Headset
2. Put the headset over your head
3. Adjust the length of the Upper Strap and the height of the headset until you have a clear view
4. Tighten the strap to secure the headset

2.4 Seating requirements

Please ensure to set up your chair in a location away from walls or objects that may easily be hit or knocked over accidentally. A fixed (non-spinning) chair is recommended for this game. Simply place the *Motus VR Treadmill* in front of the chair, and sit down to get started!

3 Game Controls

Each Meta Quest 2 controller contains the following elements (Figure 42):

- **Joystick** (omnidirectional)
- **Trigger Button** (rear side, index finger)
- **Grip Button** (side handle, middle finger)
- **Face Buttons** (A/B on right, X/Y on left)

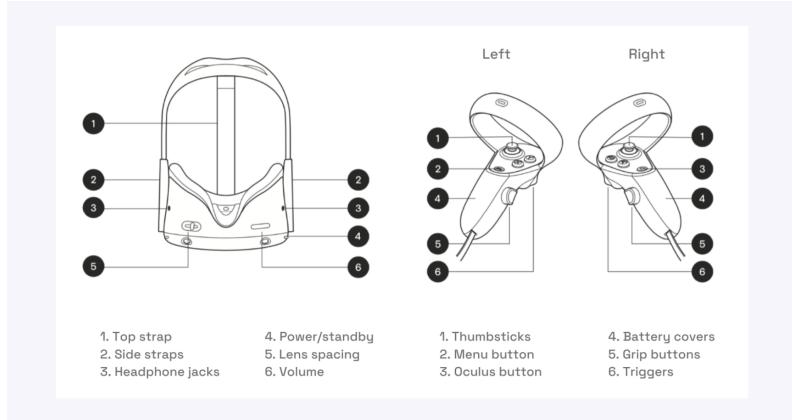


Figure 42: Meta Quest 2 Input Guide

3.1 Forward

To move forward, simply wear the overshoes provided with the *Motus VR Treadmill* and shuffle your feet back and forth on the treadmill!

3.2 Turning

There are 3 different systems for turning/changing direction (note: These systems will automatically be applied depending on what mini-game is being played)

1. Gridlocked Movement (Maze & Chase):

- Your character will only be able to move in **four** directions: North, West, South, East (Forward, Back, Left, Right)
- To change direction, you can use the *left and right controller triggers*, or press the *left grip button* to turn around 180°
- **Helpful Tip:** Try not to move your head too much when these controls are active as too much head movement may lead to disorientation and confusion!

2. Head-Following Movement (Red Light, Green Light):

- As you walk, your character will follow the direction that you are facing
- Simply **look** where you'd like to move and start walking. To change direction while walking, **just look!**

3. Unicycle-Based Movement (Unicycle):

- Have you ever ridden a unicycle? If the answer is yes then this control system will be just like riding a bike!
- While walking you can turn by **tilting** your head left or right to 'steer' the unicycle in either direction

4 Navigating the Game

Welcome to the Hub-World!!! (Figure 43)

Heavily inspired by the design of Amusement Parks, this is your central hub of sorts. Navigate to your games from here!



Figure 43: The Hub-World

4.1 Main menu overview

At any point, you are able to press the *Y button* on the left controller to open up a menu (Figure 44). From this menu you will be able to perform a number of actions that change depending on where you are in the game.



Figure 44: Main Menu

To select an option on the menu just point one (but not both!) of your controllers at the option and press the trigger button of the controller!

4.2 Selecting A Game

The Hub-World uses the **GridLocked** system of movement (for more information on movement systems, please read *Section 3.2*).

As you explore the Hub-World you will find blue portals around the place (Figure 45). These portals will take you to the mini-games!



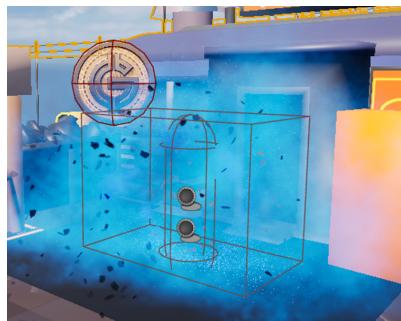
Figure 45: A portal to a mini-game

Next to each portal is a character or model that helps indicate which game the portal is for:

- Chase Game - Zombie Chaser (Figure 46a)
- Maze Game - A Coin (Figure 46b)
- Red Light, Green Light - Zombie Watcher (Figure 46c)
- Unicycle Game - A Unicycle (Figure 46d)

Once you have chosen a mini-game to play, simply enter the portal to be transported to the game of your choice!

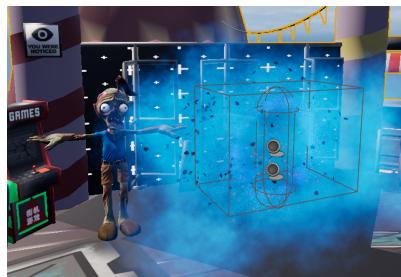
Alternatively you may use the *Main Menu* to select your mini-game!



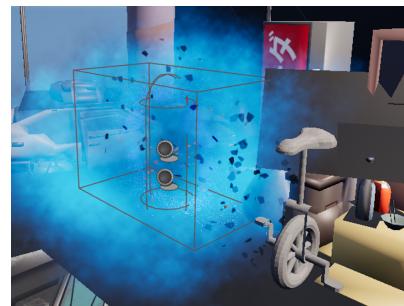
(a) Chase Portal



(b) Maze Portal



(c) Red Light Green Light Portal



(d) Unicycle Portal

Figure 46: MiniGame Portals

4.3 Difficulty selection

To select a difficulty, please use the *Main Menu* from within the mini-game and navigate to your desired difficulty.

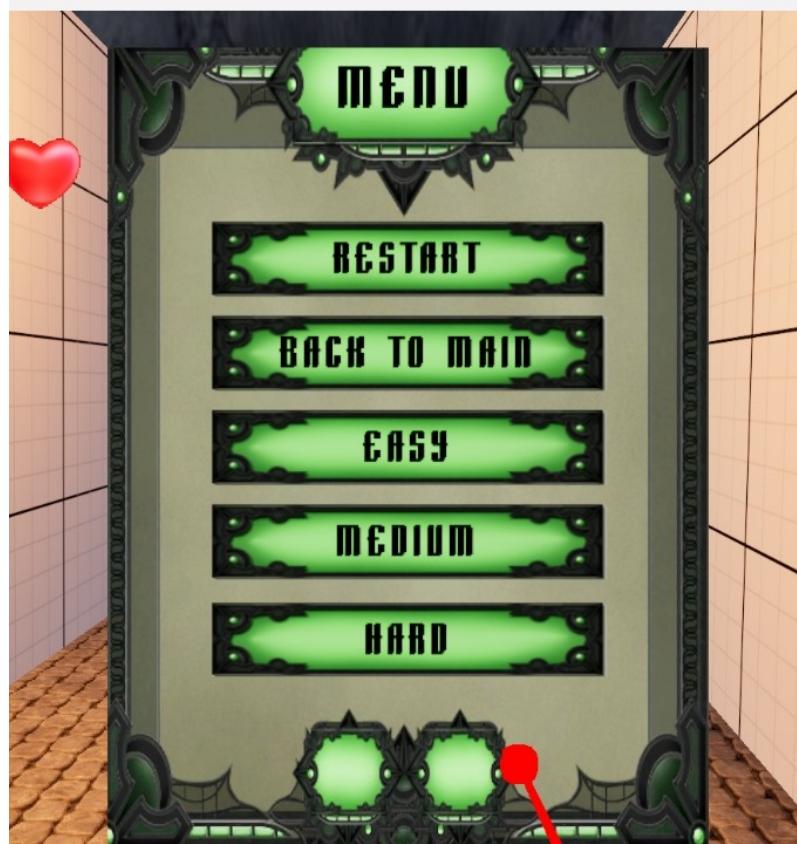


Figure 47: Difficulty Selection from within a game

5 Mini-Games Instructions

5.1 Maze Game

Images from Maze and Chase Games will be displayed below both sections in Figure 49

5.1.1 Overview

In this game, you will find yourself trapped within a maze with one goal... **escape!!!** Be careful though... ***You are not alone***

5.1.2 How To Play

This game uses the **GridLocked** system of movement (for more information on movement systems, please read *Section 3.2*).

With aid of a map, you must navigate the maze to find the key to the exit. Once you have collected the key you can carefully make your way to the exit where you will have completed the game as you successfully escape! There will be Zombies chasing you as you explore the maze. Be sure to avoid them, you don't want to be attacked!

Detailed controls will be shown below in Figure 48

Objectives:

- Navigate the maze (Figure 49a)
- Find the key (Figure 49c)
- Find the exit

- Escape!
- Avoid the hunting zombies (Figure 49d) throughout the process

Win Conditions:

- Reach the exit with the key in possession

Lose Conditions:

- Zombies take your final *life* (Figure 49e)

Helpful Tip: Try not to move your head too much while navigating the maze as too much head movement may lead to disorientation and confusion!

5.1.3 Difficulty Levels

This game offers three difficulty levels, please select one based on physical capability/familiarity with the game:

- **Easy:** 3 Lives, 1.2x movement speed
- **Medium:** 2 Lives, 1.0x movement speed
- **Hard:** 1 Life, 0.8x movement speed

5.1.4 Exercise Intensity

This game is recommended for users with an at least moderate level of control over their lower limbs as the chasing aspect of the game may demand quick reflexes and movement.

5.2 Chase Game

5.2.1 Overview

In this game, you will find yourself trapped within a maze with one goal... **Collect all the Coins!!!** Be careful though... **You are not alone**

5.2.2 How To Play

This game uses the **GridLocked** system of movement (for more information on movement systems, please read *Section 3.2*)

With aid of a map, you must navigate the maze to find and collect every coin available. Throughout your travels you may also find helpful items to pick up! There will be Zombies chasing you as you explore the maze. Be sure to avoid them, you don't want to be attacked!

Detailed controls will be shown below in Figure 48

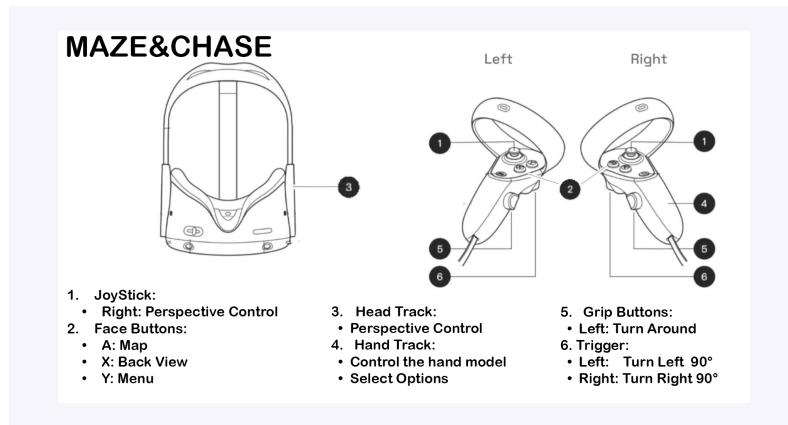


Figure 48: Control Mapping for Maze & Chasing Game

Objectives:

- Navigate the maze (Figure 49b)
- Find and collect coins (Figure 49c)
- Pick up extra lives (Figure 49f)
- Avoid the hunting zombies (Figure 49d) throughout the process

Win Conditions:

- Collect every coin

Lose Conditions:

- Zombies take your final *life* (Figure 49e)

Helpful Tip: Try not to move your head too much while navigating the maze as too much head movement may lead to disorientation and confusion!

5.2.3 Difficulty Levels

This game offers three difficulty levels, please select one based on physical capability/familiarity with the game:

- **Easy:** 3 Lives, 1.2x movement speed, 50 Coins to win
- **Medium:** 2 Lives, 1.0x movement speed, 100 Coins to win
- **Hard:** 1 Life, 0.8x movement speed, 150 Coins to win

5.2.4 Exercise Intensity

This game is recommended for users with an at least moderate level of control over their lower limbs as the chasing aspect of the game may demand quick reflexes and movement.

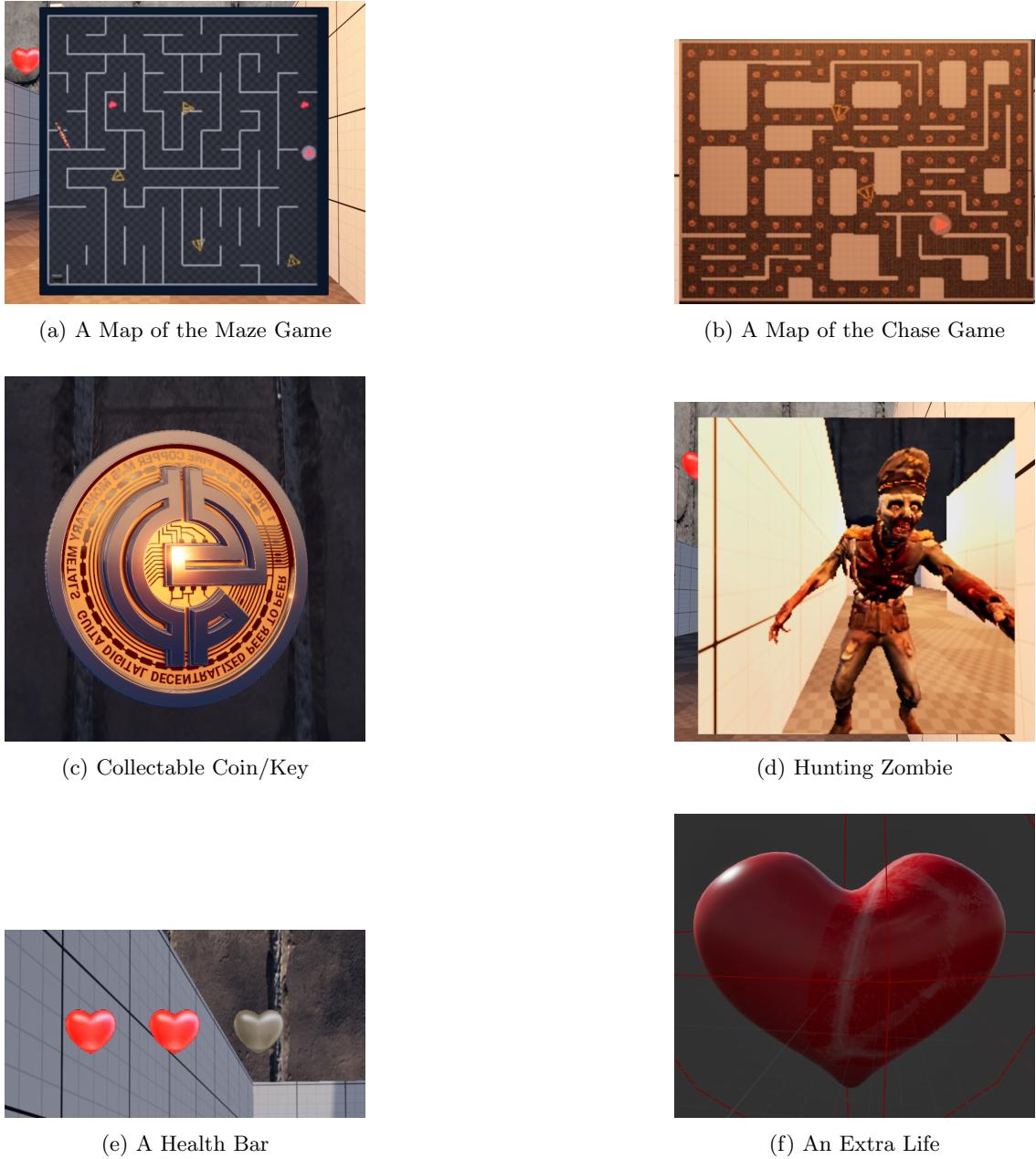


Figure 49: Images from Maze and Chase game

5.3 Red light Green light Game

5.3.1 Overview

In this game, you will find yourself facing a... Giant Zombie???? Looks like he'll attack you if you don't follow his orders.

5.3.2 How To Play

This game uses the **Head-Following** system of movement (for more information on movement systems, please read *Section 3.2*).

You must make your way forward, ensuring that you do not aggravate the Zombie as you do so. The end goal? Cross the **finish line** (Figure 50a) next to the Zombie.

The Zombie can only attack you when it is facing you, that is to say do whatever you want while it's looking away! (moving forward hopefully) When the Zombie turns around you must fulfil one of two conditions depending on what the Zombie does:

1. Attack Left/Right:

- The floor that will be affected by the Attack will light up **red** (Figure 50b).
- Make sure you're not standing on the red when it swings!

2. Jump:

- The floor will light up **blue** (Figure 50c) to indicate this attack.
- Stay still while the Zombie jumps to survive!

If you have not fulfilled the condition required to progress, the Zombie will attack you leading to your death...



Figure 50: Red Light Green Light conditions

Detailed controls will be shown below in Figure 51

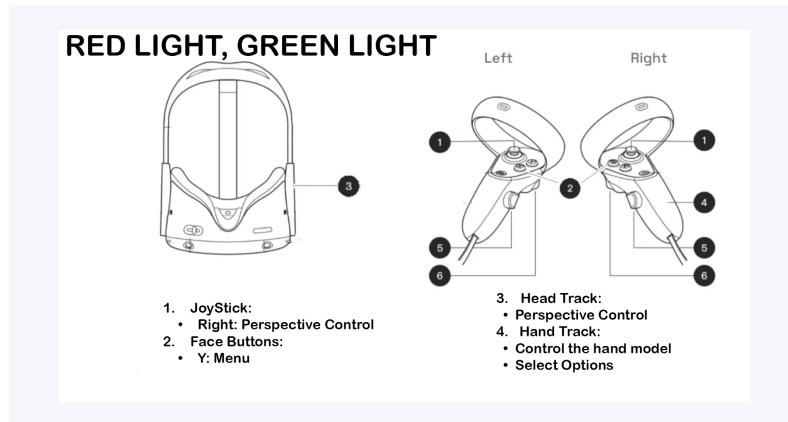


Figure 51: Control Mapping for Red Light, Green Light Game

Objectives:

- Move forward while the Zombie (Figure 52) is looking away
- Get across the finish line
- Obey the Zombie's conditions when it turns around!

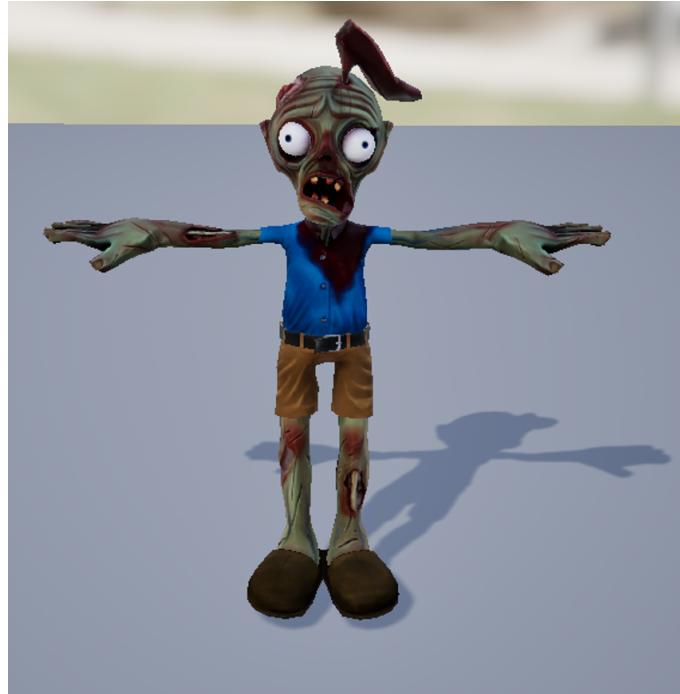


Figure 52: The Zombie Watcher

Win Conditions:

- Reach the Finish Line without being attacked

Lose Conditions:

- Failing to fulfil the Zombie's condition, leading to death

5.3.3 Difficulty Levels

This game offers three difficulty levels, please select one based on physical capability/familiarity with the game:

- **Easy:** 1.2x movement speed
- **Medium:** 1.0x movement speed
- **Hard:** 0.8x movement speed

5.3.4 Exercise Intensity

This game is recommended for any and all users! The low physical barrier of entry allows for anyone to play this game regardless of rehabilitation stage.

5.4 Unicycle Game

5.4.1 Overview

In this game, you will find yourself in a cave. Try your best to follow the path and collect as many coins as you can on the way!

5.4.2 How To Play

This game uses the **Unicycle-Based** system of movement (for more information on movement systems, please read *Section 3.2*).

Welcome to our endless game! In this game you will progress through the cave trying to escape a chaser, following the twists and turns of the paths, collecting coins, squeezing through tight gaps, balancing over planks, and going over boost pads for a quick boost in speed!

Detailed controls will be shown below in Figure 53

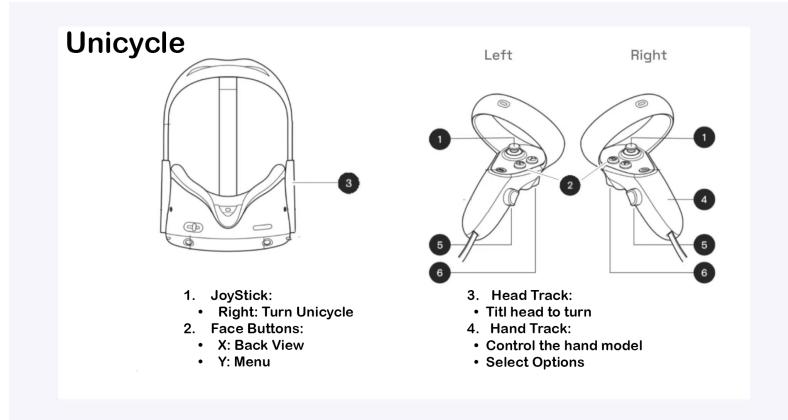


Figure 53: Control Mapping for Unicycle Game

Objectives:

- Move forward and progress through the cave (Figure 54)
- Collect coins
- Squeeze through tight gaps (Figure 55a)
- Boost up hills (Figure 55b)
- Balance over a plank (Figure 55c)
- Try not to go too slow to avoid being caught by the chaser



Figure 54: A Snapshot of the Game Environment

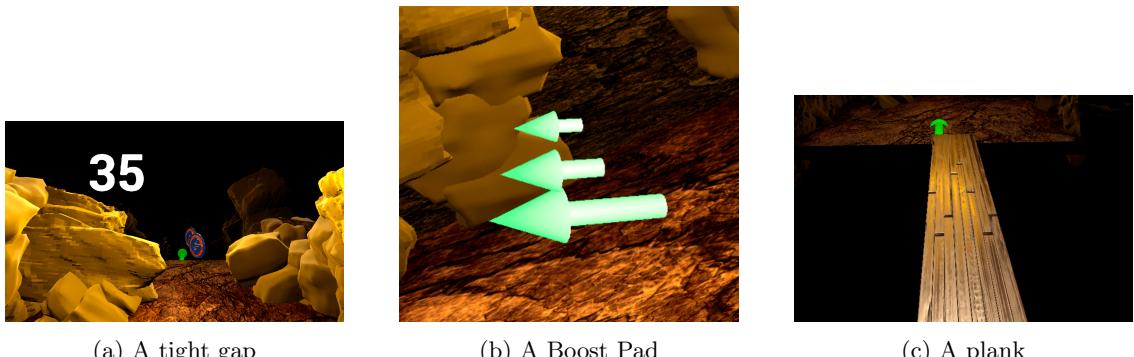


Figure 55: Unicycle Game assets

Win Conditions:

- N/A

Lose Conditions:

- Being caught by the chaser
- Falling off the plank

5.4.3 Difficulty Levels

This game starts easy and progressively becomes more and more difficult as you (and the chaser) speed up as the game goes on!

5.4.4 Exercise Intensity

This game is recommended for any and all users! The low physical barrier of entry allows for anyone to play this game regardless of rehabilitation stage.

6 Safety and Comfort

- Take regular breaks of around 10-15 minutes every 30 minutes to avoid eye strain.
- If you are at risk of seizures and epilepsy, are currently pregnant, need an implanted medical device, or suffer from any emotional distress, consult a doctor for further advice.
- If you do not experience any of these symptoms yet and are still concerned, you should also consult a doctor for advice.
- It is recommended for newer users to play in shorter intervals at a time and gradually increase exposure to VR to build resistance to motion sickness.
- Remain seated at all times and ensure that the headset, controllers, and overshoes are securely attached to you during gaming sessions.
- If you are under the influence of alcohol or substance abuse, please refrain from playing the game.
- Adjust the difficulty of the games to your comfort. Do not try to overexert yourself if you are playing the game for rehabilitation.
- This game should be played indoors in a safe and controlled environment with sufficient space for arm movement.

- Be weary of any wires or other similar hanging objects that may cause tripping.
- Do not operate any machinery or partake in any physically strenuous activities that may have serious consequences.
- Remember that all objects seen in VR are merely virtual and do not reflect reality
- We are not liable for any deliberate misuse or violation of the recommended safety uses.

7 Contact & Support

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