



Design Document

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Introduction

High Concept

Castle SilVR is a virtual reality game in which the player can help Tiny Terry, a thief, plunder through Ingrum Castle, the most majestic castle of the richest King known to man, King Christoph IV, also known as Christoph the Magnificent. Help Tiny Terry traverse through the castle and collect all the treasure without being caught by the guards. The player can control furniture and decorations to assist Tiny Terry solve puzzles and traverse the fantasy like Ingrum Castle. The player has to avoid guards and solve various puzzles in order to win. The player has audio queues and HUD elements that guide them through the castle and help them in navigating around.

Overview

Castle SilVR is an stealth/puzzle game based in a fantasy land where the player has a godlike magical presence. The player is Tiny Terry's guardian and needs to assist him in plundering Christoph the Magnificent's lavish castle. The player can move walls, furniture and wall decorations to guide Tiny Terry through Ingrum Castle and to help him not get caught by the Knights of Halgar and thrown in Deep Huskk Prison.

Tiny Terry has to collect a certain amount of treasure before he can pillage the next floor and get out of the castle with his loot. The player can move around the world to get a better view of the Castle and to solve the intricate puzzles that lay waiting for the player in Ingrum Castle. The player also has the ability to move the level up or down to get a better angle. The player earns points by collecting treasure. The player only gets one chance to steal the treasure and make it out alive.

Background

The player has control over two characters: Tiny Terry and Big Terry. Tiny Terry is a cunning thief who is able to sneak around highly guarded areas without being detected with the help of Big Terry. Big Terry is a god-like entity that controls Tiny Terry. Big Terry can see the whole world so he helps Tiny Terry sneak around. Tiny Terry has successfully raided multiple castles and stole from many nobels so Ingrum Castle is on high alert so Tiny and Big Terry will have to be very careful while stealing.

Features

Game Flow

Players start facing a tower that overlooks them, on the tower three banners hang with the words for each menu option. "Start" "Credits" and "Exit". Aiming and releasing the controllers trigger on Start will start the game and bring players to the tutorial level.

The tutorial levels teaches players the different mechanics of the game, players will interact with objects and lead Tiny Terry through each room, overcoming whatever obstacle is within each room of the tutorial. At the end players will get a Gem and be able to leave through the edit, bringing them to level 1. However, if players are caught by one of the guards the play area will go red and the player will not be able to interact with anything. Just outside of the normal play area an island not unlike the main menu tower island will appear, with options to restart or go back to the main menu. "Restart" will reload the current level and give players another shot, "Main Menu" will of course bring them back to the main menu.

Once player have beaten the tutorial they must solve the puzzles in the rooms of level 1 by doing what they learned in the tutorial in order to avoid guards and gather gems. Players can gather only a few gems, enough to unlock the exit door, or get all the gems on each level. Once players have gone through both level 1 and 2 successfully they are presented with the win tower, topped with a giant Gem.

Controls

Tiny Terry Movement

The small player is moved using the thumbstick on the left controller. This is the standard movement stick. Because the game is in VR and the point of view can change, the movement of Tiny Terry is affected by the location of the headset. When the joystick is pushed upwards, Tiny Terry will always move away from the headset.

Perspective Movement

The game takes full advantage of VR to enable the player to walk in space to get a different view of the level. As the player moves around, the camera moves in the scene. This change corresponds on all three axes, allowing the player to not only walk around, but also crouch down to get a closer view of the level.

Hand Movement

The player must manipulate objects to help Tiny Terry through the levels. This is done using the player's own hands. The controllers track the player's hands in the VR space and move their in-game hands in a corresponding manner. The player's in-game hands must overlap objects to interact with them.

Object Interaction

The VR hands must overlap an interactable object in order to manipulate that object. Each object type has a corresponding highlight color, that tells the player what interaction to expect. Either hand can be used to interact with objects. Once a hand overlaps and object the trigger on that hand begins the interaction. For moving and sliding objects, holding the trigger down enables the object to be moved along with the player's hands. For other interactable objects, pulling the trigger completes the interaction.

Changing Level Height

The height of the entire level can be changed at will. Using only the right controller, when the grip button is held down, the player's hand turns into an

island to indicate the change in mode. While in island mode, if the player raises or lowers their right hand, the level moves at the same rate.

Menu Interaction

The menu state is caused by certain in-game actions like getting caught. While in the menu state, pressing the trigger creates a ray that shoots of the hand with the held trigger. This ray is to be aimed at the menu. Releasing the trigger activates the highlighted menu option

Mechanics

Gems

Players must lead Tiny Terry to “steal” aka collect gems throughout each level in order to proceed. Players must collect 3 gems in order to unlock the exit on a level, although each level has more than that for perfectionists. Gems are noted with a highlight when near the users hands, as well as a sparkle particle effect that comes off them at all times. The number of gems collected is noted over the exit, and a door icon will pop up when the required number has been collected. Gems are a collision based object, where only Tiny terry is required to run into it in order to interact with it. Gems are noted by a **blue** interaction highlight;

Moveable Objects

Moveable objects are a type of interactable object that players can pick up and move freely around the map. Movable objects are noted by a **green** highlight when the users hands are close enough to interact. Moveable objects will stop Tiny Terry from proceeding through the level but will not stop Guards. If moveable objects are tossed off the world they will respawn onto the map.

Sliding Objects

Sliding objects are a type of interactable object, very like moveable objects, but can only be moved on certain axis. Currently all sliding objects only move on one axis in our levels, but are designed to work on multiple if the need be. Sliding objects are noted by a **yellow** interaction highlight.

Hiding Spots

Hiding spots are one of the interactables that require Tiny Terry to be nearby to use. Hiding spots allow tiny terry to disappear in a puff of smoke into the hiding spot to avoid being seen by guards, however while hiding tiny terry cannot move. Like all tiny terry required interactables, the hiding spot needs tiny terry to be in close proximity (read: right next to) the interactable and then players must use their hands to actually interact with it, these types of interactables have a lil person icon overhead to signify that tiny terry is close enough to interact. Hiding spots are noted by a **purple** highlight.

Distractions

Distractions are a collision based mechanic, so they are set off by only Tiny terry running into them. Distractions, once set off, will attract certain guards to them and keep them there indefinitely. This allows Tiny Terry to clear out guards that may be blocking his way. Distractions are noted by a **grey** interaction highlight.

Doors & Keys

Doors and Keys are a Tiny Terry required interactable that are unique in the regard that they are pairs. Tiny Terry will come upon doors with a “Lock” icon over them that he cannot open, however after collecting the matching key players can use them to unlock the corresponding door and continue on. Doors and Keys are noted by a **Red** interaction highlight.

Guards

Guards are are mindless AI that patrol on paths throughout the levels. Each guard has their own path, and a vision cone. Guards will follow their path and if Tiny Terry falls within their vision cone he will be caught and players will get a “Game Over”, and have to restart the level. Guards are ghostly beings and will not be stopped by putting objects in their way.

Tiny Terry

Tiny Terry is the thief which players are helping through each level, a lil guy with spiky red hair. Tiny Terry has to be close to some objects for players to interact with them, and others Tiny Terry can run through to interact. Tiny

Terry can only move around and cannot pass through objects. To help players keep track of where he is, he has a red highlight and after some time a sim like diamond icon will appear over his head.

Hands

Players will use their “hands” (just spheres in game) to interact with objects and menus. Interactable objects will highlight with different colours when a hand is close enough to interact. Players can interact with two objects simultaneously (one for each hand).

For menus players hand will switch from grabbing mode to ray mode, where lines will come off the hands so players may interact with menus from a distance.

Audio

SFX

Players would get audio feedback with every action. Sound was added for when Tiny Terry would walk, pick up items, hide in hiding spots or interact with the distractions as well as when Big Terry would pick up or slide slide objects, open doors or interact with the menu.

Audio files were modified to fit the action. They needed to be short and to the point, especially since Tiny Terry and Big Terry can interact with things simultaneously so the players weren't overwhelmed with too much feedback at the same time.

Music

The main menu and levels have their own background music. For the each level we tried to make the music sound more urgent to highlight the increased difficulty.

Appropriate audio files were selected as per the theme of the game. The intent was to give the vibe to players that they were sneaking around the Castle and upto some mischief since Big Terry is helping Tiny Terry steals items and avoid guards.

Level Design

Workflow

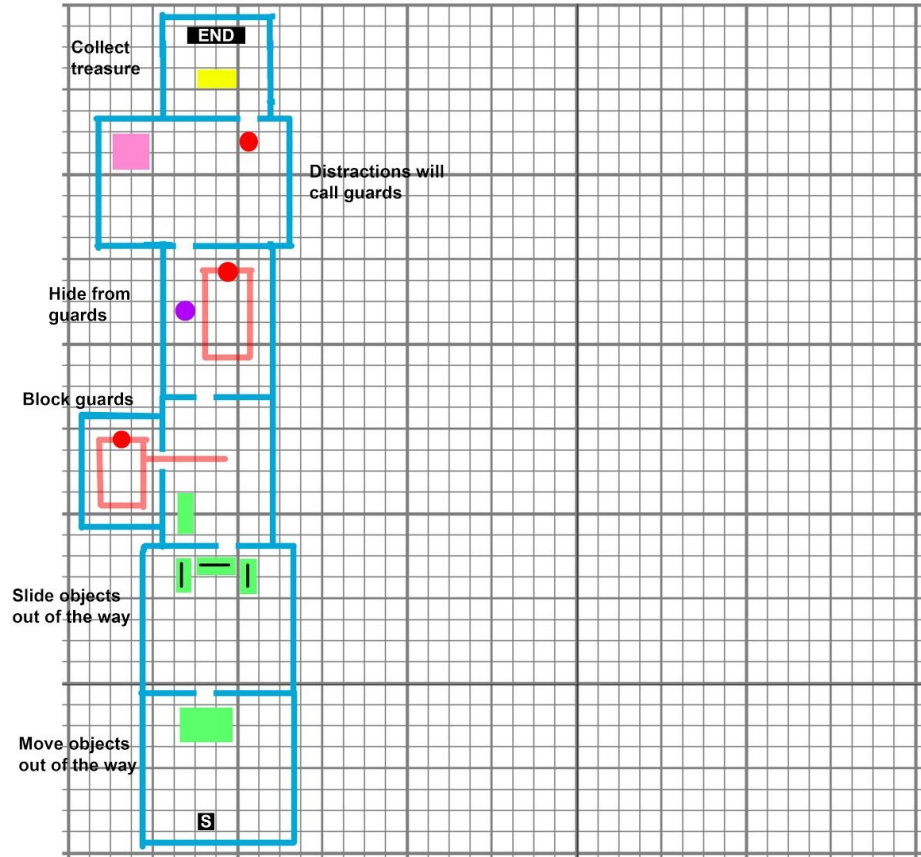
Each level was designed to incorporate the mechanics being introduced to the player within that level. The initial level layout drawings detailed what objects needed to be in the level, and was then given to the artists to make the first graybox. After testing the graybox with some of the mechanics, the needed changes were determined and the layout drawings were updated to reflect those changes. The artists then used the final layout drawings to put the final level together with the correct models. Finally, the correct scripts and animations were applied to the final level in Unity.

Layout Drawings

The layout drawings show the objects in each level to-scale on a grid. The key identifies each object, and the puzzle descriptions give a brief explanation of how each section is solved using the game mechanics. Some mechanics and puzzles were changed for the final version as some features were cut.

Tutorial Level

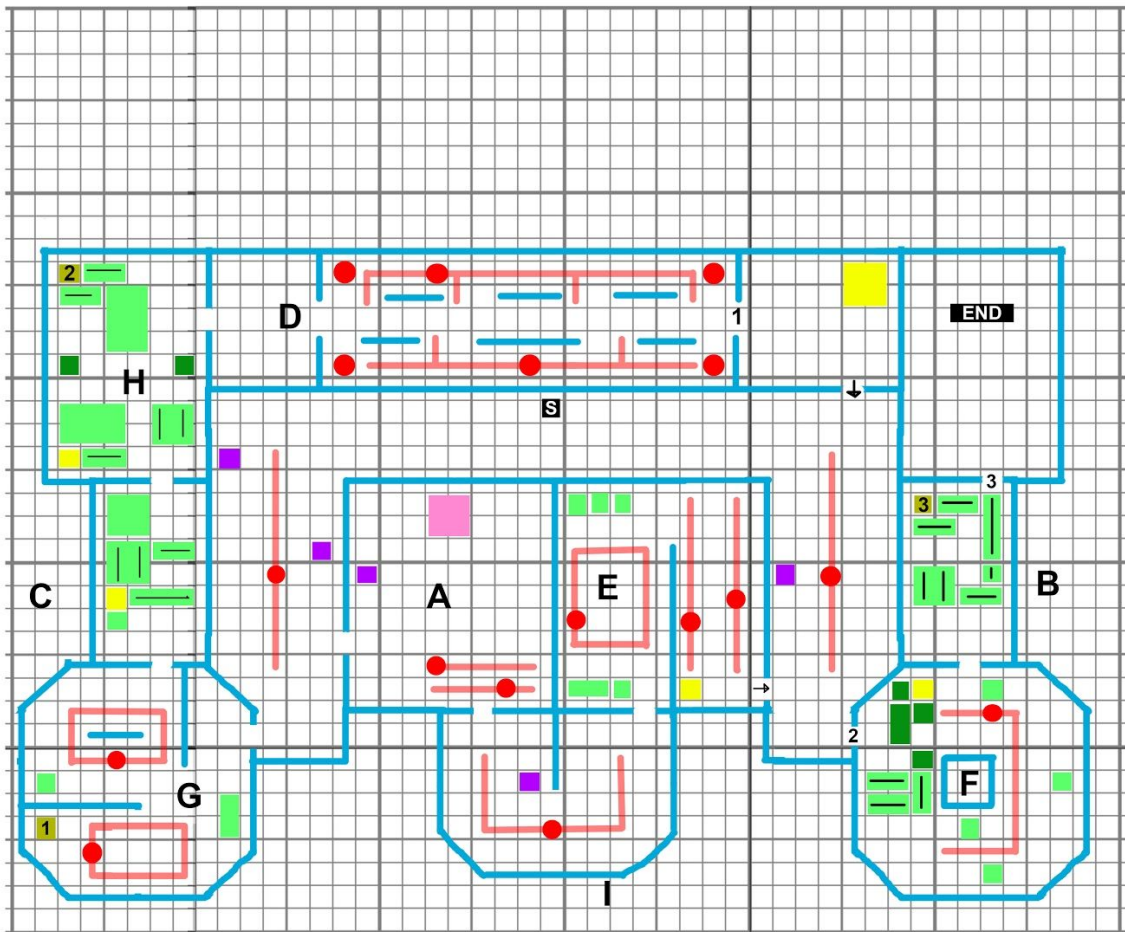
Level Design Draft, 50x50 grid



- | | |
|-----------------------|--------------------|
| Start | Collectible |
| End | Moveable furniture |
| Wall | Non-moveable f. |
| Door | Key |
| Bookcase | Locked door w/ key |
| Bookcase turning area | Trigger items |
| Guard | Player traps |
| Guard patrol path | |
| Distraction | |
| Suit of armor | |

Level 2

Level Design Draft, 50x50 grid



- S** Start
- END** End
- Wall
- Door
- Bookcase
- Bookcase turning area
- Guard
- Guard patrol path
- Distraction
- Suit of armor
- Collectible
- Moveable furniture
- Non-moveable f.
- Key
- 1 Locked door w/ key
- Trigger items
- Player trap
- T= triggered object
- t = trigger key
- L = locked (other specified key)
- Arrow = exit only

- Puzzles:
- A - Find correct keys by color & match them to the pedestal
 - B - Furniture have colored triggers in them, place right table on top banner and rug to unlock door
 - C - slide puzzle
 - D - turn bookcases and avoid guard to move past
 - E - Trigger dust to shorten view of enemies
 - F - Trigger dust, find correct key to unlock door
 - G - Wait for guard to walk by bookcase then flip it and grab key, avoid traps
 - H - Slide puzzle, activate door trigger w/ trigger item
 - I - Hide in armor, sneak by guard

User Interface

The user interface instead of being stuck to the camera is integrated to the world itself since that works better in a VR game and makes for better user engagement. Also, having a screen overlay HUD crowds the player's cone of vision and makes the experience less freeform and engaging. Over the head HUD icons are used to give clues to the player in the level.

Main Menu

The main menu is an island floating in space where the player gets to move around and raycast and interact with the menu that is being displayed on a guard tower. This island is consistent for the in-game HUD and the win screen. This gives the player a glimpse into what the world will look like and allows them to freely move around in a virtual world



HUD

The game has a minimal HUD consisting of mostly icons to show the player where to go and guide the player through and create clear player interactions. The game also has a HUD island that shows up when the player dies that lets the player exit the level or restart.



The exit door has silhouettes of the gems that can be picked up in a level. When a player picks up a gem the silhouette fills up to indicate that the player has completed a task.

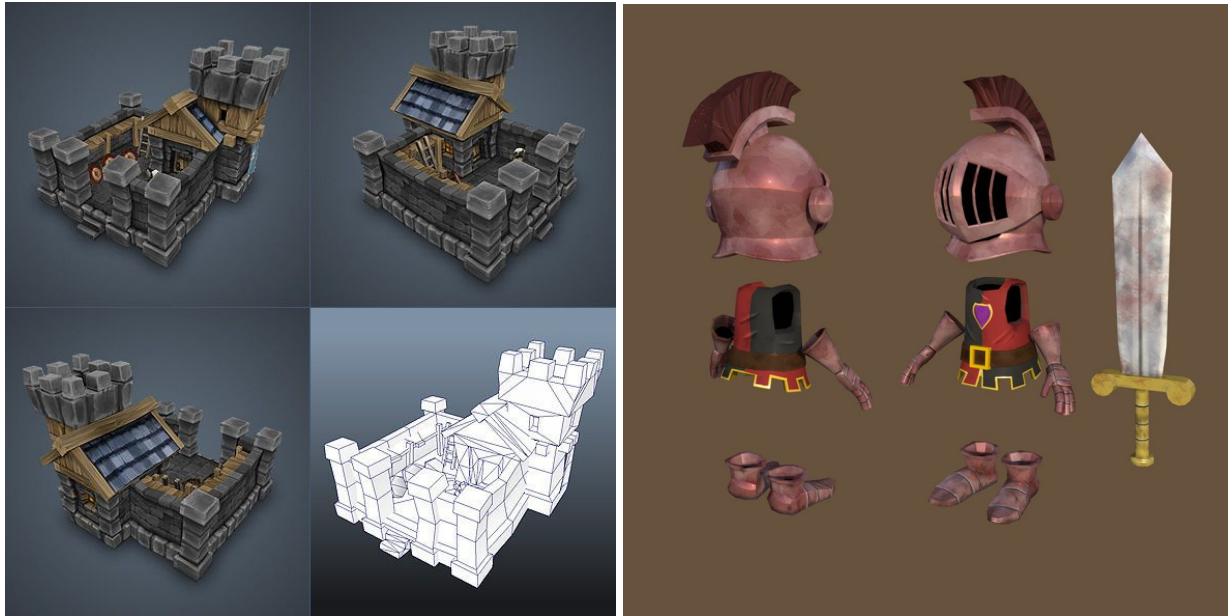


When a player dies, the level becomes non interactable and this island pops up in a distance (so the transition isn't jarring) from here the player can restart or go back to the main menu.

Art Style

Inspiration

Considering the time, members, and skills we have, the best choice of art style is low poly and cartoonish representation of everything in the game. Images below are samples of our inspiration references.



Style Overview

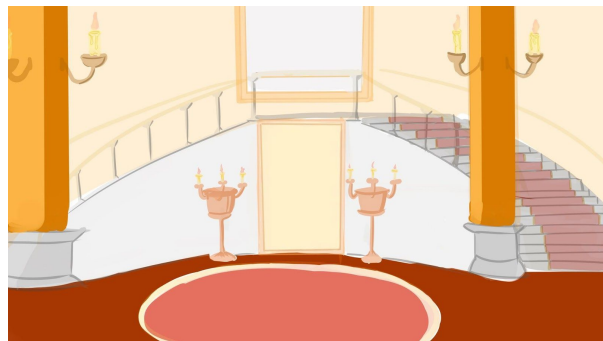
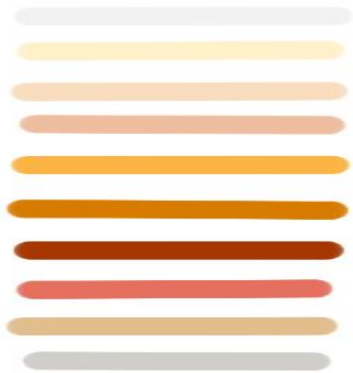
The original idea was going towards a colder colour palette, for creating the stretch and pressure atmosphere since it is a stealth game. However, later on while we were working on concept arts, it seems like the warmer and darker colour palette are the preferred idea for most of the members. Images below are samples of concept arts and color palette. Both characters and environments were following the concepts style below, so we can get a consistent overall style of the game.



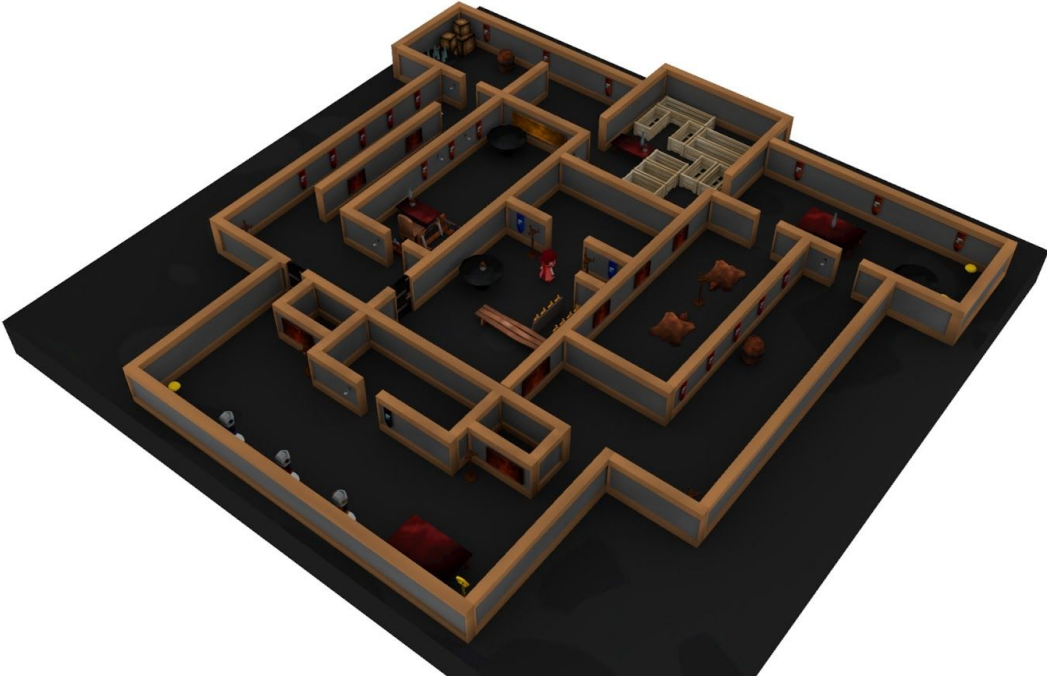
First Character design

Character design came out to be these little character arts we narrowed it down to about 2 of them. The guy in red leather.

Reason is because one is because the design is easy to make, the other reason is it fits the roguish characteristic nature.



Model Renders





Appendices

Schedule

- Week 5 - thursday (feb 15th)
 - Project setup
 - Unity Project
 - VR confirmed working
 - Programing Architecture - singletons
 - Game Manager
 - Sound manager
 - Menu Manager
 - Hud Manager
 - Grid Manager - Needs to be working
 - Level Manager
 - Input Manager - Needs to be working/ Movement
 - Proof of concept
 - Small maze

- Base Movement system
 - Base obj interaction (Grid)
- Week 7
 - Maze
 - Additional level(s)
 - More fleshed out original level - Models + Playtest changes
 - Base baddies
 - Path following/ finding
 - Wandering and Seeking
 - Cone of vision
 - Level switching mechanic
 - More obj interaction types
 - Base UI
 - Main menu
 - Pausing
 - End state
 - Win state
 - Lose state
- Week 9
 - Baddies
 - Alert state
 - Controls
 - Fleshed out
 - Polished
 - End State
 - Win and lose more defined
 - Sound
 - Most sounds
 - UI
 - More fleshed out main menu
 - Submenus in pause
 - HUD
 - Object interactions
 - More fleshed out
 - Polish
 - Even more?
- Week 11 - FEATURE FREEZE
 - Polish
 - Maze defined
 - UI complete
 - Object Interactions complete
 - Level switching complete
 - Sounds in game

- Week 14
 - POLISH
 - POLISH
 - STABLE AF BUILD FOR IMAGINE RIT
- Week 15
 - Final Build
 - Final Documentation

Interface Flow

- Main Menu
 - Start
 - Credits
 - Exit
- Game Over
 - Main Menu
 - Restart
- Win Screen
 - Main Menu

Team

- **Development Team**
 - Satch Puri
 - Project Manager
 - UI
 - Joel Shuart
 - Programming Lead
 - Noah Bock
 - Programming
 - Erin McAnany
 - Level Design
 - Programming
 - Varun Mhatre
 - Dev tools
 - Programming
- **Art Team**
 - Kevin Li
 - Art Lead
 - Binyu Sun
 - Wanqi Zhang

- Zhangliang Wei

Technology and Licenses

Team Communication

- Trello
 - Task management
- Slack
 - Non-in person communication
- Weekly Dev meetings (tuesdays)
- Weekly whole team meetings (fridays)

Hardware

Windows Mixed Reality Headset

Software

Unity 2017.3.1f1

Maya 2018