Computer Science and Engineering
University of Nevada, Reno
CT Games
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Abstract

By: Austin Turner

In today's virtual reality market, especially the mobile one, has been becoming filled with great applications. However, there are few that allow mobile users to play with each other. Even fewer fully incorporate the body's movement within the game itself. The goal of CT Games is to deliver a completely immersive, multiplayer experience to users in the mobile application marketplace. Through the inclusion of the VR step plugin, we can expect that the inclusion of the whole body in the application gives it a competitive advantage. Also, incorporating a networked application hosted on the cloud and using Unity's built in networking plugins, our application will be able to deliver multiplayer to users either in a LAN or in a WAN setting.

Introduction

By: Austin Turner

Ct Games presents the Curse of the Glitchataur, a Virtual Reality mobile application for users in the Android and iOS marketplaces. A common shortfall of current Virtual Reality applications is their lack of immersion and networked connectivity that the more expensive Virtual Reality models, such as the Oculus Rift, offer due to their heightened capabilities. Most applications in the mobile Virtual Reality marketplace are constrained to simple operations such as moving over a bridge, or exploring space, but lack the connection with other players and full-body movement that really brings the user into the experience. Immersion is achieved through the use of the VR-Step plugin for unity. VR-Step is a unity plugin that allows virtual locomotion through sensing walking in place. The translation of walking in the real world is translated to the virtual environment as real walking is approximated well. VR-Step provides a more simple and immersive experience without any external, bulky equipment. It only relies on the smartphone's inertial sensors to pick up on real-time pedometry. VR-Step also reduces the chances of motion sickness. It creates a hands-free experience and users can still stay in place.

CT Games presentation of its application the Curse of the Glitchataur aims to deliver a product that has been so far lacking in the mobile Virtual Reality Market. We offer the full-body immersion of the user through the VR step and the inter-connectivity that Unity offers as a plugin. From our last submission, we have decided to take a step back on the actual game play of the application and focus on getting the bare functionality of the game. This came as a suggestion from Dr. Folmer when we met with him to discuss our progress in development. As a professor in game theory, he felt that our game play was lacking in balance and may need us to try different concepts before focusing on anything too specific. Some very basic ideas we have come up with include; cooperating together to achieve some goal where each player has a special ability to help everyone get through, a maze running game where you pick up powerups to trip-up your opponents, and a stealth game where the goal of three players is to sneak

past one player with extra abilities. Nothing is set in stone yet, but just some basic ideas we can try as we're building the game.

As a group, we have decided upon a few goals to complete before the start of next semester. First, we need to have at least the very bare-bones of the application completed. This includes; a working repository hosted on github and a workflow established, a bare and open map with little focus on looks, the ability to load a player into the map and be able to look and move around, and as a bonus, we'd like to have the networking aspect of the game built in. The last part of our goals is a little ambitious, but if everything moves forward nicely in the development process over the break, it should be doable.

Prototype Objectives

By: Mitchell Reyes

The objectives we hope to achieve with the prototype development is that we are able to get two players in VR. When the two players are able to connect to each other, they are able to move with the VR-step technology and perform simple game tasks, such as picking up a key or exiting through a door. Once we are able to connect players in our game and we have the elementary movements functioning, we will be able to implement game aesthetics.

The main objective the team has with prototype development is to clearly outline the gameplay. Throughout creation of the specification document and design document the team has bounced between various gameplay concepts. Initially, the team wanted to do a pacman clone, but this drastically changed and now the gameplay concept does not really resemble pacman. The prototype snapshots should show the stages of a game all the way to the end. The plan for prototype development is to show every aspect of the game and receive feedback so that future game development may go smoother.

Prototype Functionality

By: Mitchell Reyes

Intro

Because the prototype objective is to show the game from start to finish, the intro screen was included along with a prompt for the user to input a username.

Lobby

This shows the status of other games in the area, which includes showing the number of players in each game. A user may also create their own game and wait for players to

join.

Movement
Our team decided to prototype the movement of a player. Since the main component to our game is the VR-step, the movement has to be compliant to the VR-step technology. Once we know that players are able to move as a basic functionality, we will be able to add the aesthetic features.

Picking Up A Key
Having players reach an objective is the main premise of our game. We want our players to be able to get to their key and pick the key up if it matches the player's color.

Deaths
Removing objects from the map will clear any unused memory from the device the player is playing on. When players die, the key that they picked up must be removed from the game, creating a smooth transition to the end game stats.

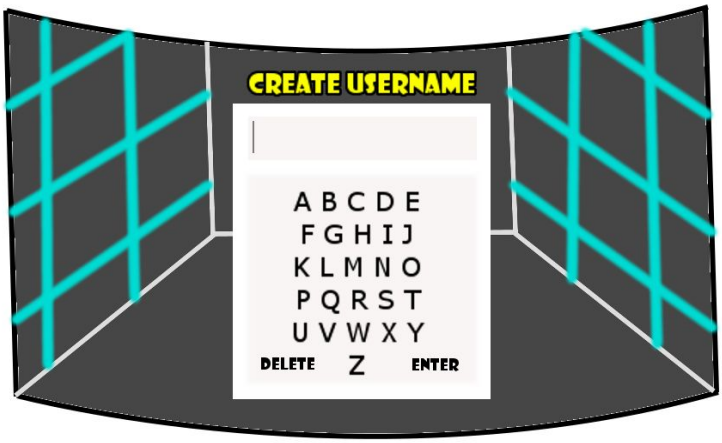
Win conditions
The win conditions consists of: time expiration, all players die, all players escape, or all players do not escape. Our game needs to have an end point, so prototyping the win conditions will give us a versatile test environment.

The features we decided not to prototype are walls, items, mini-map. the randomization of roles, multiplayer, settings, and the end-game stats. These features are not crucial to our initial testing and cannot be developed until the base functionality is completed.

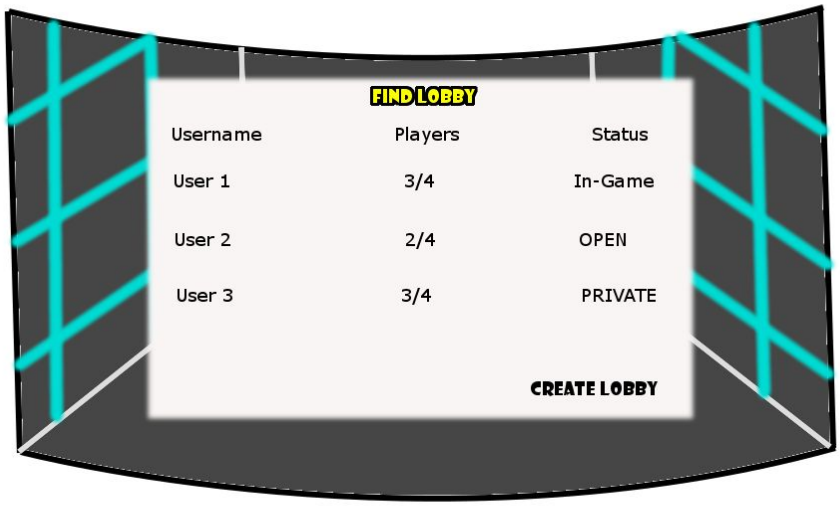
Develop Prototype

By: Mitchell Reyes

Intro



Lobby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Players
Status
User 1
3/4
In-Game
User 2
2/4
OPEN
User 3
3/4
PRIVATE
CREATE LOBBY


LOBBY
Players:
Ready:
PLAYER
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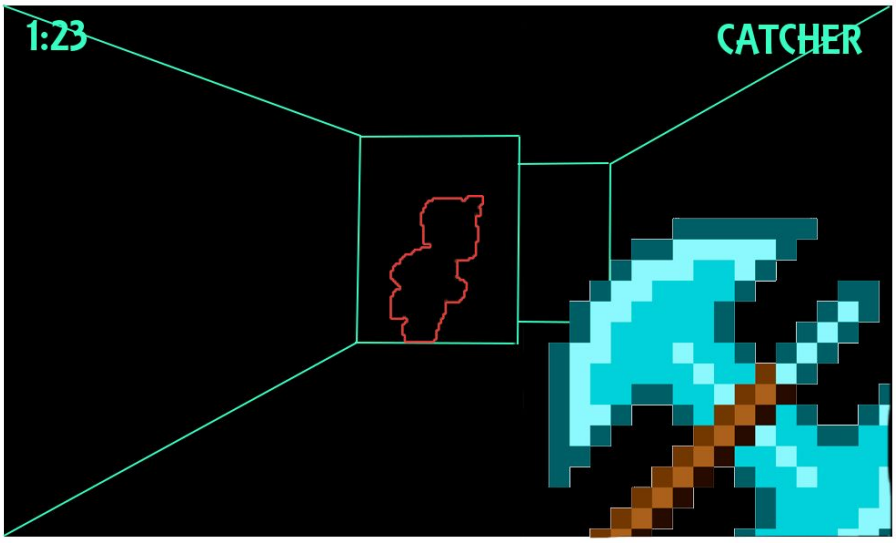
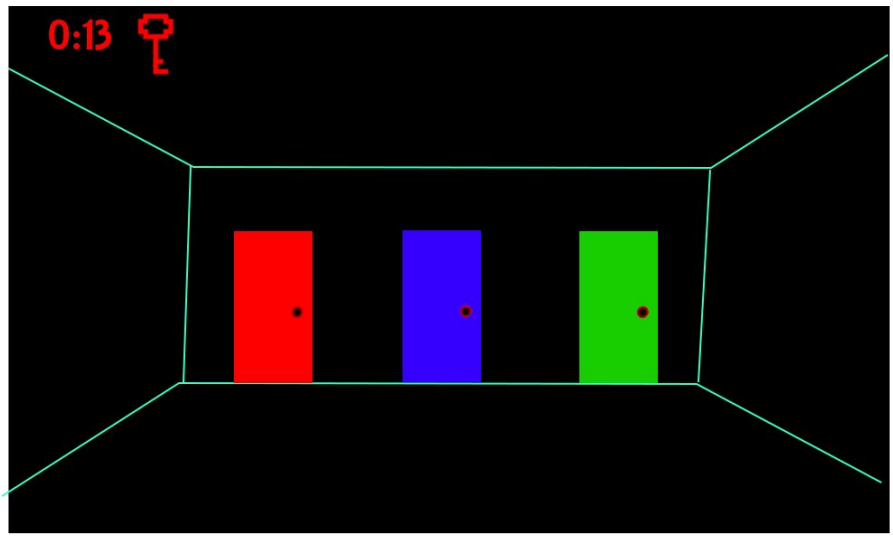
QUIT
SETTINGS
READY UP

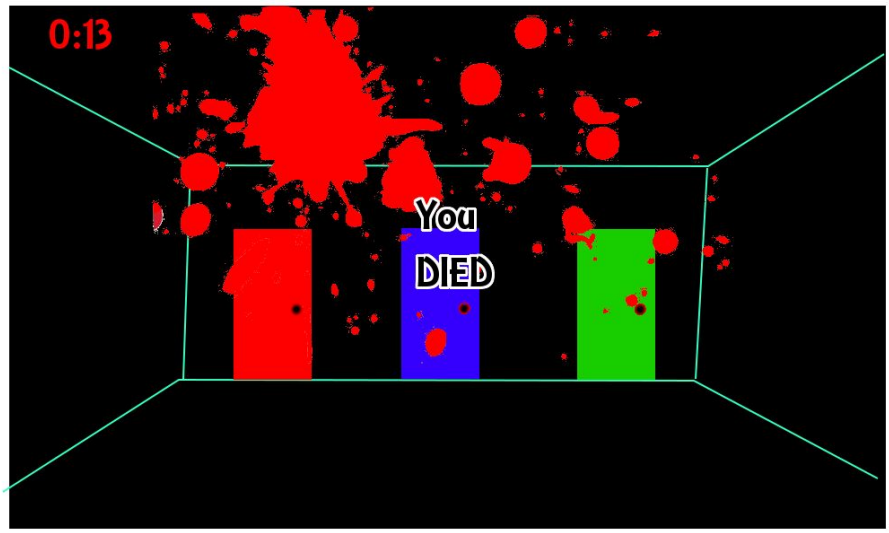
Movement



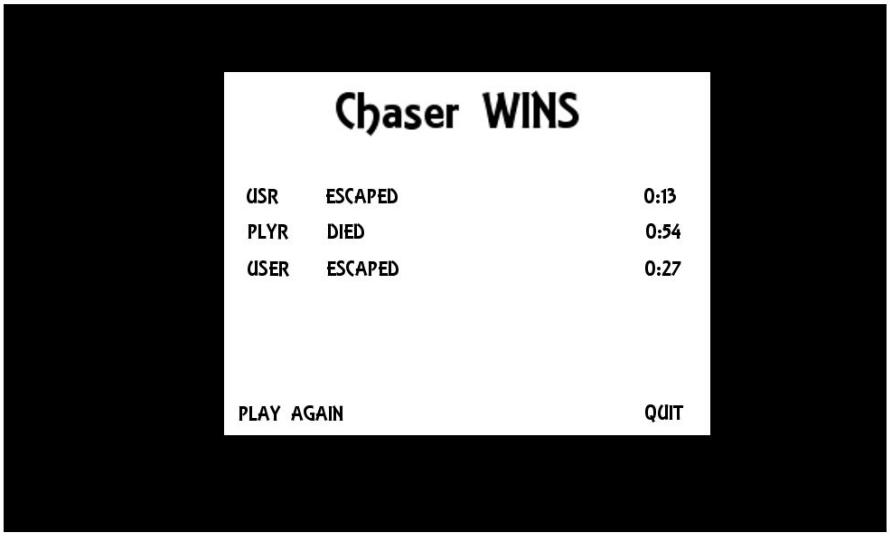
Picking Up a Key



Deaths



Win Conditions



Evaluate Prototype

By: Erika Manning and Helen Medrano

Stakeholder: Eelke Folmer.
Dr. Folmer is a professor that is very familiar with Unity and game development. He is also the advisor for this project.

Feedback: The graphics should be simple, which was seen in some of the prototype snapshots presented, and it should also be consistent. The team discussed making the game look pixelated. This would be easy to render and the simplicity allows for optimum amount of frames per second so that the user experience is smooth. The method to collect user input was also discussed, since this becomes tricky in virtual reality. Tracking eye gaze is usually the way to go, although this may be slow. It was suggested to shorten the amount of user input needed; for example, usernames could be limited to only three letters. Instead of eye gaze, a keyboard may be displayed on the ground and the user may walk to desired letters. For the start menu, a user could just walk through some doors instead of having to press a button. Some VR headsets do not come with buttons and we would like the game to be as accessible as possible. As previously mentioned, the gameplay lacks balance. A few new concepts were discussed during the team meeting. A few suggestions for gameplay were the following: increased cooperation between players where each player has a different special ability (hearing, sight, strength), allowing players to leave time sensitive trails behind such as footprints, include power-ups in the game that can be stolen by other players, or making the "chaser" especially powerful sometimes in order to create a greater balance since there are 3 "seekers". It was also mentioned that once development begins, a lot may change in terms of what the team feels can be done. The team was advised to especially focus on the multiplayer and networking aspect of the game as he has not seen this in other games. He suggested looking into a way to do peer to peer connections. It was suggested that over the winter break, the team should strive towards creating a running prototype where 2 players can walk around the same maze. Afterwards, the team may really focus on the gameplay. Dr. Folmer stressed that the team should really strive towards creating an original, and fun game.

Stakeholder: Adam Clapham. A potential user that is interested in virtual reality. Stakeholder has no software development experience.

Feedback: Instead of having one player have to chase down the other three, all players could compete against each other. This would mean allowing them to attack each other. He also liked the idea of players leaving behind a trail. This creates a sort of hunting scenario. Players could try and use their senses to deduce where another player is. This would include following footsteps and listening for a player's movement, which could be something like rustling of leaves. Another idea was to make the players ghosts that leave behind goo trails and change the temperature in a room, which can be

sensed by a visor that may only be used a few times for 3 seconds at a time. The pixelated look was also preferred by this stakeholder. This solidifies the notion that the game does not have to be stunning to be immersive, it just has to be fun and have engaging gameplay. The idea of having temporary powerups was also suggested.

Stakeholder: Alexander Wittmann. A potential user that is interested in virtual reality. Stakeholder has no software development experience. Alex is also an avid fan of games and an experienced gamer.

Feedback:
The minotaur seems disadvantaged. In a three versus one game, the one player has to have some one versus one advantages to level the playing field. The game should incorporate unique powerups for the minotaur and the players. Players could have more defensive power ups, whereas the minotaur could have offensive power ups. An example of a powerup could be the minotaur astral projects and is allowed to walk through walls to find people. Each type of player should have a different role depending on their powers- this would mean that the minotaur would have to be buffed. Multiple floors would add depth to the game. Programmers could add map functionality that would allow transport between floors. This would also increase difficulty for both the players and the minotaur. A secret shop could appear where players could trade in game gold or points for weapons or power ups. This map would only be accessible by the three players. A special room generation would be interesting, with there being only a 1 in 15 chance of the room appearing that round. Getting into the room would mean special privileges or powerups for the players.

Changes Needed to Specification

By: Erika Manning and Helen Medrano

Networking: Implement a peer to peer method for players to connect in the game. The team is considering google cloud and unity networking options.

Graphics: Graphics must be consistent. The game will be pixelated.

Gameplay: All changes that need to be changed for the gameplay specification have to do with making the game more balanced in relation to player abilities and goals. There are four players: one minotaur, and three other players hoping to escape the maze. The one minotaur must have some incentive to chase after the three other players and have a fair chance at catching them. In order to escape the maze the three players must cooperate as they each have different and equally valuable special abilities. For example, one player has super hearing to hear if the minotaur is nearby, another player can freeze the minotaur for a number of seconds with a power cool-down period, and another player can see the minotaur's outline through a wall for a few seconds at a time. Players can switch abilities by bumping into each other. All players have the ability to see the minotaurs trail temporarily, but being close to the trail and the minotaur means

the minotaur has a better chance of hearing them. The minotaur can pick up power ups that can be in the form of strength and speed upgrades, or parts of weapons that can be crafted together. These power ups are temporary so that the minotaur never has too much of an advantage over all the other players. Instead of having three different doors for each player, there will only be one way to escape in order to encourage cooperation among players.

Team Contributions

Erika Manning
Erika contributed to the Evaluate Prototype section and the Changes needed to specification section.

Mitchell Reyes
Mitchell wrote the prototype design and prototype functionality.

Helen Medrano
Helen contributed to the Evaluate Prototype section and the Changes Needed to Specification section.

Austin Turner
Austin wrote the Abstract and Introduction.