



DUCK HUNT REVOLUTION

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INTRODUCTION

We developed a VR game that based on the nostalgic Mega-Son game "Duck Hunt". Our application simulates two different modes. The player's main goal is to win as much points as possible by killing ducks or zombies using one shotgun or two pistols. We added interactive scores and levels to the game so the player can enjoy both the game and the VR experience. The application gives the player an extraordinary experience that enables him to use several senses in order to get a high score.



SYSTEM

We created a game that runs on computer and played with VR gear, targeted specifically for the HTC Vive.

The application was developed using Unity 2018.2.6F1 (64-bit) game engine.

Equipment required

1. HTC-Vive Headset
2. HTC-Vive controller



Some relevant links:

<https://unity.com/>

<https://www.raywenderlich.com/149239/htc-vive-tutorial-unity>



APPLICATION OVERVIEW

The application consists of 3 scenes for the user to Navigate.

1. Garage Menu
2. Classic Play mode
3. Zombie Play Mode

THE GARAGE MENU SCENE

The garage menu scene allows the user to choose the game mode and his weapon of choice. While using the HTC VIVE right controller's trigger, the user can choose the right options for him within the menu.

The modes that are possible to choose from are Classic (swamp) and zombie (grave yard). Each mode looks different than the other and has its own challenges. For example, in the zombie mode the user needs to turn around constantly to see if a zombie is walking towards him and shot it.

The weapon choice allows the user to get different experiences, and the opportunity to use both controllers or just one.

THE CLASSIC PLAY MODE SCENE

In this scene you are in a swamp and beside you is your loyal hunting dog.

When you are ready, the dog runs in a random direction in which ducks are hidden, the dog will bark hard and thus chase away the ducks.

After that, the ducks will fly in the air at a speed that will change as the levels goes up, you must shoot them accurately and gain points that will be based on your hits and the speed with which you hit the targets.

The user can hear a background theme music and hear appropriate noises when a duck is being shot.

During the game, the user can see his score and the level he's in.



ZMOBIE PLAY MODE SCENE

In this scene the user is in a scary cemetery,

Where he's going to come across some scary zombies that are going to crash into you and end your game in a loss.

Your goal is to kill as many of them as possible and before they can reach you.

The zombies can reach you from all directions so you must be prepared and be familiar with your surroundings.

Here, too, you can choose to use a hunting rifle or two pistols to kill your enemy



DEVELOPMENT PROCESS

To accomplish our final application, we used unity 2018. We searched online for ways to make unity work with our equipment, the HTC VIVE headset and controllers. We found VRTK- virtual reality tool kit, a productive VR Toolkit for rapidly building VR solutions in Unity3d.

We searched for environment assets, such as grave yard, swamp, guns, ducks, boxer dog, zombies, trees and flowers

At first, we tried to get simple objects like a box and a ball to move in space.

After we moved them in different directions, we tried to get them to fly in the air to learn how to move the ducks during their flight in the air.

The next step was to start working with the state machines of each object and with the help of indicators to cause one object to react and act on the motion and state of another object, we encountered problems of timing and we had to do a lot of experiments to figure out exactly how to control it and run smoothly.

At this stage we brought the proper assets from the store and started to put together the game.

After we put the environment, the ducks and the dog in the game we used the previous knowledge from the experiments we did in the beginning to make the dog run in the direction the ducks were formed and then make them fly and by an indication of hitting a ball, make them fall to the ground.

Finally the dog returns to the starting point and starts another round.

We had many problems with the whole subject of duck colliding in the ground and many times the ducks simply passed through it and continued to fall forever. The terrain collider needed to be changed. We changed our terrain but the data the collider used was the old one, so we re-mapped it, in addition to change the ducks movement enabling the collider to be detected. Another issue we figured out in that case was that the animation of the ducks waited for the previous animation to end, so we changed it to be interruptible.

In addition, there were many cases in which the dog's run and the flight of the ducks were not synchronized. We solve it using state machine on both ducks and dog, as well as manager script which responsible of sending and receiving messages between them.

Another problem came up when we let other people play the game, they emphasized that it is difficult to understand at first where the dog is.

In order to solve this, we presented an indication of "follow the dog" so it would be clearer where it was.

In addition, we created a pause of a few seconds at the beginning so that the player could find the dog and understand what happens in the game before it starts.

After we finished with the central scene, we set out to build another scene of a



cemetery and zombies, we've had it very simple to create it because we used the same scripts with small adjustments.

Moreover, every new critical element we added to the game – such as new scene, we did group testing – let people that never played before play the game and give us feedback. An example of that is adding “health” indication at the zombie mode after players told us that it's unclear when the game is over.

The menu scene we built during the construction of the main scene and the main challenges were to make the right scene to work when you press the "Start".

Sounds – we want the user to feel like he is in a swamp while he is playing, he will feel like he is totally disconnected from the real world, and that he is living the game. We thought the sounds can attribute to this idea.

SCREEN SHOTS

the menu scene





The classic play mode scene





The zombie play mode scene

