VR SkyFall 3D Game

Han Lin Aung   <hanlaung@stanford.edu>
Juan Manuel Camacho   <jcamach2@stanford.edu>

Introduction

This project is a VR game created using Unity and the Google VR SDK (originally the Google Cardboard SDK). We are building a game in which the player has to jump from one platform to another to reach the destination. However, the caveat is that sometimes, there might be no platform for the player to jump onto. In such times, the player needs to use his/her wits to hit the special-colored blocks which will generate new platforms that will then create a path!

This VR game is based on the Android platform as a means to reach a large number of audience as most people can still not afford a high-end headset. Hence, we used the Google VR SDK which is used for Cardboard-based headset, such as Google Cardboard and the ViewMaster headset.

Many of the current VR games on mobile headsets do not incorporate the use of controllers. However, we are using a Bluetooth controller along with the headset to allow for more interaction with the virtual environment to have a better game experience.

Creation Process
The game is inspired from the concept of an Infinite runner game, such as Temple Run, along side with escape room (puzzle-type) games and Mario. Hence, we combine these concepts to create a game in which the player, in a first person perspective, has to jump from one platform to another, without falling to reach a certain destination with certain paths that will only be activated by shooting certain special blocks. We also added coins where the players may have to jump to collect the coins!

While creating the project, we realize that just using head tracking is quite limiting in terms of our ability to interact with the virtual environment in the game. Instead of just jumping from one platform to another, we also decided to add the interaction of shooting bullets to hit certain special blocks/targets. Hence, we decided to add a Bluetooth controller to control for the movement.

Environment
Below are the components we have in our virtual environment in the game.
In terms of lighting, we use the default lighting (directional).
We added a skybox imported from the asset store to create a better viewing experience when players look off to a far distance.
We use texts to display a certain change in status in the game(such as the end of the game or the completion of the game). In terms of the text display, we use four text components

in our game. One for restarting the game, one for the score, one for the high score, and the final one for the completion of the level or the game.

We also created a terrain, with a texture that mimics a snowy mountainous surrounding that the player would not like to fall onto. Falling from the platform onto the terrain means "Game Over,"

We added coins for the player to collect. The coin is rendered with a texture imported from the Unity asset store, resembling an old Japanese coin, giving a touch of the feeling of history in the game.

We also decided to add sounds into our game to create a more immersive experience. We added sounds for times when the player collects the coins and when the player shoots the bullets.

We also added a laser gun, which is imported from the asset store. For the bullets, we use the particle prefabs, which are pre-configured game objects, which mimic a laser-like texture.

We added special cubes/blocks that incorporates the effects from the particle system that players have to shoot for generation of dynamic platforms.

The final component, the platforms, are the parts where we put in the most effort into, and constitute the major part of our gameplay experience. These are blocks, that has a stone-like texture, in which the player has to jump onto. The blocks have colliders which allow the player to not fall through them. We also have a fade-in/fade-out animation for the blocks. The series of blocks form a path from the start to the destination. While some are stationary blocks, there are also moving blocks that make it all the more challenging for the player to move from one place to another without falling and having to restart the game again!

Gameplay

Regarding the gameplay, the goal of the game is simple: to get to the destination platform/block.

The head tracking is managed by the phone's gyroscope and the processed values can be easily accessed in Unity. The head tracking allows the user/player to move his/her head around to view the virtual environment in 360 degrees.

The player can also jump, move, and shoot bullets using the laser gun. These movements and interactions are managed by the Bluetooth controller (Button A, X, and B respectively). The player needs to shoot bullets at special blocks to have dynamically created blocks that will allow the player to reach the final destination.
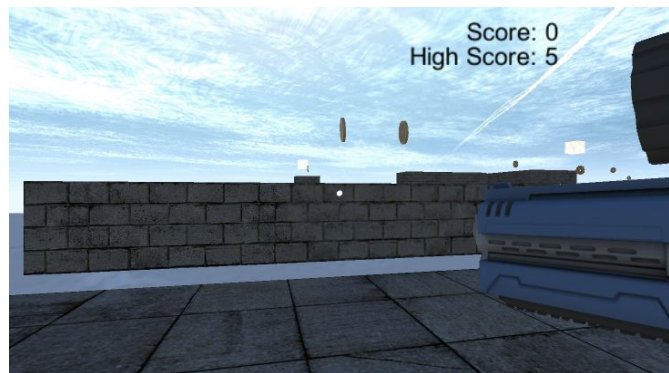
Conclusion

      The overall experience provided by the VR game demo does present the potential and accessibility of a decent virtual gaming environment. While there are some issues with motion sickness that occur after some time with interacting with the virtual environment, the mobile VR experience is very well a great entry point into interacting with more realistic virtual gaming environments.