Introduction

Our course project is to build a Unity game with interactive virtual environment. More specifically, we build a large, beautiful and exciting maze with Unity3D. The player starts at the entrance of the maze, walk around to enjoy the beautiful view, explore the mysteries and most importantly, find a key to the entrance of a temple. With the key possessed, the player can get into the temple behind the maze, where a treasure box is hidden. The first-person player character has a constant walking speed and its walking direction / face orientation can be controlled by IMU mounted on the VR headset, using the orientation tracking from VRduino.

Our orientation tracking code adapts from previous years’ course project of EE267, and the provided reference fruit ninja project. Basically, the VRduino reads measurements from IMU and compute the orientation tracking with sensor fusion method. The tracking results are then fed into Unity3D through USB port. A simple script is written to extract the tracking data and used for controlling the player.

Details of the game

1. The player character has a default walking speed, so that the interaction comes from turning the head around for the orientation. For example, when the player turns his/her head to the left, the character will walk to his/her left. The same rule applies to turning back and right.

2. To create an intriguing game environment, we have a countdown timer that tells the player how much time is left until the game ends. When the time runs out, the player will get notified and the game is over.

3. The player is able to walk in any directions, and the maze is built in the air. Therefore, it is reasonable to have a setting that the game ends as soon as the player walks out of the maze ground and falls into the valley.

4. Hints are provided and shown as the bouncing white balls along the maze paths. When the player walks back to the location where he already had visited before, the bouncing balls will be shimmering with different colors.

5. Other additional features include: the ability of jumping, coin collecting along the path, spatial sound effects under different situations, as well as customized game scenes.
Figure 1 The Maze Overview

Figure 2 The VR view
Related Work

With the development of integration of Unity and VR devices, there are numerous classic popular video games with new VR technology being released. One of the projects by Erick Simões[1] is about the maze, up on which we had our project built. We use some of the prefabs provided in Erick’s project, but the game logic, object interaction and all the VR components are built from scratch.

Timeline

5/26-5/31
- Get familiar with Unity
- Setup game scene and main components of the game

6/1-6/6
- Incorporate with HMD
- Implement additional features

References