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SUBJECT : VIRTUAL REALITY APPLICATION WITH GOOGLE CARDBOARD

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This assignment is about creating Virtual Reality (VR) application with google cardboard. For this assignment, I have

Procedure:

1. Making Google Cardboard, a piece of cardboard had been used, and at first, I had following the tutorial from online to make the lenses, but I found out that the result is not that good. Thus, I get the lenses from Mr. DIY shop.
2. Using Unity Engine to develop a VR scene, the theme is tribe village.
3. Google SDK had been used in order to build a VR apps in phone platform.
4. Different type of assets had been imported to increase the features of the village.
5. To increase the realism, I had applied lighting, so that shadows are formed.
6. Besides, collision detection had been added to the objects, for example, trees, tribe houses, stones, woodfire and so on.
7. Animation had been applied on several assets, for example, woodfire, villagers cutting down trees, walking and chatting, chickens.
8. Resonance Audio SDK had been user to applied 3D spatial sound had been applied to the animation in order to increase the realism and immersion.
9. User movement is by head tracking.

To enable the user move in the VR world, since I did not provide the controller for the users, they only can move by looking down. I had set the look down angle to 10 degree. Once the camera track that the head movement is looking down more that 10 degree, the camera will move forward.

Spatial audio is a full sphere surround-sound technique which imitate the way we hear in real life. This feature is important for VR as it can increase the immersive and impress the user. In my project, 3D spatial audio had been used to locate the sound in 3D space so that the user perceives the sounds as coming from the real physics object in VR world. Google VR SDK have provided audio-rendering engine to optimize the user experience for mobile VR.

Immersive VR means that user is completely immerse inside the virtual world. It refers to the ability of the VR system to make the user believe that the virtual world is the real world. On the other hand, presence is how the user feel engages and think the virtual world they are inside is the real world. Both concepts are similar and necessary for each other to provide a great experience for users.

Motion sickness means that the information received by the user's eyes is not match-up with what the body feels is going on in terms of balance and spatial orientation. Besides, there are some research point out it is more likely to make women feel sick than men, and the reason is due to interpupillary distance (distance between two pupils). This is because most of the default VR headsets are match nicely with man, but not woman. However, gender is not the only factor, age, genetic and sensory conflict must consider as well. To reduce motion sickness, developers have to consider that the game performance must at least 60 FPS, prevent head wobble during the player walking and so on.

Link for project demo: https://youtu.be/56Ch9MWpQj0