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**Introduction**

Virtual reality (VR) technology has gained popularity in recent years for its ability to create an immersive and interactive environment that mimics real-life situations. This technology has been widely used in the entertainment and gaming industries. Additionally, VR has the potential to provide users with health benefits by incorporating physical activity into the gameplay. In this Capstone project, the goal is to develop a VR game that combines entertainment with physical activity to create an engaging and motivating workout experience. The game will allow users to use VR controllers resembling boxing gloves to punch and destroy objects that come towards them. This incorporation of physical movements into gameplay provides an opportunity for users to improve their fitness and muscle strength while having fun. The game will be developed using Unreal Engine 5, and 3D assets will be created using Blender software. This project aims to provide significant health benefits to users and make exercise more convenient and enjoyable.

**Abstract**

This Capstone project aims to develop a VR game that provides an immersive and interactive environment for users. The user will use VR controllers resembling boxing gloves to punch and destroy objects that come towards them. The physical movements required in gameplay will help improve the user's fitness and muscle strength. The game will be developed using Unreal Engine 5, and 3D assets will be created using Blender software. The goal of this project is to create an engaging and motivating workout experience for users. The convenience of VR technology allows users to exercise anywhere and fit exercise into their busy schedules. This project has the potential to provide significant health benefits to users while making exercise more enjoyable. The project will require knowledge of game engines such as Unreal Engine as well as 3D modeling software such as Blender. Music for the game will be sourced either in unreal engine which is free or purchased online.

**Technical Requirements**

There are some hardware and software Requirements for this project. Game engines are responsible for running complex game logic, rendering graphics, and managing physics simulations. All of these tasks require a significant amount of computational resources, including CPU and RAM, so to able develop this Project it require good computer. Another requirement will VR headset (e.g. Oculus) to test game when it done. As Software, I need install unreal engine 5, and 3D modeling and animation software such as Blender.

**Project Plan Include task for 490 class and 491class**

My plan for 490 class is define project goals and requirements, and create project timeline. Since I will create and develop this project, there is zero Budget. Also, I will choose one VR headset to develop my project for it because each platform has its own requirements for uploading games. However, if I have time, I will do for another VR as well. Finally, I will learn Unreal Engine 5 and Blender Software. Since I am not taking summer class, I will also learn Unreal Engine 5 and Blender Software in summer as well, so I won’t have any difficulty when develop this game in next semester. In 491 class, I will create 3D models of game objects using Blender software. For sound, I will use Unreal Engine’s music and sound effect. After I have all assets, I will implement game. Finally, I will do final presentation for capstone project.

**Requirements Design and Modeling**

This game will have the following requirements:

1. The game should be immersive and provide an engaging experience for the user.
2. The game should require physical activity and provide health benefits to the user.
3. The game should be easy to play and navigate, even for users who are new to VR.
4. The game should be compatible with a VR headset and VR controllers resembling boxing gloves.
5. The game should have realistic 3D assets created using Blender software.
6. The game should have sound effects and music to enhance the user experience.
7. The game should be built using Unreal Engine 5.
8. The game should be tested and optimized such as Oculus.
9. The game should be uploaded to distribution platforms such as Oculus Store.
10. The game should be marketed and promoted on social media platforms.

**Metrics**

1. Active users: Measured by the number of users who download and play the game regularly. This metric can be used to track the game's popularity and engagement.
2. Workout effectiveness: Measured by tracking the time user spent playing the game and the number of calories burned during gameplay. This metric can be used to measure the effectiveness of the game in providing a workout experience.
3. User satisfaction: Measured by collecting user feedback through social media or ratings on distribution platforms such as Oculus Store. This metric can be used to improve the game and identify areas for future development.
4. Revenue: Measured by tracking the amount of revenue generated from game sales or in-game ad. This metric can be used to measure the game's profitability and the effectiveness of the marketing and distribution strategies.

**Deployment and Distribution**

Once the game is developed, it needs to be distributed and made available for users. This involves building and packaging the game for different platforms such as Oculus, SteamVR, and Viveport. Each platform has its own requirements and guidelines for uploading games, so it is important to ensure that the game meets these requirements. The game can be uploaded to distribution platforms such as Oculus Store, Steam, and Viveport as well. These platforms provide a way for users to download and purchase the game. I will focus on Oculus, and if have extra time in 491 class, I will do for another platform as well. Marketing and promotion are also important for the success of the game. Social media platforms such as Facebook, Twitter, and Instagram can be used to promote the game and reach potential users. Creating a website for the game is also a good way to provide information about the game and attract potential users.

**Conclusion and Future Work**

In conclusion, the development of a VR game that combines physical activity and entertainment can provide significant health benefits to users while making exercise more convenient and enjoyable. The use of Unreal Engine 5 and Blender software can help create an immersive and interactive environment for users. In future work, the game can be expanded to include more features and levels to keep users engaged and motivated. It can also be adapted to different fitness levels and personalized to the user's fitness goals.