Project Deliverable H: VR SIMULATOR User Manual GNG1103 – Engineering Design

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Section B4, Group B6

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Abstract

This paper is a user manual for the VR Simulator program developed in GNG 1103 Engineering Design. The program is designed to run on Window's OS and be used with the HTC Vive and Oculus Rift. The VR system includes a user friendly interface that allows the client/doctor to easily select a video to play in VR. The program that can play 180 degrees stereoscope footage and additional audio with the built in functionality of play, pause, restart, forward, and rewind. The program also includes a bilingual interface. Accessibility and customization of the program by family/general public is important for the program. After reading this manual there should be no issues using the VR Simulator program.

Introduction

The Ottawa Hospital is looking to provide a VR system for cancer patients. The objective of the program is to create a safe and informative environment for patients for their upcoming medical procedure. The hospital will upload videos to an interface to allow patients to experience their upcoming medical procedure. The client will be able to build simulations to simulate the experiences of the patient's treatments. The usage of this product will reduces anxiety and fear of the actual treatment while ensuring the patient has knowledge about their treatment.

Related Work

The project has been tested with the OCULUS SDK and HTC VIVE. These two headsets are virtual reality (VR) headsets. VR headsets are used to create a "virtual world" where the user is able to view a 360 degree rotatable canvas that is responsive to movements. The project was developed through UNITY (v2019.2.9f1). Unity is a game engine that is used to create VR games with C#. The final program runs through the games launcher STEAM VR and was built for Windows OS.

Start Up

The program can run on the PC even without the headset, just open its' containing folder and run "Proj 1.ex". To run with the headset, make sure the VR headset is plugged into the PC (preferably a powerful one), make sure Steam VR is running and verify that the headset is running. The headset will not show anything until the user enters the "Play" mode. The program will run on the PC and is controllable from there regardless if the headset is running or not. Select either the French or English version of the program on start up, this will navigate you to the Main Menu of your preferred language. Buttons will turn black/grey when hovered over.

Main Menu

At the top of each menu, there is a title that specifies the menu you are currently on. At the bottom of the menu, the currently selected video and audio files are displayed. The default for these two are “ct_scan.mp4” and “N/A” if no audio is selected. The rest of the buttons do the following functionality:

Select Simulation: Brings user to the “Select Simulation” menu, where the user can choose video and audio files to run in the VR video player.

Play: Brings user to the VR video player, which will display on the PC monitor and the VR headset.

Help: Brings user to the “Help” menu, this is where important information and tips on using the program will be displayed.

Exit: Terminates application.

Language: Brings user back to start-up menu, where user can select the language.

Select Simulation Menu

In the “Select Simulation” menu, the user can choose the video files and audio files to play in the VR video player. In the bottom-left of the menu, there is the “Back” button, this button returns to the “Main Menu.”

There are two input fields on this menu, the first—which says “Enter MP4 File Here:”— is for the MP4 video file, any MP4 video file will work here, regardless if it is stereoscopic or not. It is important to note the smaller the video file, the more efficient the performance. The second says “Enter Audio (WAV) File Here:”, this input field is for the audio file. *Important, all audio files need to be a WAV file in order to function. A WAV file recording software (audacity-win-2.3.2.ex) should be in the projects folder.

To properly select the desired file, go to the file’s location (in file explorer). Hold the “SHIFT” key and right click on the file, then select the “Copy As Path” option. Paste that URL into the input field where it says “Enter URL Here...” depending on the type of file selected. *Important, make sure to delete all quotation marks (“”) and replace the backslashes (\) with forward slashes (/). If this is not done, errors will occur at runtime.

Video Player

In the VR video player, the video will run on the PC and is controllable from there regardless if the headset is running or not. The video player plays either regular mp4 videos or stereoscopic mp4 videos. The smaller the video file, the more efficient the performance. When the scene loads, the video and audio is automatically paused. When the headset is disconnected, the mouse controls the movement of the video, when the headset is connected, the mouse does not affect the movement of the video. There is no menu in view by default, to bring it up press the space bar. When the menu is onscreen, the mouse stops controlling the rotation of the video.

The menu has various functions implemented, these functions include buttons and a horizontal scroll bar:

Play Button: Plays the video and audio.

Pause Button: Pauses the video and audio.

Restart Button: Restarts the video and audio.

Rewind Button: Rewinds the video and audio by 5 seconds.

Forward Button: Skips the video and audio forwards by 5 seconds.

Exit To Menu Button: Exits to “Main Menu”.

Horizontal Scroll Bar: Adjusts the balance of the selected audio, no function if no audio file was selected.