Independent Project

2016 Fall – 6901A

VR Personal Webpage

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Abstract

With a rapid growth in technology over the past few years, we’re sure that the web design trends will focus on maturing and expanding on novel developments. Virtual Reality (VR) is a related technology expected to shake the gadget world. Without downloading apps with VR effect, a website is much easier for user to approach. My aim is to establish a personal webpage that can be displayed in VR mode, just with the support of an Android device and a Google cardboard.

1. Introduction

Virtual reality technology is getting increasingly popular nowadays. This trend leading to some apps, games and videos that are in VR mode appear. And some even needs buy expensive devices such as Oculus Rift, Gear VR, and HTC Vive etc. Therefore, in my project, I want to bring web into the virtual reality world with Google cardboard, which means users will not have to install anything or spend hundreds of dollars on a VR headset. Moreover, I want to apply VR into a more useful way, since a large number of VR applications are of none meaning and just for fun.

2. Design

My idea is to implement a personal page that can be viewed in VR mode, and have some interaction with the visitors. There are several parts of the display stage (e.g. education background, internship, interest and gallery etc.).

There are two modes of the webpage, visitors can either VR mode or regular mode that do not need Google cardboard. When choose VR mode, the page requires visitors to put their mobile devices (android or iPhone should be all right) into Google cardboard. If choose do not
choose VR mode, the page can be controlled by mouse or touch the mobile screen.

In VR mode, visitor could see the stereo effect, and move around to see the whole page.

Background image is a HKUST’s panorama, which represent the university that I am currently studying.

Categories are displayed in image format. There is a point in the central of the screen, which acts as a cursor to select categories. The pointer’s color becomes green when it aims at some elements that have something more to show. When visitors click on the small elements that shown around the middle part, there will be a plane to display the details of each part. There is also a “Home key” button near the author’s name, leading to the detail plane faded.

3. Features and Implementation
3.1 Features
This personal webpage have two modes and 4 parts together with a home page display. The page can both manipulate by mouse and device orientation.
3.1.1 Mobile device mode

Figure 1 is the entering display phase for the page that visited by PC web browser, such as Chrome. There is a small icon of “VR” mode in the right bottom corner. If visitors do not press that icon, and rotate the device, the page will not be showed in stereo type but still can do the same operation.
Figure 2 Press the VR icon

Figure 2 is when visitors press the “VR” icon, and it becomes VR mode. Visitors need to put the device into Google Cardboard to get correct effect.

Figure 3 Aim at elements

Figure 3 is when visitors aims at elements, such as ”education”, the central cursor will become green and the elements will also get slightly larger.
Figure 4 Education part

Figure 4 is when visitors aims at “education” for several second, there will appear a plane in the center to show the details of education part.

Figure 5 Internship part

Figure 5 is the Internship part, and just include the companies’ names because of area limitation.
Figure 6 Interest part

Figure 6 is the interests part, including technical preference and daily regular interests.

Figure 7 Gallery part

Figure 7 is the gallery part. And when visitors want to go back to the start phase, just aim at the “home” icon in the right bottom side of the name, the plane will disappear.
Figure 8 is the back side of the webpage. It’s the UST’s beautiful sea views.

3.1.2 PC Chrome mode

Figure 9 is when the website is opened by web browsers on computer. There is also a “VR” mode icon in the right bottom corner, and when
press that, the page enter full screen mode, and can rotate the “camera” use mouse.

Figure 10 VR mode on PC

Figure 11 Education part for PC
Figure 12 Internship part for PC

Figure 13 Interest part for PC
Figures 10-15 are the PC mode of the website, the content is the same as the previous mobile mode, the adaption of mobile device and web browsers on computers works fine.
3.2 Implementation
VR personal website is made based on WebGL, which combines OpenGL with web technologies. And this project also uses Three.js and A-Frame for better implement and design. The main code language is JavaScript.

3.2.1 Tools Used
WebGL is the basic standard in this project. Three.js is the main library I used to easier establish renders, 3D libraries etc. MAMP is the local web server to test webpage. Chrome is the browser which support webGL and tests local webpage on mobile. Visual Studio Code is the code editor that I used to write scripts.

3.2.2 Resources
- The website’s sprites are from https://www.sitepoint.com/bringing-vr-to-web-google-cardboard-three-js/. It is really helpful to bring me into a virtual reality world.

4. Conclusion
This project succeeded in reaching the goal of creating an interesting platform to display a personal webpage, instead of traditional format. And it also shows that VR effect can be implement in web version instead of installing specific apps, which make it easier for users to approach.

Other goal of this project was to learn some new area of web technology and JavaScript as well. This goal is also reached. Furthermore, it brings me to a stereo world and a forthcoming field of web development trend, and in the future I think it will be very helpful.
to my further studies.

5. Appendix

5.1 Minutes of the 1st meeting

Date: Thursday, 29 Sep 2016
Time: 2:20 pm
Place: Room 3512
Attending: Prof. Rossiter, ZHANG Yue
Absent: None
Recorder: ZHANG Yue

Approval of minutes  The minutes of the last meeting were approved without amendment.

Report on Progress  Searched for the possibility of apply VR to website. Learned basic three.js background knowledge and established a small test page.

Discussion Items and Things to Do  Changed the theme a little bit to 13 weeks’ time limit. Apply VR to a more useful way.

Meeting adjournment  The meeting was adjourned at 2:35 am

5.2 Minutes of the 2nd meeting

Date: Saturday, 29 Oct 2016
Time: 5:00 pm
Place: Room 3512
Attending: Prof. Rossiter, ZHANG Yue
Absent: None
Recorder: ZHANG Yue

Approval of minutes  The minutes of the last meeting were approved without amendment.

Report on Progress  Established a basic site that have stereo effect on PC web browser but not in mobile devices, mobile device orientation cannot work.

Discussion Items and Things to Do  Test to accomplish VR stereo effect on android devices with cardboard.
Meeting adjournment The meeting was adjourned at 2:10am

5.3 Minutes of the 3rd meeting
Date: Friday, 18 Nov 2016
Time: 2:00 pm
Place: Room 3512
Attending: Prof. Rossiter, ZHANG Yue
Absent: None
Recorder: ZHANG Yue
Approval of minutes The minutes of the last meeting were approved without amendment.
Report on Progress Have finished the most part of the whole website design, device orientation works fine, there still existed stereo problem however.
Discussion Items and Things to Do Refer to one previous project which also has stereo design, figure out how things are displayed in a stereo way, such as the more further the more likely with each eyes.
Meeting adjournment The meeting was adjourned at 2:20am

5.4 Minutes of the 4th meeting
Date: Monday, 12 Dec 2016
Time: 6:55 pm
Place: Room 3512
Attending: Prof. Rossiter, ZHANG Yue
Absent: None
Recorder: ZHANG Yue
Approval of minutes The minutes of the last meeting were approved without amendment.
Report on Progress Have finished the whole website design, can be enhanced more on future.
Discussion Items and Things to Do Although there remains small problems, the main part works fine
Meeting adjournment The meeting was adjourned at 7:05am