# 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.
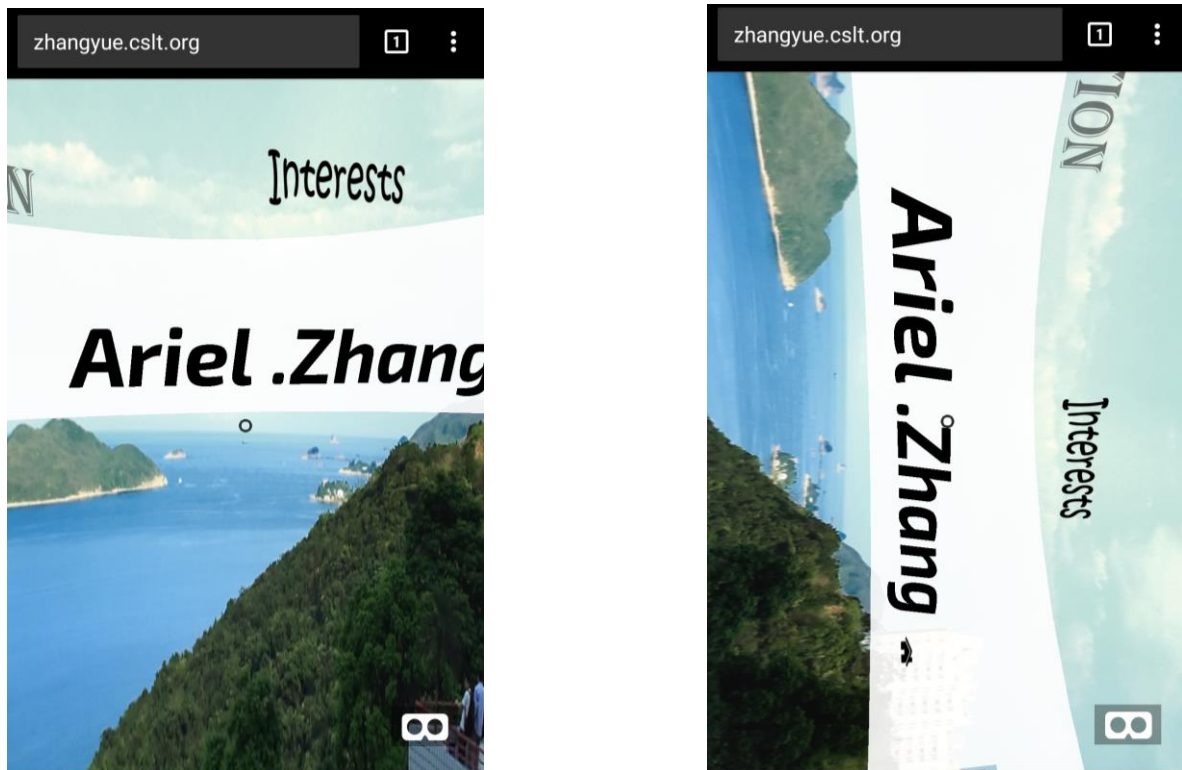
### 3.1.1 Mobile device mode



*Figure 1 Mobile Enter phase*

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.
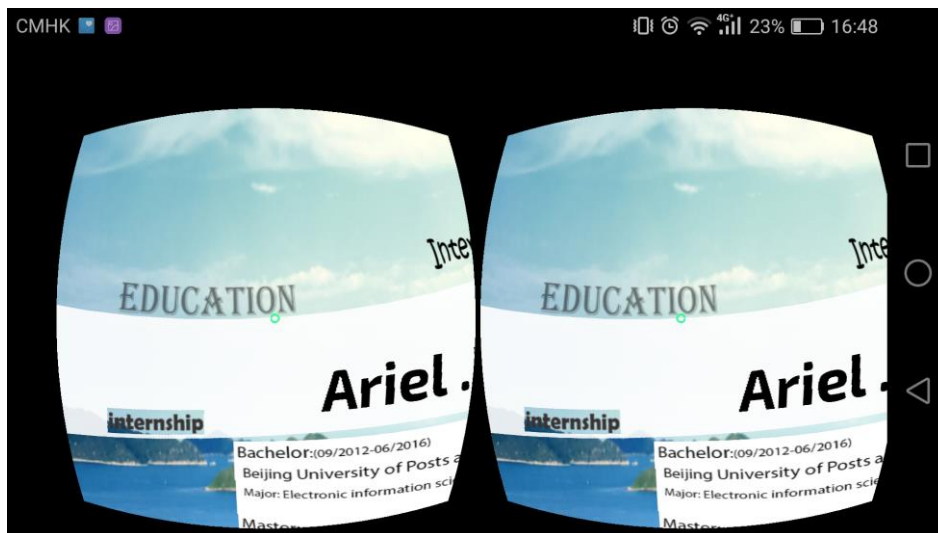


*Figure 3 Aim at elements*

 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.
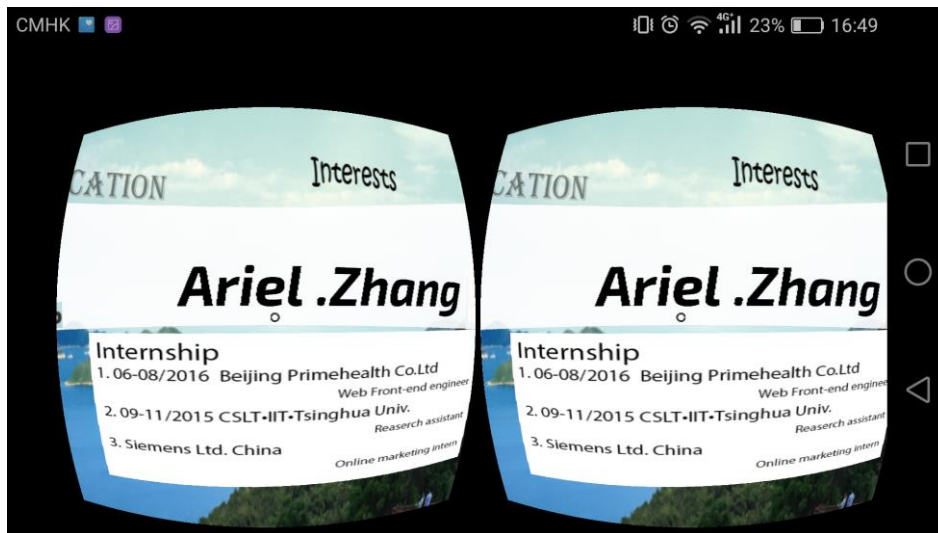


*Figure 5 Internship part*

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.
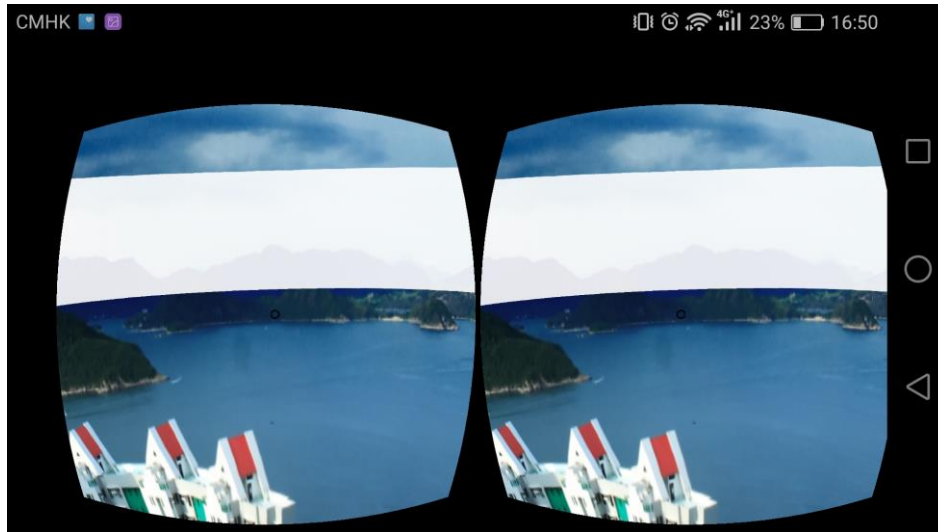
*Figure 8 Back side of the page*

Figure 8 is the back side of the webpage. It's the UST's beautiful sea views.

## 3.1.2 PC Chrome mode
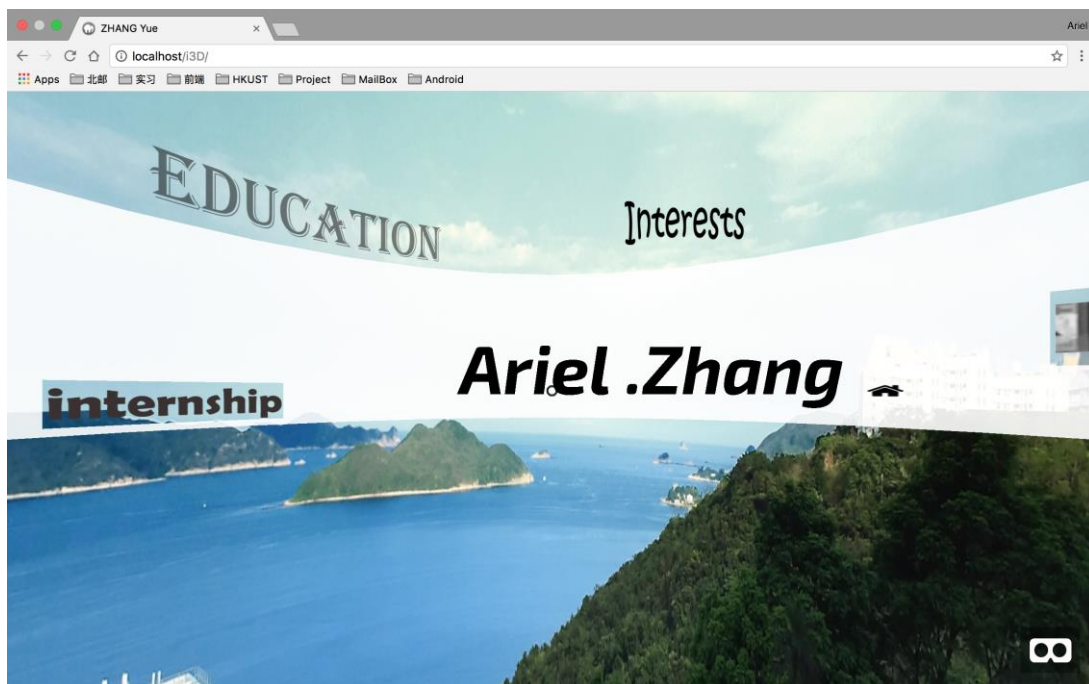


*Figure 9 PC enter phase*

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*
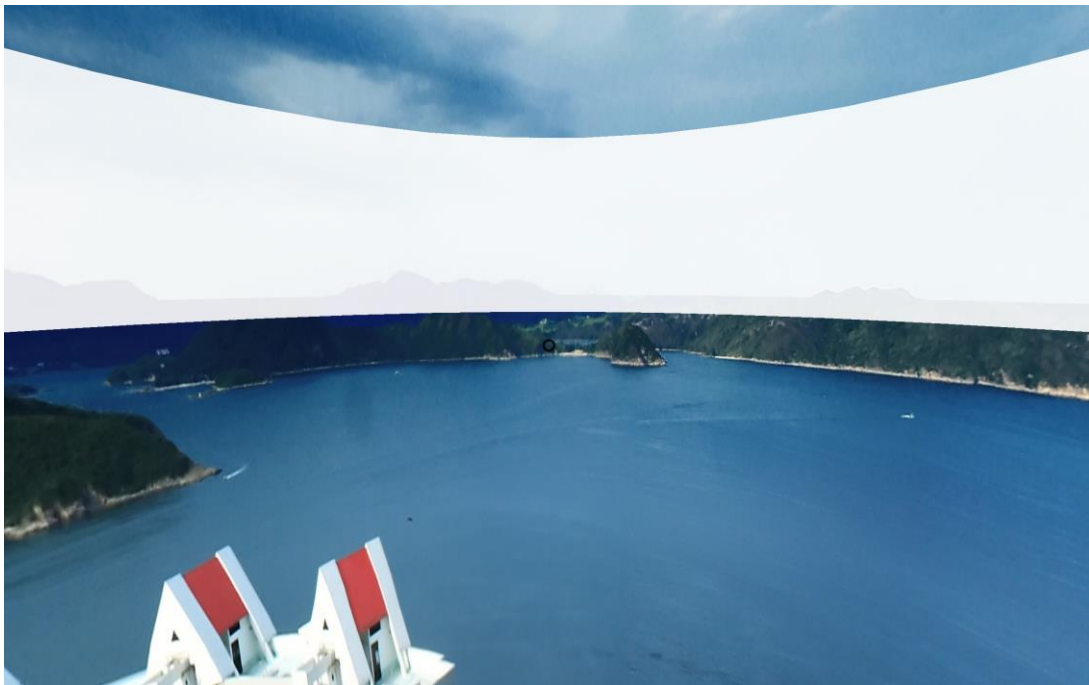
*Figure 14 Gallery part for PC*


*Figure 15 Back 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.

### 3.2.1ToolsUsed

**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.
- Lots of demos on https://threejs.org/ gives me more ideas. And https://threejs.org/docs/index.html - Manual/Introduction/Creating_a_scene is a great reference.

# 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 2:35am


## 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 3<sup>rd</sup> 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 4<sup>th</sup> 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